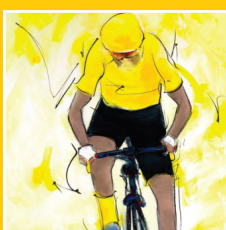
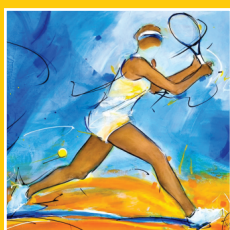


Physical EDUCATION

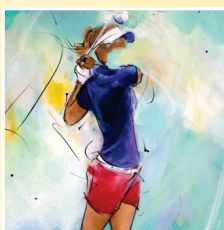
Class XI



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Physical EDUCATION

Class XI



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Physical Education

Class-XI

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THE CONSTITUTION OF INDIA

PREAMBLE

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a ¹[SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC] and to secure to all its citizens :

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity; and to promote among them all

FRATERNITY assuring the dignity of the individual and the² [unity and integrity of the Nation];

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

1. Subs. by the Constitution (Forty-Second Amendment) Act, 1976, sec. 2, for "Sovereign Democratic Republic" (w.e.f. 3.1.1977)

2. Subs. by the Constitution (Forty-Second Amendment) Act, 1976, sec. 2, for "unity of the Nation" (w.e.f. 3.1.1977)

THE CONSTITUTION OF INDIA

Chapter IV A

FUNDAMENTAL DUTIES

ARTICLE 51A

Fundamental Duties - It shall be the duty of every citizen of India-

- (a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;
- (b) to cherish and follow the noble ideals which inspired our national struggle for freedom;
- (c) to uphold and protect the sovereignty, unity and integrity of India;
- (d) to defend the country and render national service when called upon to do so;
- (e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;
- (f) to value and preserve the rich heritage of our composite culture;
- (g) to protect and improve the natural environment including forests, lakes, rivers, wild life and to have compassion for living creatures;
- (h) to develop the scientific temper, humanism and the spirit of inquiry and reform;
- (i) to safeguard public property and to abjure violence;
- (j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;
- ¹(k) who is a parent or guardian to provide opportunities for education to his/her child or, as the case may be, ward between age of six and fourteen years.

1. Ins. by the constitution (Eighty - Sixth Amendment) Act, 2002 S.4 (w.e.f. 12.12.2002)

भारत का संविधान

उद्देशिका

हम, भारत के लोग, भारत को एक सम्पूर्ण ¹प्रभुत्व-संपन्न समाजवादी पंथनिरपेक्ष लोकतंत्रात्मक गणराज्य बनाने के लिए, तथा उसके समस्त नागरिकों को:

सामाजिक, आर्थिक और राजनैतिक न्याय,
विचार, अभिव्यक्ति, विश्वास, धर्म

और उपासना की स्वतंत्रता,
प्रतिष्ठा और अवसर की समता

प्राप्त कराने के लिए

तथा उन सब में व्यक्ति की गरिमा

²और राष्ट्र की एकता और अखंडता

सुनिश्चित करने वाली बंधुता बढ़ाने के लिए

दृढ़संकल्प होकर अपनी इस संविधान सभा में आज तारीख 26 नवम्बर, 1949 ई० को एतद्वारा इस संविधान को अंगीकृत, अधिनियमित और आत्मार्पित करते हैं।

1. संविधान (बयालीसवां संशोधन) अधिनियम, 1976 की धारा 2 द्वारा (3.1.1977) से “प्रभुत्व-संपन्न लोकतंत्रात्मक गणराज्य” के स्थान पर प्रतिस्थापित।
2. संविधान (बयालीसवां संशोधन) अधिनियम, 1976 की धारा 2 द्वारा (3.1.1977) से “राष्ट्र की एकता” के स्थान पर प्रतिस्थापित।

भाग 4 क

मूल कर्तव्य

51 क. मूल कर्तव्य - भारत के प्रत्येक नागरिक का यह कर्तव्य होगा कि वह -

- (क) संविधान का पालन करे और उसके आदर्शों, संस्थाओं, राष्ट्रध्वज और राष्ट्रगान का आदर करे;
- (ख) स्वतंत्रता के लिए हमारे राष्ट्रीय आंदोलन को प्रेरित करने वाले उच्च आदर्शों को हृदय में संजोए रखे और उनका पालन करे;
- (ग) भारत की प्रभुता, एकता और अखंडता की रक्षा करे और उसे अक्षुण्ण रखे;
- (घ) देश की रक्षा करे और आह्वान किए जाने पर राष्ट्र की सेवा करे;
- (ङ) भारत के सभी लोगों में समरसता और समान भ्रातृत्व की भावना का निर्माण करे जो धर्म, भाषा और प्रदेश या वर्ग पर आधारित सभी भेदभाव से परे हों, ऐसी प्रथाओं का त्याग करे जो स्त्रियों के सम्मान के विरुद्ध हैं;
- (च) हमारी सामासिक संस्कृति की गौरवशाली परंपरा का महत्त्व समझे और उसका परिरक्षण करे;
- (छ) प्राकृतिक पर्यावरण की जिसके अंतर्गत वन, झील, नदी, और वन्य जीव हैं, रक्षा करे और उसका संवर्धन करे तथा प्राणी मात्र के प्रति दयाभाव रखे;
- (ज) वैज्ञानिक दृष्टिकोण, मानववाद और ज्ञानार्जन तथा सुधार की भावना का विकास करे;
- (झ) सार्वजनिक संपत्ति को सुरक्षित रखे और हिंसा से दूर रहे;
- (ञ) व्यक्तिगत और सामूहिक गतिविधियों के सभी क्षेत्रों में उत्कर्ष की ओर बढ़ने का सतत प्रयास करे जिससे राष्ट्र निरंतर बढ़ते हुए प्रयत्न और उपलब्धि की नई उंचाइयों को छू ले;
- ¹(ट) यदि माता-पिता या संरक्षक है, छह वर्ष से चौदह वर्ष तक की आयु वाले अपने, यथास्थिति, बालक या प्रतिपाल्य के लिये शिक्षा के अवसर प्रदान करे।

1. संविधान (छयासीवां संशोधन) अधिनियम, 2002 की धारा 4 द्वारा प्रतिस्थापित।



PREFACE

Physical education refers to Education through physical activities “to achieve all round development of an individual”. And for achieving this aim, the objectives must include -

- physical development
- cognitive development
- social development
- emotional development and
- development of motor skills of the learner.

Physical Education has moved from being an extra-curricular part of school syllabus to being an integral part of the curriculum since UN convention on the rights of the child on May 1st 1989, brought in through article 31 “The child’s right to play”. In India, too, with the focus on “Swasth Bharat”, the primary thrust is on wellness, preventive health care and awareness. This makes it essential that physical fitness issues are addressed at different levels of schooling. With this objective, CBSE has made Physical Education compulsory in its schools to train children for a healthier lifestyle.

A sound Sports Policy must regulate the implementation of school sport consistently for all learners, irrespective of ability, across all schools in an age appropriate way based on the principle of equity. This policy applies to all the schools affiliated to CBSE. Keeping in mind the need for inclusion and the right for each child to good health, there is a chapter on Physical Education and Sports for Children with Special Needs that deals with the meaning and importance of adapted physical education and the role of special educators for Children with Special Needs (CWSN).

As an essential part of education, Physical Education helps the learners acquire skills that improve their performance, sharpen knowledge of strategy and tactics, and helps them to transfer knowledge from one context to another, including sport and recreational and outdoor activities. Participation in Sports and Games builds confidence, teaches the necessary knowledge and skills for working with and relating to others, and provides the learning opportunities to develop skills like qualities of leadership and teamwork skills. This learning is transferred to other learning areas, when, for example, students cooperate and work together in groups in other



subjects in the school setting and in their lives outside of school. As students learn 'in, through, and about' movement, they gain an understanding that movement is integral to human expression and can enhance their lives. By demonstrating the benefits of an active life style, they encourage others to participate in sports, dance, exercise, recreation, and adventure pursuits.

Physical Education provides a solid foundation for preparing our citizens to live healthy life by involving in active lifestyle and also helps to prepare a base of a pyramid where excellence is at the top. It provides a pathway into the many careers that involve working with people, such as education, health, justice, and the social services.

As a subject of study, this textbook of Physical Education highlights a holistic understanding of health, focussing on the importance of exercise, games and sports, nutrition and the environment. This book also discusses the psycho-social and mental health related issues of not just sportspersons, but also children at large and collective responsibilities for healthy community living.

About the Book

The Handbook of Physical Education has a **goal-oriented, activity-based and investigative approach**. Learning Outcomes are laid out before each chapter listing the desired goals the learner must imbibe in each lesson. Learning Outcomes are assessment standards indicating the expected levels of learning that children should achieve for that Lesson. These outcomes can be used as check points to assess learning and would help teachers to understand the learning levels of children in their respective classes individually as well as collectively.

Holistic Learning refers not only to an all-round development of the learner, but also to a cross-curricular approach. It also means learning must be related to life. The **Discussion section** that precedes each chapter encourages the learner to examine existing knowledge and to relate what he is learning to his/her life. The learning thereby becomes more meaningful to the child.

Physical education engages and energises students. It provides authentic contexts in which to learn. Given the **multidisciplinary nature of this subject**, cross references have also been integrated into the curriculum. There is a chapter on Anatomy and Physiology and on Psychology. Students challenge themselves to develop their physical and interpersonal skills.





The approach towards learning is **Experiential or learning through experience**. This is distinct from rote or didactic learning, in which the learner plays a comparatively passive role. Experiential learning entails a hands-on approach to learning that moves away from just the teacher at the front of the room imparting and transferring their knowledge to students. It makes learning an experience that moves beyond the classroom and strives to bring a more involved way of learning. **Extension Activities** are an integral part of the Book and students learn as they research, conduct surveys, debate, discuss, write and draw cartoons and design posters. They experience movement and understand the role that it plays in their lives. Additional information has been given in a box in the **Do You Know** Section which provides some input, thereby encouraging students to research and acquire additional information.





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- ◆ Concept of Doping and its disadvantages

UNIT 1

CHANGING TRENDS AND CAREERS IN PHYSICAL EDUCATION



Content

Concept, Aims & Objectives of Physical Education

Development of Physical Education in India - Post Independence

Changing Trends in Sports- playing surface, wearable gears and sports equipment, technological advancements

Career Options in Physical Education

Khelo-India and Fit-India Program





Learning Outcomes

At the end of this unit, you will be able to:

- ◆ Recognize the concept of Physical Education
- ◆ Identify the aims and objectives of Physical Education
- ◆ Explore historical aspect of Physical Education in India
- ◆ Recognize various changing trends in sports
- ◆ Explore different career options in the field of Physical Education
- ◆ Understand Khelo India and Fit- India Programme



Discussion

Read the newspaper clipping given below

CBSE Makes Physical Education Compulsory in Schools

New Delhi: Central Board of Secondary Education (CBSE) has introduced a streamlined and well- designed Health and Physical Education Programme to mainstream health and physical education in schools especially for students of classes 9 to 12. This Programme will be introduced from next session and will be compulsory for all affiliated schools of the Board.

"CBSE has decided to mainstream Health and Physical Education for classes IX to XII with the aim of holistic development of the child, leading to a well-balanced individual in all walks of life," said a statement from the board.

"The aim of mainstreaming Health and Physical Education is also to enable the students to attain an optimum state of health. Therefore, CBSE aims to provide a focussed curriculum for Health and Physical Education imbued with Life Skills in all its affiliated schools," the statement added.

Keeping this in view, CBSE has asked schools that while preparing timetable for session 2018-19, one period every day may be reserved for Health and Physical Education especially for class 9 to 12 from session 2018-19 onwards.

Discuss in your group

- ◆ What do you think CBSE's Health and Physical Education Programme includes?
- ◆ Why has CBSE decided to make Health and Physical Education Programme compulsory for schools?
- ◆ Do you think school students are in need of such a Programme? Why/ Why not?
- ◆ Why is the Programme aimed especially for class 9 to 12?
- ◆ If you were to design the Programme, what features would it include? Why?

Present your ideas to the class.



1.1 MEANING OF PHYSICAL EDUCATION

If a survey was to be conducted and individuals asked what they understood when they heard the term Physical Education, the response could possibly be that physical education is knowledge related to sports activity, sports education, sports coaching, health education, education about yoga or anything related to individual fitness.



But is this really Physical Education? Not totally. Physical Education is all of the above and something more. While the above-mentioned activities are associated with Physical Education, they are not all that Physical Education is about. In an essence Physical Education uses physical activity or movement to bring about positive changes in the physical, mental, and emotional make-up of an individual. It is a broad field of education which deals with the relationship between physical wellbeing and movement and other domains of education.

Physical Education is a combination of two separate words, physical and education. The first word is physical which means related to body or related to any one or all of the bodily characteristics, that include physical strength, physical endurance, physical fitness, physical appearance and physical health. And, the second word is education which means preparation for life or systematic instruction and training.

When we look at the combined meaning of these two words, we can understand that physical education is a systematic training of an individual by using his/her own body to achieve the objectives of developing and maintaining the body, developing motor skills and physical abilities, making a habit of living a healthy lifestyle and developing the ability to control emotions for a fuller living.

In the modern context, Physical Education lays a strong emphasis on achieving overall fitness and wellbeing rather than only physical fitness through body movement. In fact, Physical Education is now called movement education. It indicates how the body moves to develop efficient motor activity.

Movement is basically governed by mechanical principles. A person must know the forces that act on the body in movement so that the movement is meaningful. Movement is affected by diverse factors such as physical fitness, emotional aspects pertaining to fear and anxiety and, even, atmospheric changes.

Movement is integral to all human beings. It includes both locomotor movement skills, such as running, jumping etc., which are necessary movements, and non-locomotor movements like twisting, turning etc. Movement is also a means of communication. In movement education, individuals have the freedom of self-exploration and are encouraged to find their own solutions to problems involving movements. They choose methods that are best suited to their abilities and perform movements that they desire. In movement education classes, students are given the freedom to follow their own methods of movement.

It is, therefore, essential the curriculum followed in the Physical Education Programme focuses on the overall fitness of a human being which is the need of today's youth and of the country as well, educating individuals to value their overall fitness by suggesting to them how can they improve and assess it.

Do you know?

There are two types of movements Locomotor and Non- locomotor.

- Movement such as walking, running, hopping, leaping, skipping, galloping are examples of locomotor movements.
- Movements such as stretching, twisting, turning, pushing, pulling and swinging are non-locomotor movements.

1.1.2 DEFINITION OF PHYSICAL EDUCATION

Physical Education is more than sports education. Let us see how some eminent scholars have defined Physical Education.

Physical Education is the sum of those experiences which come to the individual through movement.
-Delbert Oberteuffer

Physical Education is an integral part of the total educational process. It is a field of endeavour that has as its aim the improvement of human performance through the medium of physical activities that have been selected with a view to realizing this outcome.-
Charles A. Bucher

Physical Education is the sum of man's physical activities selected as to kind, and conducted as to outcomes.
-Jesse Feiring Williams

Physical Education is that phase of the whole field of education that deals with the big muscle activities and their related responses.
-Jay B. Nash

To sum up, Physical Education is a process of education which aims at the holistic development of an individual by using physical activity or body movement.

So, in a broader context, Physical Education may be defined as a teaching-learning process where physical activities are used as medium of instruction, and these physical activities are designed in such a manner as to improve physical fitness, motor skills, knowledge, sportsmanship, emotional stability and healthy behaviour.

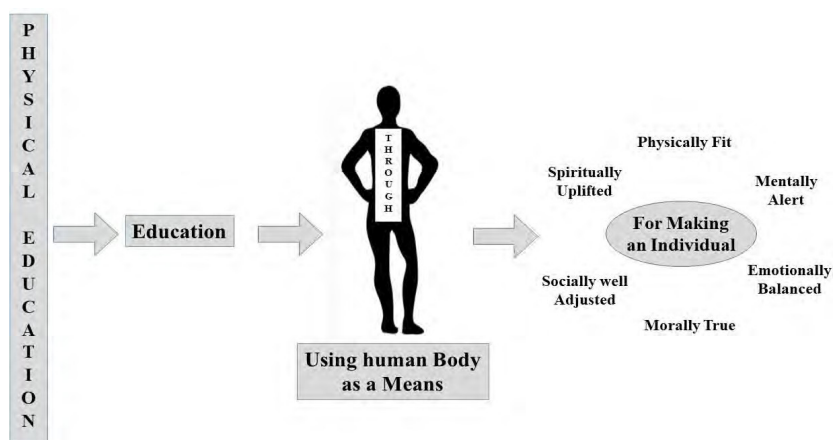


Figure: An illustration of Physical Education





1.1.3 AIM AND OBJECTIVES OF PHYSICAL EDUCATION

Physical Education is “education through movement”. It aims to maximize our physical ability, leading us to be healthy, knowledgeable, skilful, creative, productive and influential in all walks of life. Thus, the aim of Physical Education is the optimal and wholesome development of the individual for complete living, as well as optimum performance in sports competitions. According to National Plan of Physical Education and Recreation, “The aim of Physical Education must be to make every child physically, mentally and emotionally fit and also to develop in him such personal and social qualities as will help him to live happily with others and build him up as a good citizen.”

Do you know?

From April 2019, CBSE has made Health and Physical Education period compulsory for Classes 1st to 8th on an everyday basis.

Aim

Optimum and wholesome development of individual for complete living, *as well as optimum performance in sports competitions.*



Objectives

Value Physical Education
Develop Interest in the Discipline
Achieve Optimum Physical Fitness & Health
Awareness of Movement
Organic Development
Neuro-muscular Co-ordination
Emotional Development
Social Development
Develop Motor Skills
Enjoyment and Satisfaction
Development of Evaluative Skills
Interpretive Development
Moral & Character Building
Remedial Values
Optimum Sports Performance
Effective Citizenship

Extension Activity

Take part in any form of physical activity for one week (the activity can be any sports, simple jogging/walking, recreational activity, adventure sports etc.). After a week fill the table given below.

- Name of the Activity.
- What motivated you to choose this activity?
- How do you feel after participating in this activity?
- Would you like to continue participation in this activity?
- If your response to the above question is 'Yes' or 'No' give a plausible reason.



Objectives

1. **Value of Physical Education:** The chief objective of Physical Education is to make individuals aware of and appreciate the value of Physical Education and its contribution to a healthy and active lifestyle.
2. **Develop interest in the discipline:** The focus of a well-designed Physical Education plan should be to encourage a high level of interest and personal engagement in Physical Education showing initiative, enthusiasm and commitment towards the same.
3. **Achieve Optimum Physical Fitness and Health:** Physical Education Programmes should aim to develop an individual's physical fitness and to make her/him work to her/his optimal level of physical capacity. It also aims to develop healthy habits of sleep, exercise, food etc. for optimum health.
4. **Awareness of Movement:** The Physical Education Programme should make the individual realise that movement is a creative medium for communication, expression and aesthetic appreciation. Proficiency in fundamental movement skills through Physical Education supports the development of more specific skills such as dance.
5. **Development of Organ Systems:** The objective of Physical Education Programme is to develop all organ systems such as respiratory system, circulatory system, digestive system, nervous system, and muscular system. This leads to increased physical efficiency and capacity.
6. **Neuro-muscular Co-ordination:** The Physical Education Programme should be planned in such a manner that it helps in maintaining a better relationship between the nervous system and the muscular system. This helps in developing control and balance among different body parts.

Do you know?

According to National Planning of Physical Education and Recreation, the 'aim of Physical Education must be to make every child physically, mentally and emotionally fit and also to develop in him such personal and social qualities as will help him to live happily with others and build him up a good citizen'.

7. **Emotional Development:** Competitions are an indispensable part of sports and games and are marked by success and failure. Physical Education helps develop emotional stability and teaches acceptance of success and failure gracefully. These qualities are helpful throughout one's lifetime. Different situations occur on the sports field whereby individuals learn to control emotions such as anger, pleasure, jealousy, fear, loneliness etc. This makes them emotionally balanced.





8. **Social Development:** Physical Education leads to social development as it provides the individual ample opportunities for social contact and group living which help her/him to adjust in different situations and build relationships. Qualities like cooperation, obedience, fair play, sacrifice, loyalty, sportsmanship, self-confidence are developed. Development of these traits help the individual to become a good human being and also results in a healthy society.
9. **Develop Motor Skills:** The Physical Education Programme helps the individual develop the motor skills necessary for successful participation in different sports and a variety of other physical activities.
10. **Enjoyment and Satisfaction:** A Physical Education Programme provides enjoyment and satisfaction through physical activity.
11. **Development of Evaluative Skills:** A well-designed Physical Education Programme helps participants to show knowledge and understanding of a variety of physical activities and to evaluate their own and others' performances.
12. **Interpretive Development:** Physical Education helps develop interpretive ability amongst the individuals where they can critically reflect upon physical activity in both their local and intercultural context.
13. **Character Building:** A well-structured Physical Education Programme should be based on desirable life outcomes like building character traits such as morality, self-esteem, self-efficacy and resilience, including lowering levels of stress, experiencing positive growth, boosting academic achievement, being willing to set challenging life goals, and pro-social behaviour.
14. **Remedial Values:** Physical Education Programme teaches safety habits where one can learn about corrective exercises which will lead to safety habits amongst individuals.
15. **Optimum Sports Performance:** Physical Education brings an individual to optimum sports performance level.
16. **Effective Citizenship:** At last but not the least, the Physical Education Programme prepares an effective citizen who serves the country in better manner.

I. **Tick the correct option.**

1. In Jesse Feiring Williams's definition of Physical Education, "Physical Education is the sum of man's physical activities selected as to kind, and conducted as to outcomes," the phrase 'activities selected as to kind' refers to activities that are
 - i. based on desired outcomes
 - ii. based on physical activities



- iii. based on expected outcomes
 - iv. based on planned outcomes
2. Physical Education uses the body as a means to exhibit our feelings which develop the quality of
- i. expression
 - ii. creativity
 - iii. emotional stability
 - iv. Intellectuality
3. Amongst the following which one is the key process in Physical Education?
- i. Evaluating performance
 - ii. Checking competency
 - iii. Making efforts
 - iv. Developing skills
- II. Answer the following questions briefly.
- 1. Define Physical Education.
 - 2. How Physical Education develop neuro-muscular coordination?
 - 3. How can Physical Education contribute in moral and character building?
- III. Answer the following questions in 150-200 words.
- 1. How does Physical Education contribute to an individual's development?
 - 2. What is the modern concept of Physical Education?
 - 3. Charles A. Bucher defined Physical Education as "Physical Education is an integral part of the total educational process. It is a field of endeavour that has as its aim the improvement of human performance through the medium of physical activities that have been selected with a view to realizing this outcome". Elucidate this definition, and give examples how it would be interpreted in practice.
 - 4. What are the objectives of Physical Education?

1.2 DEVELOPMENT OF PHYSICAL EDUCATION IN INDIA - POST INDEPENDENCE

India progressed in all aspects after getting independence in 1947. In the field of Physical education numerous schemes were introduced by Government of India.





In 1948, Government of India was setup Central Government Physical Education Committee also known as Tara Chand Committee which recommends Central Institute of Physical Education and Recreation and improvement of standards of games and sports in India.

In 1950 Central Advisory Board of Physical Education was setup with a purpose to advise the government regarding physical education issues. One of the important objective of the board was to introduce Physical Education Subject as Compulsory subject at elementary , middle and senior secondary level. To promote indigenous physical activities, Central Advisory Board of Physical Education prepared National Plan of Physical Education and Recreation in 1956.

First Asian Games were held in 1951 at New Delhi which motivate Indian youth to participate in games and sports at International level.

Then health minister of India Rajkumari Amrit Kaur introduce Coaching Scheme for games and sports in 1953. The purpose of the scheme to streamline coaching program in Indian, since there are no professional coaching program running that time. As a result, National Institute of Sports (NIS) was setup in 1961 at Moti Bagh, Patiala, Punjab to produce qualified coaches in different games and sports.

In 1954 All India Council of Sports came into existence with a purpose to liaison between Government and National Sports Federations in order to assistant in financial matters. Under All India Council of Sports, State Sports Council and District Sports Council were established.

After 10 years of Independence in 1957, Minister of Education & Culture, Government of India established First College of Physical Education as Lakshmibai College of Physical Education (LCPE) at Gwalior, Madhya Pradesh. In 1973, Lakshmibai College of Physical Education was renamed to Lakshmibai National College of Physical Education (LNCPE). In 1995, LNCPE got status of "Deemed University" for central government under the name of Lakshmbial National Institute of Physical Education (LNPIE).

In 1958 Ministry of Education, established Sports and Youth Welfare Department to promote Physical Education in India. Ministry of Education sponsored National Physical Efficiency Drive to evaluate the physical fitness status of peoples in India in 1959.

National Fitness Corps was established in 1965 with object to make youth physically strong. In 1970-71 Rural Sports tournament scheme was introduced by the government with purpose to involve rural youth and spot natural talent in different sports. Sports Talent Search Scheme was launched to promote sportspersons of state and National level in 1970-71. To enhance women participation in sports National Sports championship was started in 1975.



In 1982, Asian Games were held in India which give huge boost in infrastructure and facilities related with sports. In 1984 Sports Authority of India (SAI) was established under the Department of Sports to maintain and proper utilization of sports infrastructure which was build for Asian Games. SAI has two objectives one is to promote sports and achieve sports excellence at national and international level.

In 1987, Society for National Institutes of Physical Education and Sports (SNIPES) was merged with Sports Authority of India (SAI) to promote and develop sports awareness among peoples. XIX Commonwealth Games 2010 was conducted in New Delhi. In 2018 CBSE launched Physical Education as Compulsory subject in class IX to XII as mainstreaming Health, Physical Education.

I. Tick the correct option.

1. Where Lakshmibai National Institute of Physical Education (LNPIE) is situated?
 - i. New Delhi
 - ii. Patiala
 - iii. Kerela
 - iv. Gwalior
2. Central Government Physical Education Committees was setup in 1948, which is also known as ?
 - a. Tara Chand Committee
 - b. Rajkumari Amrit Kaur Committee
 - c. Simon Committee
 - d. NIS committee
3. SAI Stands for:
 - a. Sports Appointment of India
 - b. Sports Academic of India
 - c. Sports Authority of India
 - d. Sports Accreditation of India

II. Answer the following questions briefly.

1. Write down few lines on different committee constituted for the purpose of development of physical Education in India after Independence.
2. Discuss the developmental process of first professional institution of physical education after independence.





III. Answer the following questions in 150-200 words.

1. Explain the Physical Education development in India after Independence.

1.3 Changing Trends in Sports- playing surface, wearable gears and sports equipment, technological advancements

1.3.1 Playing surfaces

Wider variety of playing surfaces is used for physical activity, exercise and sports. Nature of the sport, geographic location, climate, infrastructure etc. are a few of the factors which influence the nature of field utilized for playing. Grass and clay courts are highly favoured for outdoor sports due to natural availability of this play area in most of the parts of the world, but now synthetic playing surfaces are being widely used for field and court sports, artificial turf surfaces are commonly used as an alternative to natural grass and clay courts due to ease of maintenance and better sustainability under hard weather conditions like rain. Due to geographic or climatic conditions outdoor sports may not be possible throughout the year, so indoor sports facilities are also common in various parts of the world. Indoor courts and play fields mostly have artificial surfaces ranging from wooden surfaces, synthetic surfaces like rubberized or acrylic surfaces are popular.

I. Outdoor Sports

1. Athletic Jogging Track

- i. **Clay & Cinder:** These natural running outdoor tracks use a combination of fine ash, carbon and rock. The composition results in a softer surface, making them comfortable to run and jog. With the advantages, the challenge with clay and cinder track is to maintain an even surface during rain, wind etc.
- ii. **Synthetic:** The synthetic surface comprises rubber particles bound with latex or polyurethane. It also uses an asphalt or concrete base. It is common to add layers and integrate different textures in a synthetic rubber track. In modern sports, most of the running tracks use synthetic rubber for optimal traction and ideal running performance.

2. Turf

- i. **Grass and Clay:** Grass is another natural running track similar to the clay turfs discussed above. This is a soft surface which makes it easier to run because it puts less pressure on your foot. It is also low-impact, reducing the risk of injuries from overuse. Like clay and



cinder surface, grass surface is also tough to maintain and requires high amount of care.

ii. **Synthetic Sports Flooring**

- a. **Polygrass** : This is a synthetic sports playing surface especially used as an alternative to grass with similar looks but is a playing surface that is easy to maintain. Games like Football have officially approved polygrass for competitions. Polygrass is also popular for multi-utility sports at institutions and residential areas due to its durability and low maintenance.
- b. **Astroturf**: is another synthetic sports flooring especially popular for sports like hockey. Major advantage of polygrass is that the surface is even, with less friction, due to which the ball moves faster on the astroturf and movements become swifter.
- iii. **MUGA (Multi Utility Games Area)**: Kindergarten playgrounds, recreational areas, fitness and outdoor gym floorings are common in modern urban systems and at places where natural grass or clay surfaces are not possible to maintain. Modern multi utility games area (MUGA) are made of synthetic rubber, and thus have greater shock absorbency. This makes them highly safe for a wide range of activities.

II. **Indoor Sports**

1. **Courts**: Indoor courts are very popular for sports like badminton, basketball, handball, as they can be played around the year without restrictions of weather and climate. The indoor courts mostly have a synthetic or wooden surface. Sports like badminton are also played on synthetic mats laid on wooden floors.
 - i. Wooden courts
 - ii. Synthetic courts
2. **MUGA**: As discussed for outdoor sports, multi-utility games arena (MUGA) are popular at indoor sports facilities where multiple activities can be planned and organised. The rubberised surface is easy to maintain and is durable and safe.

1.3.2. Wearable Gears and Sports Equipment

With the change in technology and development of sports sciences, equipment used in sports has undergone modifications in material, shape, size and weight. Along with change in sports equipment, various wearable gears and devices in sports





virtually touch every aspect of an athlete's preparation for sports participation. The modifications in sports equipment and introduction of modern wearable gears help athletes improve performance, prevent injury, help officials deliver correct and fast judgments and, surely with media coverage of athletes, the wearable equipment provide improved aesthetics. Lets discuss them according to their purpose:

1. **Safety** : Change in quality of sports helmets make them lighter and stronger to take the impact of ball. Gloves and guards are also made of modern materials to give extra protections to the players.
2. **Performance**: With the change in design, new attire, like modern swimsuits, are used to counter friction and improve performance. The designs of boots and footwear are aerodynamically designed to improve movement efficiency of athletes.
3. **Monitoring & Judgement**: Wearable gears like GPS and other devices to measure body chemistry and physiological status are of great advantage for athletes and coaches to monitor the performance of athletes and help take remedial actions.
4. **Aesthetics**: Activity wears and trendy athletic clothing and apparel used by top athletes as well as exercise or fitness enthusiasts. Top class athletes do adopt trendy wear due to media coverage and sports marketing playing an important role in sports promotion and sponsorships. Even fitness enthusiasts prefer aesthetically designed activity wear and fitness gear, as it gives them self-confidence and promotes image-boosting.

1.3.3. Technology in sports

In modern life, technology is a great tool in making life easy and comfortable. Technological advances have greatly affected sports science and other areas of life. As the market for the sports industry has expanded, alongside its growing popularity, demand for technological study has increased. Today no sports or athletics is untouched with the engagement and integration of technology, either for officiating, performance analysis or for safety and mechanical analysis. Let's try to understand the importance of technology in sports.

1. **Officiating technology**
 - LED lights are used in various sports like cricket where they help officials to identify and take correct decisions. In cricket, LED lights are used in stumps to decide on the status of the ball hitting the stumps.
 - Infra-red technology is used to help officials take decisions in various sports, 'Hot spot' is a infra-red imaging system which lets umpires and commentators see if the bat has struck the ball.



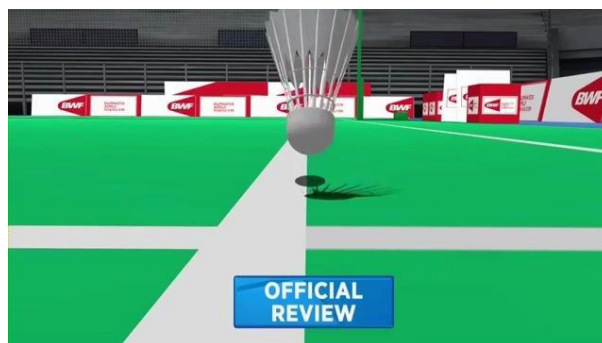
- Video technology is used in various sports like cricket, football, basketball etc wherein replays or recordings in slow motion are used to take decisions. VAR is a popular video technology used in football by the referees to take decisions during the match.
 - Laser technology is used in various games for detection of a foul and for eliminating subjective judgement of movements. 3-D laser technology is used in gymnastics for scoring of gymnasts and laser technology is also used in long and triple jump take-off boards to identify foul jumps.
2. **Protective equipment** : Technologically advanced materials to produce safer and more comfortable protective gear which enable sportspersons to play at their peak without compromising their safety, like helmets for cricketers.
 3. **Timing system**: GATES, laser or touch sensors can be used to provide the most precise race time possible. These timing systems also provide incredibly exact measurement down to the thousandth of a second, which eliminates rounding errors.
 4. **Location Tracking System** : Global Positioning System technology is being used in training and in competitive sport, including in preparation exercises as well as during play. By using Tracking System devices, teams can track the movement of players at the pitch and collect large amounts of data about their performance. The system is also now introduced in sports stadium to manage spectators and crowds during mega sports events.
 5. **Biomechanical and Movement analysis software** : These are integrated with video recording or live video of sports performance and exercise movements to evaluate the quality of movement and analyse deviations of an athlete's movements with the help of scientific evidence. Sensors are also attached to sports equipment like bats, balls, rackets, footwear etc. to evaluate metrics such as swing speed, power, directionality, force etc. Force platforms or force plates are also used to measure the ground reaction forces generated by an athlete body standing on or moving across them to improve technique and errors.
-
- I. **Tick the correct option.**
 1. Which of the following is a natural playing surface?
 - a. Cinder
 - b. Astroturf
 - c. Polygrass
 - d. Wood





2. In which of the sports is LED lights technology used?
 - a. Tennis
 - b. Cricket
 - c. Badminton
 - d. Football

3. Which technology is used in following picture?



- a. VAR
- b. GATE
- c. Senso-meter
- d. GPS

II. Answer the following questions briefly.

1. Briefly explain different technologies used during officiating in Sports.
2. What do you think Wearable Gears and Sports Equipment
3. What are advantages of using technology in sports ?

III. Answer the following questions in 150-200 words.

1. Classify various playing surfaces in sports ?

1.4 VARIOUS ACADEMIC COURSES IN PHYSICAL EDUCATION

Physical Education is a fast-growing discipline in India. To educate individuals in the field of Physical Education numerous courses are offered by different educational institutions.

The National Council of Teacher Education (NCTE) has recognised the courses which prepare teachers of Physical Education for school system in India. NCTE recognises only three courses for Physical Education Teachers.

1. Diploma in Physical Education (D.P.Ed.): This course prepares Physical Education Teachers for the elementary stage of school education i.e. for Classes I to VIII.



2. **Bachelor of Physical Education (B.P.Ed):** This course is designed for preparing teachers of Physical Education for teaching theory papers in Classes VI to X and conducting Physical Education and Sports Activities for Classes XI-XII.
3. **Master of Physical Education (M.P.Ed.):** It is meant for preparing Physical Education Teachers for Senior Secondary classes (i.e. XI-XII) as well as Assistant Professors/ Directors/ Sports Officers in Colleges/Universities and Teacher Educators in Colleges of Physical Education and University Departments of Physical Education.

In addition, research-oriented courses such as Master of Philosophy (M.Phil.), Doctorate of Philosophy (Ph.D.) and Post Doctorate Fellowship (P.D.F.) Programmes are also offered in Physical Education.

Apart from this, different educational institutions in India offer various courses in Physical Education (recognised by University Grands Commission, New Delhi or by the Institutions themselves). A few of these courses are listed below:

Post Graduate Diploma Level Courses

- Post Graduate Diploma in Adventure Sports Administration
- Post Graduate Diploma in Disability Sports
- Post Graduate Diploma in Fitness Management
- Post Graduate Diploma in Sports Coaching
- Post Graduate Diploma in Sports Journalism
- Post Graduate Diploma in Sports Management
- Post Graduate Diploma in Sports Nutrition
- Post Graduate Diploma in Yoga Education

Bachelor Level Course

- Bachelor of Arts (Programme) Sports & Performance
- Bachelor of Physical Education & Sports
- Bachelor of Physical Education (Four Year Course after 12th)
- Bachelor of Science Exercise Physiology
- Bachelor of Science in Physical Education
- Bachelor of Science in Physical Education, Health Education and Sports Sciences
- Master Level Courses





- M.B.A. in Sports Management
- M.Tech. in Sports Technology
- Master of Arts in Physical Education
- Master of Arts in Sport and Exercise Psychology
- Master of Arts in Yoga
- Master of Journalism and Mass Communication (Specialization - Sports Journalism)
- Master of Physical Education and Sports
- Master of Science in Exercise Physiology and Nutrition
- Master of Science in Physical Education
- Master of Science in Sports Biomechanics and Kinesiology
- Master of Science in Sports Coaching
- Master of Science in Sports Psychology and Sociology
- Master of Science in Yoga

1.4.2 CAREER OPTIONS IN PHYSICAL EDUCATION

When an individual graduates with a professional degree in Physical Education, the most obvious career option for her/him is to work as a Physical Education Teacher (PET) at an elementary, middle, secondary or senior secondary level school. While it is true that students who study or graduate with any professional degree in Physical Education do choose this career option, it is not only career option they have.

Physical Education is emerging as a fast-growing discipline and this is reflected by the various courses offered by educational institutions situated in India. Courses from sports coaching to sports journalism have emerged as favoured career options due to growing demand in this field.

Thus, Physical Education Programmes prepare their students for careers in both, school and non-school, settings. Graduates of Physical Education have the option to work for schools, colleges, universities, sports clubs, fitness industry, health providers and many more.



Extension Activity				
Visit any search engine on internet and fill the information in table.				
Course	Name of Institution	Duration of Course	Eligibility Criteria for Admission	Career Options of the Course
D.P.Ed.				
B.P.Ed.				
M.P.Ed.				
MBA in Sports Management				

A few career options are listed below:

Physical Education Teacher: After completing D.P.Ed., B.P.Ed. or M.P.Ed., one can be appointed as PET in a school or college.

Health Education Teacher: There is one paper in the Programme of Physical Education which is completely devoted to health education. After completion of the course one can work as a Health Education teacher.

Sports Coordinator: Skills such as organizing and directing all aspects of assigned recreational sports Programmes, including coaching and teaching responsibilities, and planning team activities are taught in Physical Education courses, so one can effectively work as a sports coordinator.

Do you know?

In 1920, Harry Crowe Buck of Pennsylvania, United States, established YMCA College of Physical Education at Chennai, Tamil Nadu. This is the first Physical Education college in Asia.

Professional Coach: After a Diploma in Sports Coaching, one can be appointed as a professional coach of a team or for individuals/athletes requiring a personal coach/trainer.

Outdoor and Adventure Sports Educators: A person with a degree in any Physical Education course and interest in outdoor and adventure sports can educate others in the field.

Sports Administrator: Supervision and Administrative skills are also taught in Physical Education courses. This enables the individual to work as a sports administrator.

Provider of Recreational Services: One can run a recreational club where recreational services such as Dodge ball, Bean bags, Bob ball, etc. may be provided.





One could set up an Amusement Park for provision of adventure sports such as river crossing, rappelling, etc.

Event Manager of a Sports Club: An individual who has graduated with MBA in Sports Management can offer his/her services as an event manager at any sports club.

Health and Fitness Club Manager: One can be appointed as health and fitness club manager after having a professional degree in Physical Education as well as an interest in the field.

Sports Clothing & Equipment Designer: If one has zeal and interest in fashion designing then she/he can work as a sports clothing and equipment designer.

Dietician and Nutritionist: After graduating with any Physical Education degree, an individual can choose the profession of a dietician and nutritionist also.

Sports Goods Marketing: Sales and Marketing of sports goods is a fast-growing industry and one can choose this line after graduating in Physical Education.

Yoga Trainer: Yoga has become popular both nationally and internationally, so one who is trained in yoga can provide her/his services to instruct groups/individuals through various levels and types of yoga.

Fitness Trainer: One can work as a fitness trainer after completing any course in Physical Education.

Physical Therapist: One can also work as a physical therapist after doing any physical education Programme.

Sports Journalist: Some institutes offer a sports journalism course, so those who have graduated in this course can work as sports journalists.

Adapted Physical Education Teacher: This dimension of physical education has gained much importance in today's society, because we have come to realise the right of each and every individual on this planet to live his/her life to the fullest. In this domain, a special curriculum is designed to train individuals for taking care of the physical education needs of persons with disability.

Thus, if you have a degree in Physical Education, you have to just think about your interest and choose a career option that suits your interest.





I. Tick the correct options

1. After completing M.P.Ed. you can teach Classes
 - i. I toVIII
 - ii. I toV
 - iii. VI toVIII
 - iv. XI toXII
2. Which course of Physical Education is not recognised by NCTE?
 - i. D.P.Ed.
 - ii. B.P.Ed.
 - iii. M.P.Ed.
 - iv. B.P.E.S

II. Answer the following questions briefly.

1. What is the full form of NCTE?
2. Apart from a professional degree in Physical Education, what other key skills are required for opting for a career other than teaching?

III. Answer the following questions in 150-200words.

1. Explain different kinds of Physical Education academic courses available in India?
2. What are the career options an individual has after completion of professional course in Physical Education?

Art Integration - ROLE PLAY

Working in groups, conduct an interview for any one of the above-mentioned jobs. You will play the roles of

- Three/Four panelists who interview the candidate to determine how suitable the candidate is for a particular role.
- Two/three candidates.

As the interviewers you must try to assess the candidate's suitability and assess how the candidate (if selected) may react in difficult/problem situations. The situation will often involve some sort of controversy or conflict or dissatisfaction on the opposition's part, and require negotiating and reasoning as well as customer service skills from the interviewee. You will prepare a set of questions related to the candidate's





- educational qualifications
- previous work experience
- suitability to the position in hand.

As the candidate(s), you will prepare a portfolio related to your

- educational qualifications
- previous work experience
- suitability to the position in hand.

You must be prepared with methods of dealing with problem situations.

The other groups will watch and take notes/assess the group performing the Roleplay.

1.5 KHELO INDIA

The Khelo India Programme has been introduced to revive the sports culture in India at the grassroots level by building a strong framework for all sports played in our country and to establish India as a great sporting nation.

Participation in sports is an extremely important component for development of any nation. When we see India's performance in International sports events, it is found that India is making a steady progress and this is happening when only 5% of our total population participates in sports and games. If this percentage of participation is enhanced, then results could be different. Thus, to inspire young talent and to provide them with world-class infrastructure and training facilities, "Khelo India National Programme for Development of Sports" was launched by the Ministry of Youth Affairs and Sports, Govt. of India in the financial year 2017-2018.

Do you know?

The Khelo India Programme was approved in the Cabinet meeting of the Department of Sports, Ministry of Youth Affairs and Sports, Govt. of India, held on 20th September, 2017.

The budget allocation for the Khelo India Programme is Rs. 1,756 Crore for the period of 2017-18 to 2019-20.

The intention is to achieve the two main objectives which are mass participation and promotion of excellence in sports in the country.

1.5.1 VISION OF KHELO INDIA

The vision of the Government of India behind launching the Khelo India Programme is to further sports culture in India, especially at the grassroots level as well as achieve sporting excellence in the country.

1.5.2 MISSION

The mission of the Khelo India Programme is “to encourage sports for all thus allowing the population across gender and all age groups to harness the power of sports through its cross- cutting influence, namely, holistic development of children and youth, community development, social integration, gender equality, healthy lifestyle, national pride and economic opportunities related to sports development.”

In short, the aim of Khelo India Programme is to provide a platform to each and every citizen of India, despite their individual differences of age and gender, to participate in sports and channelize their sporting skills which ultimately leads to an all-round development of every child and youth. This will lead to community development, social integration and gender equality. It will inculcate a healthy lifestyle, bring laurels to country and provide economic opportunities.



1.5.4 AIM AND OBJECTIVES OF THE PROGRAMM

The Khelo India Programme aims at developing a sporting culture in the country, identifying talent from the grassroots, and grooming them for international success.

The intention of Khelo India Programme is to build a strong framework for each and every sport played in the country and to make India into a strong sporting nation arena. To achieve this Khelo India Programme has outlined twelve verticals namely





- Play Field Development
- Community Coaching Development,
- State Level Khelo India Centres
- Annual Sports Competitions
- Talent Search and Development
- Utilization and Creation/Upgradation of Sports Infrastructure
- Support to National/Regional/State Sports Academies
- Physical fitness of school children
- Sports for Women
- Promotion of sports amongst people with disabilities
- Sports for peace and development
- Promotion of rural and indigenous/tribal games.



1. **Play Field Development:** One-time funding of up to 50 Lakhs will be provided to States/UTs for developing, managing, equipping and maintaining playing field and sports infrastructure development and open spaces for public use by the Ministry of Youth Affairs and Sports, Government of India.



- ◆ NPFAl has been registered as a Society under Societies Registration Act, 1860 in February, 2009.
- ◆ Development of playgrounds in all gram panchayats can be taken up in convergence with the scheme of Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and any other scheme(s) of the State Government/Central Government.

Implementing Agency: Financial assistance will be provided by the Department of Sports.

2. **Community Coaching Development:** In this vertical, community coaches will be provided and coaching infrastructure developed across the country, based on a cascading model. A short-term Programme will be evolved for 'community coaching development'. From among the pool of existing Physical Education Teachers (PETs), about 2000 will be identified and will be trained as master trainers each year. They will in turn train other PETs/Volunteers as community coaches and develop teams at community level. Further, a system will be evolved for induction and utilization of community coaches.

Implementing Agency: Laxmibai National Institute of Physical Education (LNIPE) and institutes of Sports Authority of India (SAI), are assigned for developing content and other protocols as well as conduct trainings for Master Trainers.

3. **State Level Khelo India Centres:** To utilize all available resources of sports such as unemployed trained coaches, other support staff, equipment, playing fields etc. a Memorandum of Understanding (MoU) will be signed between Sports Authority of India (SAI) and States/UTs and support will be provided to States/UTs to run centres where, as per SAI, day boarding schemes and training will be provided. Further, online sports coaching and education will be provided through Khel Pathshalas.

Implementing Agency: SAI will be the implementing agency.

4. **Annual Sports Competitions:** Khelo India will be the basic platform to showcase sporting skills and accordingly become a platform for talent spotting and providing development pathways for gifted and talented children to achieve excellence. The Central Government will organize National level competitions, i.e., Khelo India National School Games and Khelo India National University Games.





Do you know?

In the First Khelo India Youth Games 2018, Haryana with 102 medals (38 golds, 26 silvers and 38 bronzes) was on top of the medal tally, followed by Maharashtra (111 medals including 36 golds) and Delhi (94 medals including 25 golds).

On February 27, 2019, PM Narendra Modi launched the Khelo India App at the Youth Indian Parliament in Vigyan Bhawan, New Delhi to promote sports and fitness.

Implementing Agency: Technically, conducting of the competitions will be done by the participating National Sports

Federations in collaboration with the SGFI or the AIU/University Sports Board or their sports body, as the case may be. Providing financial assistance and overall monitoring of all aspects relating to the conduct of competitions will be the responsibility of the Department of Sports.

Ministry of Youth Affairs & Sports (MYAS) will simultaneously make efforts to supplement the project 'State Level Khelo India Centres' from Corporate Social Responsibility (CSR) funding through Central Public Sector Enterprises (CPSEs) and Corporate Houses to ensure sustainable funding of recurring costs of these centres.



5. **Talent Identification and Development:** Under this scheme players from 16 priority sports are selected at various levels of participation. For selection of talented players, a High-Powered Committee is constituted by SAI. All selected players under this scheme are given the chance to join SAI, National Sports Academies or other top academies in the country along with annual financial assistance of Rs. 5 Lakhs for 8 years based on their performance.

Implementing Agency: Department of Sports through SAI and State Governments will provide financial assistance as well as overall guidance, supervision and monitoring.



6. **Utilisation and Creation/Upgradation of Sports Infrastructure:** Majority of the schools, colleges and even Universities in the country lack proper playgrounds as well as sporting infrastructure. Efforts will be made to utilize the existing available sports infrastructure all over the country especially those under the control of Central Government/State Governments.

This includes the following two agencies

- i. **University Centre of Excellence Programme:** Under this component, grants-in-aid will be provided for infrastructure, equipment, gym equipment, recovery equipment, coach deployment, training for coaches, team development, training camps for teams, opening of extension centres and University Sports Centres, league development, sports science back-up, etc. to identified Universities. Ministry of Human Resource Development shall ensure that Ministry of Youth Affairs & Sports is included in the University Grants Commission (UGC) Steering Committee for Sports in Universities.
- ii. **Creation of Appropriate Sports Infrastructure:** Under this component, grants-in-aid will be provided to States/UTs, SAI etc. to develop critical sports infrastructure and other infrastructure where there are gaps.

Implementing Agency: The Department of Sports will provide funding while execution of the projects will be through MYAS/SAI.

7. **Support to National/ Regional/State Sports Academies:** Throughout the nation, sports academies both public and private are identified for need-based support. Financial aid is also provided to the identified academies for their operation and maintenance.

Implementing agency: The project will be implemented through SAI/States/UTs/Private entities, including eminent sportspersons.

8. **Physical Fitness:** Under Khelo India the component of physical fitness of school going children is given due emphasis. National Level Physical Fitness parameters will be developed for each region. An assessment kit which is easy to administer will be provided to each school to evaluate physical fitness of all students. After assessing the level of fitness across school-going children, a component of enhancing fitness levels of children will also be undertaken. A grading system for schools will be developed to encourage competition among schools to promote fitness.





Implementing agency: The Programme will be implemented through the Lakshmibai National Institute of Physical Education (LNIPE) and Master Trainers trained under the Scheme in association with States/UTs/Schools. Other Institutions of Physical Education will be empaneled throughout the country for effective implementation of the Programme.

9. **Sports for Women:** All the components of the Khelo India Scheme are gender neutral and afford equal opportunities to women for participating in sporting activities and development of sports. In addition, this vertical is specially devoted to holding annual national competitions for women. Emphasis will be laid on such sports disciplines where there is less participation of women so that a greater number of women participate in such sports disciplines.

Implementing Agency: Competitions will be conducted by the participating National Sports Federations through the SAI/States/UTs.



10. **Sports for Peace and Development:** Under this vertical the Government of India provides a special package to J&K for enhancing sports facilities in the State. To ensure optimal utilization of the infrastructure, soft support in terms of coaches, equipment, consumables, technical support, competition etc. will be provided. Efforts will be made to organise village level competitions in

respect of sports disciplines popular in the State of J&K for positive engagement of youth. Similar efforts will also be made in case of other extremism and terrorism affected and disturbed areas.

Implementing agency: The module will be implemented in association with the State Governments through the SAI.



11. **Promotion of Sports Among Persons with Disabilities :** Financial assistance will be provided to States/UTs and SAI for creation of specialist sports infrastructure for persons with special needs. Funds provided under this head will also be used for classification of players, equipment, training and preparation of teams for Paralympic Games and disciplines and competitions.

Implementing agency: This component will be implemented through the SAI/ Paralympic Committee of India (PCI)/States/UTs and other agencies involved in development of Sports among persons with special needs, in association with the beneficiary organisations.

12. **Promotion of Rural and Indigenous/Tribal Games:** In order to showcase and encourage children and youth to take up rural and indigenous/tribal games, annual competitions are organized under the Khelo India Scheme. Thus, we can say that 'Khelo India Programme' is not just about winning medals at the world sporting arena. It is a mass movement initiated by the Indian government to provide every possible support and facility to youth of the country for participation in sports. Under this Programme governments thrive to focus on each and every aspect that will contribute to making sports more popular among the youth of the country. The end result of this initiative will be to make India one of the top sporting nations in the world.





Do you know?

Ministry of Youth Affairs and Sports recognized archery, athletics, badminton, basketball, boxing, football, gymnastics, hockey, judo, kabaddi, kho-kho, shooting, swimming, volleyball, weightlifting, and wrestling as 16 Priority Sports disciplines.

1.5.5 Fit India Movement

FIT India Movement was introduced on 29th August, 2019 by Hon'ble Prime Minister with a objective to launch fitness as integral part of our lives .The Mission of the movement was to bring positive behavioural changes and to adopt physical active healthy lifestyle. Towards achieving this mission, Fit India proposes to undertake various initiatives and conduct events to achieve the following objectives:

- To promote fitness as easy, fun and free
- To spread awareness on fitness and various physical activities that promote fitness through focused campaigns
- To encourage indigenous sports
- To make fitness reach every school, college/university, panchayat/village, etc.
- To create a platform for citizens of India to share information, drive awareness and encourage sharing of personal fitness stories.

I. Tick the correct option.

1. How many verticals are there in Khelo India Programme?
 - i. Ten
 - ii. Eleven
 - iii. Twelve
 - iv. Thirteen
2. The Ministry of Youth Affairs and Sports, Govt. of India launched the Khelo India Programme in
 - i. 2013-2014
 - ii. 2014-2015
 - iii. 2016-2017
 - iv. 2017-2018





3. The maximum duration of 'Long Term Athlete Development Programme' is
 - i. 4 Years
 - ii. 6 Years
 - iii. 8 Years
 - iv. 12 Years
4. The scheme of 'Sports for Peace & Development' is exclusively for the state/UT
 - i. Jammu & Kashmir
 - ii. Delhi and NCR
 - iii. Uttar Pradesh
 - iv. Punjab

II. Answer the following questions briefly.

1. What is Khelo India Programme?
2. What is the philosophy of Khelo India Programme?
3. What is the vision and mission of Khelo India Programme?
4. What is the plan of government under the vertical of 'Promotion of Sports Among Persons with Disabilities'?

III. Answer the following questions in 150-200 words.

1. What is the need of sports competition in school? Discuss in detail.
2. Will the increase in professional sports leagues bring any transformation in Indian sporting culture? Justify your answer.
3. Do you think 'Sports for Peace and Development' will work for restoration of peace in Jammu and Kashmir? Support your answer with evidence.

IV. Complete the table about Khelo India given below.

Launched in	
Launched by	
Vision of Programme	
Mission of Programme	
Aims and on of Programme	





V. Case Study



Rohan, a student of class XI has taken up physical education as he is very interested in making his career in the field of Physical Education. When he was introduced to the career options available in the subject he became a bit hesitant about continuing in this field because for him physical education was just about playing so he approached his subject teacher to explain his position. On the basis of the given information given below are a few queries of Rohan and you have to give him the reply according to the information provided to you in your first chapter.











- (A.) A child interested in reporting the sports event should further study _____.
- (B.) For making a future in Officiating a person should do _____ course.
- (C.) Teaching physical education to primary students requires _____ as qualification.
- (D.) Designing and researching sports equipment is related to _____.
- (E.) Sports journalism involves _____.

VI. Art Integration

Art Integration













The Ministry of Youth Affairs and Sports, Govt. of India has organized a competition for a song for the opening ceremony of Khelo India School Games.

Working in groups, write a song for the competition and set it to music.

Weblinks		
Topic	Weblinks	QR Code
Indian Today News "CBSE makes Sports period compulsory everyday for Class 1-8 from April 2019"	https://www.indiatoday.in/education-today/news/story/cbse-sports-period-class-1-8-physical-education-divd-1480665-2019-03-18	
Josh Jagran News "Compulsory Sports Period for CBSE Students from April 2019"	https://www.jagranjosh.com/articles/cbse-students-to-have-a-compulsory-sports-period-from-april-2019-1552894646-1	
NDTV News "Compulsory Sports Period Every Day for CBSE Students"	https://www.ndtv.com/education/cbse-students-to-have-compulsory-sports-period-from-class-1-2008915	
Defining our Field	http://samples.jbpub.com/9781284034080/Chapter1.pdf	
Evaluation of Physical Education	https://www.inspiresport.com/the-evolution-of-p-e-in-schools/	
The Importance of Physical Education	http://www.veanea.org/home/1000.htm	
14 Essential Aim and Objectives of Physical Education	http://www.preservearticles.com/education/aims-and-objectives-of-physical-education/5158	
Aim and Objectives of Physical Education	https://www.importantindia.com/27346/aims-and-objectives-of-physical-education-pe-10-aims-and-10-objectives/	
National Council for Teacher Education (NCTE)	http://ncte-india.org/ncte_new/	
NCTE PE Courses	http://ncte-india.org/ncte_new/?page_id=910	





D.P.Ed.	http://www.ncte-india.org/ncte_new/regulation2014/english/appendix6.pdf	
B.P.Ed.	http://www.ncte-india.org/ncte_new/regulation2014/english/appendix7.pdf	
M.P.Ed.	http://www.ncte-india.org/ncte_new/regulation2014/english/appendix8.pdf	
Career in Physical Education	https://www.examsplanner.in/career-in-physical-education/	
Physical Education Courses in India with Career Option	https://targetstudy.com/courses/physical-education-courses.htm	
Sports Competition in India	https://en.wikipedia.org/wiki/Category:Sports_competitions_in_India	
National Games	https://en.wikipedia.org/wiki/National_Games_of_India	
CBSE Inter-School Sports	http://cbsegames.in/	
National School Games	https://www.sgfbharat.com/index.php?option=com_content&view=article&id=467&Itemid=120	
Inter University Competitions	http://www.aiu.ac.in/Events/events.asp	
Khelo India Youth Games	https://en.wikipedia.org/wiki/Khelo_IndiaYouthGames	
Khelo India University Games	http://www.aiu.ac.in/sports/Khelo%20India%20University%20Games%202018-19.pdf	

Duleep Trophy	https://en.wikipedia.org/wiki/Duleep_Trophy	
Ranji Trophy	https://en.wikipedia.org/wiki/Ranji_Trophy	
Z.R. Irani Cup	https://en.wikipedia.org/wiki/Irani_Cup	
Indian Premier League	https://www.iplt20.com/	
Santosh Trophy	https://en.wikipedia.org/wiki/Santosh_Trophy	
I-League	https://i-league.org/	
Indian Super League	https://www.indiansuperleague.com/	
Indian Women's League	https://en.wikipedia.org/wiki/Indian_Women's_League	
Hockey India League	http://league.hockeyindia.org/	
Pro Kabaddi League	https://www.prokabaddi.com/	
Premier Badminton League	http://www.pbl-india.com/	





Pro Volleyball League	https://provolleyball.in/	
Pro Wrestling League	http://www.prowrestlingleague.com/	
Summer Olympics	https://en.wikipedia.org/wiki/Summer_Olympic_Games	
Winter Olympics	https://en.wikipedia.org/wiki/Winter_Olympic_Games	
Commonwealth Games	https://en.wikipedia.org/wiki/Commonwealth_Games	
Asian Games	https://en.wikipedia.org/wiki/Asian_Games	
Khelo India Programme	https://yas.nic.in/sports/khelo-india-national-Programme-development-sports-0	



UNIT 2

OLYMPIC VALUE EDUCATION



Content

Olympism - Concept and Olympics Values (Excellence, Friendship & Respect)

Olympic Value Education - Joy of Effort, Fair Play, Respect for Others, Pursuit of Excellence, Balance Among Body, Will & Mind

Ancient and Modern Olympics

Olympics - Symbols, Motto, Flag, Oath, and Anthem

Olympic Movement Structure - IOC, NOC, IFS, Other members





Learning Outcomes

At the end of this unit, you will be able to:

- ◆ incorporate values of Olympism in your life.
- ◆ differentiate between Modern and Ancient Olympic Games, Paralympics and Special Olympic games
- ◆ identify the Olympic Symbol and Ideals
- ◆ describe the structure of Olympic movement structure

Discussion

The Olympic Symbols are icons, flags, and symbols used by the International Olympic Committee (IOC) for the Olympic Games.

1. The Olympic flag was created under the guidance of Baron Coubertin in 1913 and was released in 1914. But it was first hoisted in 1920 in Antwerp, Belgium at the 1920 Summer Olympics in the main stadium. How many rings does the Olympics flag have? What do these rings represent? What are the colours of the rings? What do these colours represent? What values do the rings represent?
2. The Olympic motto is Citius, Altius, Fortius. What does it mean?
3. What values do the Modern Olympic Games embody? Look at the word cloud given below. List as many values as you think are embodied by the Olympic Games.

Create your own Olympics word cloud.



2.1.1 THE OLYMPISM

“Olympism is a philosophy of life, exalting and combining in a balanced whole the qualities of body, will and mind. Blending sport with culture and education, Olympism seeks to create a way of life based on the joy found in effort, the educational value of good example and respect for universal fundamental ethical principles.”

The Olympic Movement or Olympism is a philosophy of Olympic Games which is developed and endorsed by the International Olympic Committee. It promotes friendship, respect, fair play and sportsmanship through sports activities and stands against discrimination on the basis of gender, race, religion or nationality. It also expands the area of Olympism from sports activities to promoting peace and brotherhood. "The goal of the Olympic Movement is to contribute to building a peaceful and better world by educating youth through sport without discrimination of any kind and in the Olympic spirit, which requires mutual understanding with a spirit of friendship, solidarity and fair play."



Fundamental Principles of Olympism

In the Olympic Charter following Fundamental Principal of Olympism are described.

1. Olympism is a philosophy of life, exalting and combining in a balanced whole the qualities of body, will and mind. Blending sport with culture and education, Olympism seeks to create a way of life based on the joy of effort, the educational value of good example, social responsibility and respect for universal fundamental ethical principles.
2. The goal of Olympism is to place sport at the service of the harmonious development of human kind, with a view to promoting a peaceful society concerned with the preservation of human dignity.
3. The Olympic Movement is the concerted, organised, universal and permanent action, carried out under the supreme authority of the IOC, of all individuals and entities who are inspired by the values of Olympism. It covers the five continents. It reaches its peak with the bringing together of the world's athletes at the great sports festival, the Olympic Games. Its symbol is five interlaced rings.
4. The practice of sport is a human right. Every individual must have the possibility of practicing sport, without discrimination of any kind and in the Olympic spirit, which requires mutual understanding with a spirit of friendship, solidarity and fair play.
5. Recognising that sport occurs within the framework of society, sports organisations within the Olympic Movement shall apply political neutrality. They have the rights and obligations of autonomy, which include freely establishing and controlling the rules of sport, determining the structure and governance of their organisations, enjoying the right of elections free from any outside influence and the responsibility for ensuring that principles of good governance be applied.
6. The enjoyment of the rights and freedoms set forth in this Olympic Charter shall be secured without discrimination of any kind, such as race, colour, sex, sexual orientation, language, religion, political or other opinion, national or social origin, property, birth or other status.
7. Belonging to the Olympic Movement requires compliance with the Olympic Charter and recognition by the IOC.





2.1.2 OLYMPIC VALUES

The Olympic Games have established themselves as a global celebration of sport and peace. Through a combination of sport, culture and education, the Olympic Movement uses sport as a tool to promote fundamental ethical principles and support harmonious development for all. The Paralympic movement promotes universal values: courage, determination, inspiration, equality. The three important core values of Olympism central to Olympic Games are Excellence, Respect and Friendship. These core values are considered important in life to make it worth living and helps in decision-making on moral terms.

Olympic Values Friendship

Friendship is at the core of the Olympic Movement. It encourages us to see sport as an instrument for mutual understanding between individuals, and between peoples all over the world. Friendship brings Olympic and Paralympic athletes and people from around the world together in sport, play and competition. It breaks down barriers - encouraging individuals to look beyond the differences such as gender, ability, culture, race or religion. By welcoming everyone's differences we are able to establish stronger bonds. Friendships can be the basis of connections within community for working together and supporting each other.

Respect

Respect lies at the heart of Olympism - respect for yourself and your body, for other people, for rules and regulations, for sports and for the environment. In fact, respect is the key to strong friendships, fair play and sportsmanship. Understanding the impact of our actions, positive or negative, is an important part of playing a participative role in our communities. Respecting yourself and others goes beyond sport.

Respect includes

- knowing that we can offend or hurt someone by not letting them join in our game (respect of others).
- listening to and asking for the ideas, opinions and beliefs of everyone-boys, girls, people living with a disability (respect for others).
- helping others to feel safe from violence-teasing, bullying, and verbal, physical and sexual violence (respect for others).
- taking care of ourselves by choosing to eat healthy food, while getting enough rest and exercise (self-respect).
- being confident in ourselves to share and defend our ideas and opinions (self- respect).





Excellence

Excellence means doing the best we can, on the field of play or in our professional life. The important thing is not winning, but taking part, making progress and enjoying the healthy combination of body, will and mind. It is about having an ambition in life, and through determination, effort and perseverance reaching that goal. Excellence is not only on the sporting field; it is also in the classroom, where all children have the right to an education (Article 28), and also by helping children pursue excellence by chasing their dreams.

I. Tick the correct option.

1. IOC stands against discrimination on the basis of:
 - a. Gender
 - b. Race
 - c. Religion
 - d. Education
2. Which is NOT an Olympic core value?
 - a. Excellence
 - b. Commitment
 - c. Respect
 - d. Friendship
3. "Helping others to feel safe from violence" is an example of which of the following Olympic value?
 - a. Friendship
 - b. Respect
 - c. Excellence
 - d. Trust
4. In which of the following Olympics values "Mutual understanding between two persons" took place?
 - a. Friendship
 - b. Respect
 - c. Excellence
 - d. Trust





II. Answer the following questions briefly.

1. What do you understand by Olympism
2. Describe any one of Olympic core Value.

III. Answer the following questions in 150-200 words.

1. Write a note on the principle of Olympism.
2. Discuss the components of Olympic Movement.

2.2.1 OLYMPIC VALUE EDUCATION

The Olympic Values Education is based on the Olympic philosophy that learning takes place through the balanced development of body and mind. The core values also include five educational values which have been incorporated from three domains of learning: Mental, Emotional, and Physical.

- Joy of effort
- Fairplay
- Respect for others
- Pursuit of excellence, and
- Balance in life between body, will and mind.

Joy of Effort

According to the UNESCO Charter “every human being has a fundamental right to access to physical education and sport, which are essential for the full development of his/her personality. The freedom to develop physical, intellectual and moral powers through physical education and sport must be guaranteed both within the educational system and in other aspects of social life...”. Thus, the child needs to enjoy and have fun with sports and physical activities he/she is engaged in.

Otherwise, an individual, if forced to over-exert while playing without being given good experiences to remember or cherish, may develop bad memories. Sports or physical activities should be promoted with appropriate opportunity to enjoy the energy and effort with relative outcomes.





Do you know?

An example of joy of effort with running was published in a newsletter of the IOC, where in Kipchoge Keino, a 5-year - old boy from a small village Kenya, who lived four miles from his school with no public transport available, walked or ran to school and back. He enjoyed the running, and, in two to three years he would come home for lunch and go back to school for his remaining classes. At the same time, he developed an incredible aerobic system and soon he competed in national events and went on to become an international player. He got a job with the Kenyan police as a fitness train errand became an example to other cadets.

Fair Play

Although fair play is a concept of sports, it can be applied in many different ways and contexts beyond the sports field. Fair play refers to playing by the rules. Learning fair play behaviour in sport can lead to the development and reinforcement of similar behaviour in one's everyday life. After participating in sports an individual develops the habit of fair play that is reflected in his/her attitude and behaviour in life and towards the community he/she lives in. In sports, an individual follows the rules. Referees and officials enforce rules through penalties and punishments. There are many ways through which the concept of fair play can be reflected like shaking hands with the opponent at the end of the game, appreciating the opponent's extraordinary performance etc.

Do you know?

Eugenio Monti made Olympic fair play history in the town of Innsbruck, Austria, during the Winter Games of 1964. One of the world's best bobsleighters, Monti had already won a bronze medal in the four-man bobsleigh. He really wanted to win an Olympic gold medal in the two-man bobsleigh. As he waited with his partner at the top of the run for his turn, he realised his main rivals, Robin Dixon and Tony Nash of Great Britain, had lost a bolt that held the runner to their sled. Without that bolt, they could not participate in the race. Without giving it any second thought, Monti lent the pair the bolt from his own sled. Nash and Dixon raced down the track to capture the gold medal. Monti had to settle for third place, but he was awarded a special Fair Play Trophy by CIPF for his act of generosity. Four years later, Monti won gold medals in both the two-man and the four-man bobsleigh events.





Respect for others

As per the Olympic Charter "The goal contribute to building a peaceful and better world by educating youth through sport practised in accordance with Olympism and its values." Living in a multicultural world, we need to accept and respect diversity and promote peace. We should appreciate the worth of all peoples and all cultures, irrespective of race, age, gender and ability. Violence is not the best way to solve conflicts. This acceptance can be achieved through sport, because a sports team may consist of people from different cultures, all focussed on one goal, that is, victory for the team. The task of bringing peace to societies becomes even more challenging for sports leaders and educators in societies where there are ancient hatreds, conflicting values or great economic differences among people. For example, since the end of Apartheid, South Africans have worked together to create a new society, one in which there is acceptance and respect for people of all races. Sport persons and educators have an important role in this process as acceptance and respect for cultural difference has to be taught. Racism and intolerance are often a result of ignorance and fear. Understanding and acceptance of difference develops when people live, work and play together.

Do you know?

At Nazi-hosted 1936 Berlin Olympic Games, it was virtually demanded that white, Aryan supremacy and athletic prowess was to dominate. Jesse Owens, a black man from USA won four gold medals, and he was aided to one of those victories by a blond, muscular German athlete, Luz Long. Long, the European long-jump record holder, advised Owens, his competitor at the Games, when he was having difficulty qualifying for the final of the long jump. Owens had failed twice in his bid to qualify for the long jump final, and was on his final attempt when Long suggested Owens adjust his starting point to avoid overstepping the take-off board. Owens followed Long's advice, and he qualified. In the finals, with Hitler, Goebbels and Himmler looking on, Owens set about his final attempt. In the frenzied atmosphere, Long looked to the crowd, raised his arms and then lowered them to quell the noise, before casting a "furtive" glance at the Fuhrer. The stadium quietened, Owens was able to concentrate, and he leapt to victory, leaving Long with the silver medal.

Pursuit of Excellence

In today's competitive and demanding world, an individual's focus is to become the best. Focusing on excellence can help young people to make positive, healthy choices and strive to become the best that they can be in whatever they do. Sports provide an opportunity to players to become the best or to make healthy choices in safe social and physical surroundings. A healthy, clean and safe community makes the welfare of young people its number one priority. Sport sharpens skills





and attends to the needs of all children and youth—girls and boys, children with learning disabilities, and children with hearing, vision and other physical disabilities. It provides an environment free from discrimination, harassment and fear. Sport also provides daily opportunities for children and youth of all ages to participate in physical activity in an environment free from discrimination, harassment and intimidation. It is also a place in which individual differences and cultural traditions are valued and respected.

Balance Between Body, Will and Mind

Do you know?

Deng Yaping of China, a hugely talented table tennis player, started when she was five. By the time she was nine she had won her provincial junior championship. At the age of 13, she had won her first national championship. But being less than 1.5 metre tall, she was initially rejected for the national team, despite her talent. However, it was her talent, her confidence and her perseverance that finally saw her selected in 1988. She won her first international doubles title in 1989 when she was only 16, and her first singles title two years later. “Even from an early age, I dreamed of being world champion,” she said. In 1989, she won the Asian Cup and in 1991 she captured the world singles title.

Pierre de Coubertin understood that an international revival of the Olympic Games would stimulate interest in sports and physical activity among young people. This remains as relevant today, as it was over 100 years ago. The focus of the modern Olympic Movement extends beyond sports, embracing cultures, artistic works, environmental awareness and education. All of these can play their part in helping young people to build a balanced approach to life. Pierre de Coubertin maintained, “Modern education... has allowed itself to be carried away by extreme compartmentalisation. Each strength works in isolation, without any link or contact with its neighbour. If the topic is muscles, they only want to see animal function. The brain is furnished as though it were made up of tiny, air-tight compartments.” He believed in the concept that learning happened in the whole body, not just in the mind. Physical learning, too, took place in both body and mind but it could not be done without will. Sport is a medium of balancing body, will and mind.





Do you know?

At Montreal 1976, a young Japanese gymnast performed his routine on the rings. He twisted, turned and balanced, before performing his landing—a double somersault with a full twist— landing perfectly with both feet. He stood for the required three seconds, but then collapsed in agony because he had been performing with a broken knee, injured during the floor exercises. “I didn’t want to worry my team-mates,” explained Fujimoto. He couldn’t take painkillers because of doping regulations. “I made myself for get what might happen when I landed,” he said later. So, he endured his pain and kept it to himself. Though Fujimoto wanted to carry on inspite of his injuries, his coach and his team- mates, now aware of his pain, would not allow him to continue with such a severe injury. However, inspired by Fujimoto’s pride and courage, they all did their very best and won the gold medal defeating the team from USSR.

Extension Activity

You read about some athletes who embody Olympic values.

Working in groups find out about other such athletes and make a presentation in class.

I. Tick the correct option.

1. “Playing beyond the rules of the game” is violation of which of the following educational value?
 - a. Pursuit of Excellence
 - b. Balance Between Body, Will and Mind
 - c. Joy of Effort
 - d. Fair Play

II. Answer the following questions briefly.

1. Explain “Balance Between Body, Will and Mind” as Olympic Educational Value.
2. Illustrate the concept of fair play with sports examples

III. Answer the following questions in 150-200words.

1. Describe Olympic Educational Values with suitable examples.





2.3.1 ANCIENT OLYMPIC GAMES

The ancient Olympic Games were organized in honour of Zeus, the ruler of Greek gods and goddesses, as a part of a religious festival. Olympic Games or Olympics get their name from Mount Olympus, the highest mountain in Greece or Olympia, a town in Elis in ancient Greece. The festival and games began in 776 BCE at Olympia.



At first, the only event at Olympia was the foot race. Later, sprints wearing full armour, and longer races, were added. Chariot racing and combat sports such as boxing and wrestling were soon regular features too. The open-air track for horse racing was called hippodrome. The participants were free male citizens of different city states within Greece. All participants had to receive 10-month training prior to the Olympic Games. Women were not allowed to participate in the games. In fact, they were not even allowed to attend or witness the games. There was, however, a loophole to this rule - chariot owners, not riders, were declared Olympic champions and anyone could own a chariot. Kyniska, daughter of a Spartan king, took advantage of this, claiming victory wreaths in 396BCE and 392BCE.

The games were conducted every four years and the period between two games was known as Olympiad. The month when the Olympic Games were held was considered a sacred month and all disputes and wars would be stopped and peace would be declared to facilitate the movement of spectators and athletes.

Do you know?

It is said that when the Persians invaded Greece in the summer of 480BCE, a lot of the Greek city states agreed that they would put together an allied army but they had a very hard time getting one together because so many people wanted to go to the Olympics. So, they actually had to delay putting the army together to defend the country against the Persians.

Initially, the truce lasted for one month but in later centuries it was extended to three. No wars were permitted, no arms could be carried in the territory of Elis and no hindrance was to be given to any spectator, athlete or theoriai- (the official missions representing particular cities) travelling to the games wherever they came from and whichever territory they had to cross.

For the first 12 Olympics the stadion foot race was the only event and it remained the most prestigious event throughout the history of the Games. The race was run

over one length (a stadion) of the stadium track, 600 ancient feet or 192 m and preliminary heats were held with the winners of the heats going into the finals.

Do you know?

The ancient Olympic Games were initially a one-day event until 684BCE, when they were extended to three days. In the 5th century BCE, the Games were extended again to cover five days. The ancient Games included running, long jump, shot put, javelin, boxing, pankration and equestrian events.

Over time other events were added to the Games to bring the total Programme to 18 events spread over five days. Sports which were included in the ancient Olympic Games included foot race, chariot race, horse race, Pentathlon (running, long jump, discus throw, javelin throw, and wrestling), boxing, wrestling, Pancratiun etc. Athletes were grouped by lot, and in the interest of fairness, this was also the way pairings were matched in the other events. The eventual winner of the stadion would even give his name to that particular Games and so be remembered for all time. Koroibos a Greek cook, baker and athlete from Elis, won the stadion race in the first recorded Ancient Olympic Games in 776BCE.

Do you know?

The Olympic Games included

- **diaulos-** the two stadium lengths foot race, added in 724 BCE.
- **dolichos-** longer foot races 7 to 20 stadium lengths, added in 720 BCE.
- **wrestling-** added in 708 BCE. Competitors had to throw the opponent to the ground three times to gain victory.
- **pentathlon-** also added in 708 BCE. All done in a single day, the event order was: jumping (in a soft soil pit using hand-weights or halteres and accompanied music), discus (in stone, iron or bronze), stadion, javelin (in wood and thrown using a leather thong), and wrestling. Just how an athlete won the over all event is unclear, three event victories may have guaranteed overall victory.
- **boxing-** added in 688 BCE. Athletes wore straps of leather (himantes) around their hands, initially as protection but they evolved in to destructive weapons with metal pieces added. Rules were limited to no low-blows and no holding. Serious injuries were common and deaths not unknown.
- **Tethrippon -** the four - horse chariot race added in 680 BCE was run over ten or twelve circuits of the hippodrome. A version using of also over 8 circuits was added in 384 BCE.





- **keles-** a horse race added in 648 BCE and run over 6 circuits. A version for foals was added in 256 BCE.
- **pankration-** a mix of boxing and wrestling also added in 648 BCE. The pankration was a brutal event and the only moves not allowed were biting and gouging, although competitors did not wear the damaging leather thongs of the boxers.
- **Hoplitodromos-** the race in hoplite armor (helmet, shield and spear) between 2 and 4 stadium lengths was added in 520 BCE and was usually the last event of the Games.
- **apene-** a race with chariots pulled by two mules, added in 500 BCE (dropped from 444 BCE).
- **kalpe-** a trotting horse race for mares, added in 496 BCE (dropped from 444 BCE).
- **synoris-** the two-horse chariot race run over eight circuits of the hippodrome, added in 408 BCE. A version using of three circuits was added in 268 BCE.

The opening ceremony of Ancient Olympic Games started with assembly of the competitors, their coaches, their fathers, their brothers and the judges in the council house in front of the statue of Zeus to take the oath. The competitors took an oath that they would not use unfair means and would participate in the games as per rules and regulations. The Judges pledged that they would be fair and honest in the judgments during the games. During the march past, the announcer/ commentator announced the name, father's name and city of the competitor in public and asked whether anyone from the spectators had any kind of objection as regards to their eligibility.

In the times of the ancient Olympic Games, there was only one winner. The Olympionik (the winner of the Olympic Games) was immediately rewarded after the competition. A herald announced the name of the winner, then he was awarded olive leaves plucked from the temple of Zeus and that was the

highest honour. They tied a ribbon of red wool, a taenia, around his head and hands in the sign of victory. The official prize ceremony took place on the last day of the Games in the raised hall in the Temple of Zeus. In a loud voice, the herald announced the name of the Olympic victor, his father and his city. Then a Hellenodikos placed a crown made of an olive branch, the kotinos, on the winner's head. Returning to his hometown, the athlete was welcomed as a hero and was given numerous advantages for the rest of his life. To show that he had become famous, the athlete had the right to have his own statue erected, among other things.

The Olympiad was named after the name of the winner of 200 yards race. The winner's names and figure were engraved on stone by sculptors and poems were written in their name to honour them.

The Roman Emperor Theodosius I legally abolished the games in 393 or 394 A.D. It was found that the games had lost their original values due to corruption, professionalism and foul play.



The "Discobolus" is a copy of a Greek statue from the 5th century BC. It represents an ancient Olympic discus thrower.

2.3.2 MODERN OLYMPIC GAMES

1503 years after Emperor Theodosius I ordered the closure of the Ancient Olympic games, once again Olympic games took place in 1896 in Athens, Greece. The idea behind restarting Olympic games came from French nobleman Baron Pierre de Coubertin. Coubertin was greatly interested in education, and he firmly believed that the best way to develop the minds of young people was to develop their bodies as well; he realised learning and athletics should go together. After he visited the ruins of ancient Olympia, it occurred to Coubertin that perhaps the best way to develop an interest in sports and games was to restart the Olympic Games. He hoped the new Games would bring back the ideals of physical, mental, and spiritual excellence displayed in the ancient Games, as well as build courage, endurance, and a sense of fair play in all who participated. In addition, he hoped the Games would turn the tide he saw world wide of the growing commercialism of sports. He also wanted an event that brought all nations together on one platform without barriers of race, creed, language and colour. In 1892, Coubertin first introduced the idea of starting the Olympic Games again. Few people were ready to accept his idea. But in 1894 Coubertin founded the International Olympic Committee (IOC) and began planning the first modern Olympiad.



Baron Pierre de Coubertin





Do you know?

Due to its historical significance, the Greek hosts wanted to win the marathon above all else. Spyridon Louis set off from the city of Marathon and took the lead four kilometers from the finish line and, to the joy of the 100,000 spectators, won the race by more than seven minutes.

As a result of Coubertin's efforts, the first modern Olympic Games were held in 1896 in Athens, Greece. The Games attracted athletes from 14 nations, with the largest delegations coming from Greece, Germany, France and Great Britain. Coubertin remained president of the International Olympic Committee until 1925. In this office he directed the course the Games were to take. He wrote the Olympic Charter, protocol, and athletes' oath, and he also planned the ceremonies.

Extension Activity

The Olympic Games have an interesting, and sometimes controversial history - from cancelled Games during World Wars to boycotts during international conflicts.

Select one of the following Olympic Games and working in groups, research to find out more about it.

- 1920
- 1936
- 1948
- 1972
- 1976
- 1980

Present your ideas to the class in the form of a Power Point Presentation.

The Olympic games are a competition between sportspersons and not between countries. The selection of athletes is done by the National Olympic Committees of the respective nations.





Art Integration - RECREATING THE ANCIENT OLYMPICS

Each group must represent a Team from an ancient Greek city of their choice. They have to

- choose a different Greek god who will be the mascot of their team, research the god and make a clay statue of the god.
- Create their own banner for the opening parade.
- light the Olympic flame.
- sign the Olympic truce.
- take the Olympic oath at the start of the games.
- research and cook a Greek dish

On the day of the "Olympic Games" the Groups will come dressed in traditional Greek dress,

Although the modern Olympic Games are patterned after the ancient Greek Games, there are important differences. Unlike ancient Greece, modern nations have not stopped wars for peaceful athletic competitions. Because of World War I, Games were not held in 1916. Nor were they held in 1940 and 1944, during World War II. While at the ancient Games, athletes competed in individual sporting events, modern games also have lots of team events. Unlike the ancient Olympics, the modern games are not a religious festival. The earlier Games were open only to Greek males who participated in the games without wearing any clothes. The modern Games encourage athletes from all nations who have a National Olympic Committee (NOC) that is recognized by the International Olympic Committee (IOC) to compete. In modern Olympics man and women are equally encouraged and honoured. All participants at the modern Olympics must wear proper sports kit during the competition.

In the first Olympic Games held in Athens in 1896, 241 athletes from 14 countries participated in 43 events in the Panathenaic Stadium. In 1900, in the Paris Olympics, about 997 athletes from 24 countries competed. The 1900 Olympic Games are of great significance as this was the first one when 22 women competing in select sports. As the games became popular, lots of countries joined up. In 2016, 11,238 athletes from 207 Nations participated in 28 sports at the Summer Rio Olympics.

Do you know?

In 1904 the Olympic was hosted in St. Louis, but the number of nations and athletes competing fell to 12 countries and about 651 athletes. This decrease in participant numbers was due to the lengthy transatlantic boat ride needed to be made by the European competitors to attend the Games. However, ever since the 1908 London games, which attracted about 2,000 athletes, more than the first three Olympics combined, there has generally been a rise in participation.





Due to two World Wars, three times games were cancelled in 1916, 1940, 1944. The First Winter Olympics was held in 1924 in Chamonix, France, in connection with the Paris Games held three months later to feature snow and ice sports that were impossible to hold during the Summer Games. Although figure skating (in 1908 and 1920) and ice hockey (in 1920) were featured as Olympic events at the Summer Olympics, the IOC desired to expand this list of sports to encompass other winter activities. At the 1921 Olympic Congress in Lausanne, it was decided to hold a winter version of the Olympic Games. The 1924 Olympics in Chamonix were the first Winter Olympic Games. Although at first it was intended that the same country host both the Winter and Summer Games in a given year, this idea was quickly abandoned. The IOC mandated that the Winter Games be celebrated every four years on the same year as their summer counterpart. This tradition was upheld until the 1992 Games in Albertville, France; after that, beginning with the 1994 Games, the Winter Olympics were held every four years, two years after each Summer Olympics.

Do you know?

Host Cities			
Summer Olympics		Winter Olympics	
Year	City	Year	City
1896	Athens, Greece	1924	Chamonix, France
1900	Paris, France	1928	Saint Moritz, Switzerland
1904	Saint Louis, USA	1932	Garmisch Partenkirchen, Germany
1908	London, Great Britain	1936	Garmisch Partenkirchen, Germany
1912	Stockholm, Sweden	1948	Saint Moritz, Switzerland
1916*	not held because of war	1952	Oslo, Norway
1920	Antwerp, Belgium	1956	Cortina d'Ampezzo, Italy
1924	Paris, France	1960	Squaw Valley, USA
1928	Amsterdam, Netherlands	1964	Innsbruck, Austria
1932	Los Angeles, USA	1968	Grenoble, France
1936	Berlin, Germany	1972	Sapporo, Japan
1940*	not held because of war	1976	Innsbruck, Austria
1944*	not held because of war	1980	Lake Placid, USA
1948	London, Great Britain	1984	Sarajevo, Yugoslavia
1952	Helsinki, Finland	1988	Calgary, Canada
1956	Melbourne, Australia & Stockholm, Sweden (equestrian events)	1992	Albertville, France
1960	Rome, Italy	1994	Lillehammer, Norway
1964	Tokyo, Japan	1998	Nagano, Japan



1968	Mexico City, Mexico	2002	Salt Lake City, USA
1972	Munich, Germany	2006	Turin, Italy
1976	Montreal, Canada	2010	Vancouver, Canada
1980	Moscow, USSR	2014	Sochi, Russia
1984	Los Angeles, USA	2018	Pyeong Chang, KoreaSouth
1988	Seoul, Korea		
1992	Barcelona, Spain		
1996	Atlanta, USA		
2000	Sydney, Australia		
2004	Athens, Greece		
2008	Beijing, China		
2012	London, Great Britain		
2016	Rio de Janeiro, Brazil		
2020	Tokyo, Japan		

I. Tick the correct option.

1. The Ancient Olympic Games started in
 - i. 776 BCE
 - ii. 394 AD
 - iii. 1896
 - iv. 1986
2. The idea for reviving the Olympic Games came from
 - i. Eunice Kennedy Shriver.
 - ii. Baron Pierre de Coubertin
 - iii. Dion Nash
 - iv. Ludwig Guttmann
3. The first Modern Olympic games started in .
 - i. 1894
 - ii. 1996
 - iii. 1896
 - iv. 1898





II. Answer the following questions briefly.

1. Write down the eligibility conditions of a competitor in ancient Olympics.
2. Explain preliminary development to start modern Olympic games.

III. Answer the following questions in 150-200 words.

1. Write a brief note on the origin and conduct of Ancient Olympics.
2. How did the Modern Olympic games originate?

2.4.1 THE OLYMPIC CREED

The creed, or guiding principle, of the modern Olympic Games is a quote by Baron de Coubertin: "The most important thing in the Olympic Games is not to win but to take part, just as the most important thing in life is not the triumph but the struggle. The essential thing is not to have conquered but to have fought well."

2.4.2 THE OLYMPIC SYMBOL

The Olympic symbol is five interlocked rings of equal proportions of five different colours. The colour sequence of the rings from left to right is, blue, yellow, black, green and red, where blue, black and red rings are placed at the top, the yellow and green rings are placed at the bottom. The five rings reflect the union of the five continents namely North and South America, Africa, Asia, Australia, and Europe and this is a symbol of the unity of sportspersons from all continents at Olympic Games.



2.4.3 THE OLYMPIC FLAG

The Olympic flag was created by Baron Coubertin in 1913 and was released in 1914. It has a white background without any border. The Olympic symbol of the five interlocked rings is placed in the centre. In the words of Pierre de Coubertin, "The Olympic flag has a white background, with five interlaced rings in the centre: blue, yellow, black, green and red. This design is symbolic; it represents the five continents of the world, united by Olympism, while the six colours are those that appear on all the national flags of the world at the present time (1931).". The flag was hoisted for the first time in 1920 in Antwerp, Belgium.





2.4.4 THE OLYMPIC MOTTO

The motto of the Olympic Games is “Citius - Altius - Fortius” which is Latin for “Faster- Higher- Stronger”. It expresses the aspirations of the Olympic Movement. It was proposed by Pierre de Coubertin upon the creation of the International Olympic Committee in 1894. Coubertin borrowed it from his friend Henri Didon, a Dominican priest, who was an athletics enthusiast. The Olympic motto was first announced in 1924 held at the Olympic Games in Paris, France.



2.4.5 THE OLYMPIC EMBLEMS

Each Olympic Games has its own Olympic emblem, which is a design integrating the Olympic rings with one or more distinctive elements. They are created and proposed by the Organising Committee of the Olympic Games (OCOG) or the National Olympic Committee (NOC) of the host country. It is the responsibility of the International Olympic Committee (IOC) to approve Olympic emblems for the Olympic Games. Olympic emblems are used in promotional materials, by sponsors of the Olympics, on the uniforms of every Olympic competitor. All emblems are the property of the IOC.



2.4.6 THE OLYMPIC ANTHEM

The Olympic Hymn, also known as the Olympic anthem, is a musical work composed by Spiro Samara, and is played when the Olympic flag is raised in the opening of Olympic Games.

The Olympic anthem

“Immortal spirit of antiquity,





Father of the true, beautiful and good, Descend, appear, shed over us thy light
Upon this ground and under this sky

Which has first witnessed thy unperishable fame

Give life and animation to those noble games! Throw wreaths of fadeless flowers
to the victors In the race and in the strife!

Create in our breasts, hearts of steel!

In thy light, plains, mountains and seas Shine in a roseate hue and form a vast temple
To which all nations throng to adore thee, Oh immortal spirit of antiquity!"

2.4.7 THE OLYMPIC FLAME, OLYMPIC TORCHES

The Olympic flame was first lit in 1928 at Amsterdam, Netherlands Olympic Games. It is a continuity symbol of ancient and modern Olympic Games. The Olympic flame is lit in front of the ruins of the Temple of Hera in Olympia by focussing the rays of the sun using a parabolic mirror to ignite a flame. A long relay of runners carries the torches to the site of the Games, where the final torch is used to light a cauldron. The games are declared open officially by kindling the torch and the flame remains lit until it is extinguished in the Closing Ceremony. Remember, the runners do not pass the same torch; only the flame is passed on to the next torchbearer. Each runner is allowed to keep their torch.



The first such relay took place for the 1936 Berlin Games when 3,331 runners carried the flame through Greece, Bulgaria, Yugoslavia, Hungary, Austria,

Czechoslovakia, and Germany. Similar relays have taken place for every Summer Games since. The flame travels by plane between cities, and is relayed by foot within cities. Being a torchbearer is considered an honour, and is often given to local residents with a record of community service, in addition to athletes and celebrities. Since 1964, the Winter Games have also had a torch relay starting in Olympia.

2.4.8 RELEASE OF DOVES

In 2014, one leg of the torch relay took place in space as two Russian cosmonauts carried the torch outside the International Space Station, some 200 miles above Earth.

After the cauldron is lit, doves are released into the air, as a symbol of peace. This was first done in the 1896 Olympics, and then in the 1920 Olympics. Since 1920, this has been an official part of the Opening Ceremony of the Summer Games. They are



generally not released during the Winter Games, because it's too cold for the birds, but symbolic substitutions, like white balloons, are some times used.

The order—first lighting the cauldron, then releasing the doves—is important. In the 1988 Seoul Games, when it was tried the other way around, many of the doves were in the area of the cauldron just before it burst into flames, leading to their unexpected demise.

2.4.9 THE ATHLETES' OATH

The Olympic Oath is taken by one athlete and one judge from the home nation, during the Opening Ceremony, on behalf of all the competitors and judges. Since 1984, this has been taken while holding a corner of the Olympic flag. Before that, the national flag of the home nation was used.

The oath was first taken by an athlete in 1920. Originally, this was primarily a declaration that all the athletes were amateurs. The wording has been revised over the years, as being an amateur is no longer a general requirement. In 2000, a specific reference to doping was added. The current oath is "In the name of all the competitors I promise that we shall take part in these Olympic Games, respecting and abiding by the rules which govern them, committing ourselves to a sport without doping and without drugs, in the true spirit of sportsmanship, for the glory of sport and the honour of our teams."

First time the Olympic oath was taken in 1920 at Antwerp, Belgium by Victor Bo in on behalf of all the athletes who participated in the Olympic Games. The Official's oath was introduced in 1972 and the coach's oath was added in 2010. It is a promise made by an athlete, judge or official in each of the Olympic Games and is usually said in the language of host country.

2.4.10 OLYMPIC AWARDS

The winners at the Olympic Games are awarded medals. The winner gets a gold medal, the runner up receives a silver medal and the second runner up receives a bronze medal in the awards ceremony on the podium. Participants from first to eighth receive a diploma and all participants receive commemorative medals. The National Anthem of the country of the winner is played during the ceremony.

When Modern Olympic Games began in 1896, the winners were given a silver medal and an olive branch, while runners- up received a laurel branch and a copper or bronze medal. In 1900, most winners received cups or trophies instead of medals. The custom of the sequence of gold, silver, and bronze for the first three places dates from the 1904 Summer





Olympics in St. Louis, Missouri in the United States. The International Olympic Committee (IOC) retroactively assigned gold, silver and bronze medals to the three best placed athletes in each event of the 1896 and 1900 Games.

Extension Activity

Each Olympic Games has its own medal design. From 1928-2004, the front side of every Olympic Games medal carried an image of Nike, the Greek goddess of victory, the Olympic Rings, the Coliseum of ancient Athens, a Greek vase known as an amphora, a horse-drawn chariot, and the year, number of the Olympiad, and host city. However, a new design was created for the 2004 Games, which featured the Greek Panathenaic Stadium and a new image of Nike. Each host city has allowed to add special details to the other side that is to the Games.

Design a medal for the Olympic Games if they were to be held in your town.

Medal designs have varied considerably since the first Olympic Games in 1896, particularly in size and weight. However, the IOC has laid down the physical properties of the medals and has the final decision about the finished design though the medals are developed by the National Olympic Committee (NOC) of the country hosting the Games.

Recipients: The top three competitors receive medals

Shape: Usually circular, featuring an attachment for a chain or ribbon
Diameter: A minimum of 60mm

Thickness: A minimum of 3mm

Material: First place (Gold medal): It is composed at least 92.5% of silver, plated with 6 grams of gold.

Second place (Silver medal): 92.5 % silver.

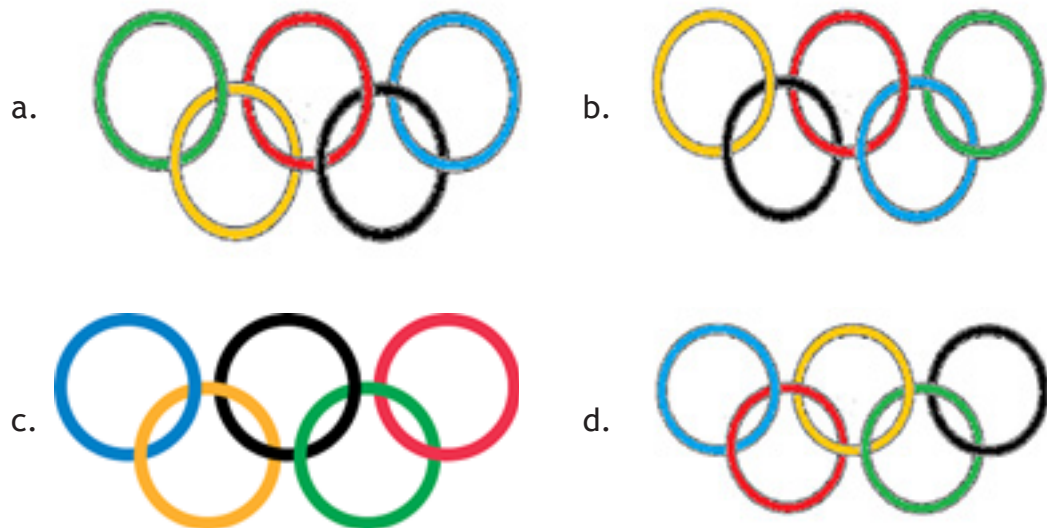
Third place (Bronze medal): It is 97.0% copper with 0.5% tin and 2.5% zinc.

Event details: The sport for which the medal has been awarded should be written on the medal.



I. Tick the correct option.

1. Which of the following is the Olympic symbol?



2. The word "Altius" in the Olympic motto means

- i. Faster
- ii. Higher
- iii. Heavier
- iv. Stronger

3. The logo of Olympic Games was created by

- i. Eunice Kennedy Shriver.
- ii. Deion Nash
- iii. Guttmann
- iv. Baron Coubertin

4. The first Olympic torch was lit in

- i. 1896, Athens, Greece
- ii. 1920, Antwerp, Belgium
- iii. 1924, Paris, France
- iv. 1928, Amsterdam, Netherlands





5. The Olympic flag was used for the first time
 - i. 1896, Athens, Greece
 - ii. 1920, Antwerp, Belgium
 - iii. 1924, Paris, France
 - iv. 1928, Amsterdam, Netherlands

II. Answer the following questions briefly.

- a. write a short note on Olympic creed.
- b. What is the motto of the Olympic Games? What does it mean?
- c. Write a short note on the Olympic flag.
- d. Describe the Olympic oath.

III. Answer the following questions in 150-200 words.

1. Write a note on the symbols and ideals of the Olympic Games.

2.5.1 OLYMPIC MOVEMENT STRUCTURE

Under the supreme authority and leadership of the International Olympic Committee, the Olympic Movement encompasses organisations, athletes and other persons who agree to be guided by the Olympic Charter. The goal of the Olympic Movement is to contribute to building a peaceful and better world by educating youth through sport practised in accordance with Olympism and its values. The three main constituents of the Olympic Movement are:

the International Olympic Committee ("IOC"),

the International Sports Federations ("IFs")

the National Olympic Committees ("NOCs").

In addition to its three main constituents, the Olympic Movement also encompasses the Organising Committees for the Olympic Games ("OCOGs"), the national associations, clubs and persons belonging to the IFs and NOCs, particularly the athletes, whose interests constitute a fundamental element of the Olympic Movement's action, as well as the judges, referees, coaches and the other sports officials and technicians. It also includes other organisations and institutions as recognised by the IOC. Any person or organisation belonging in any capacity whatsoever to the Olympic Movement is bound by the provisions of the Olympic Charter and shall abide by the decisions of the IOC.





2.5.2 INTERNATIONAL OLYMPIC COMMITTEE

The International Olympic Committee (IOC) was constituted by Pierre de Coubertin on 23 June 1894 with Demetrios Vikelas as its first president. It is a non-governmental and non-profitable organization situated in Lausanne, Switzerland. The object of the IOC is to fulfil the mission, role and responsibilities as assigned to it by the Olympic Charter. English and French are the official languages of the IOC. It is an official and supreme authority to spread Olympic movement worldwide through International Sports Federations, National Olympic Committees, Organising Committees for the Olympic Games, United Nations etc. It reserves the right on Olympic Games, the symbols and other elements which are related with the Olympic Movement.

The Committee organizes Summer and Winter Olympic Games that were started in Athens, Greece in 1896 and Chamonix, France in 1924 respectively. Before 1992 Winter and Summer Olympics were conducted the same year, but after 1992, IOC changed the schedule of the Olympics Games. Now, while Summer Olympics take place every leap year, Winter Olympics take place two years later, in even years. For example, while Summer Olympic Games were held in 2000, Sydney, Australia and in 2004, Athens, Greece, Winter Olympic Games were held in 2002, Salt Lake City, USA and 2006 Turin, Italy. IOC also organizes the Youth Olympic Games (YOG), held in summer and winter, every four years. The first Summer YOG were in Singapore in 2010 and the first Winter YOG in Innsbruck in 2012.

United Nations General Assembly declared IOC as a permanent observer in 2009. The decision enables the IOC to be directly involved in the UN Agenda and to attend UN General Assembly meetings where it can take the floor. In 1993, the General Assembly approved a Resolution to further solidify IOC-UN cooperation by reviving the Olympic Truce.

2.5.2.1 MISSION AND ROLE OF INTERNATIONAL OLYMPIC COMMITTEE

As per Olympic Charter, the mission of the IOC is to promote Olympism throughout the world and to lead the Olympic Movement.

The IOC's role is:

1. To encourage and support the promotion of ethics and good governance in sport as well as education of youth through sport and to dedicate its efforts to ensuring that, in sport, the spirit of fair play prevails and violence is banned.
2. To encourage and support the organisation, development and coordination of sport and sports competitions.





3. To ensure the regular celebration of the Olympic Games.
4. To cooperate with the competent public or private organisations and authorities in the endeavour to place sport at the service of humanity and thereby to promote peace.
5. To take action to strengthen the unity of the Olympic movement, to protect its independence, to maintain and promote its political neutrality and to preserve the autonomy of sport.
6. To act against any form of discrimination affecting the Olympic movement
7. To encourage and support elected representative so athletes with in the Olympic movement, with the IOC athletes' commission acting as their supreme representative on all Olympic games and related matters.
8. To encourage and support the promotion of women in sport at all levels and in all structures with a view to implementing the principle of equality of men and women;
9. To protect clean athletes and the integrity of sport, by leading the fight against doping, and by taking action against all forms of manipulation of competitions and related corruption.
10. To encourage and support measures relating to the medical care and health of athletes.
11. To oppose any political or commercial abuse of sport and athletes.
12. To encourage and support the efforts of sports organisations and public authorities to provide for the social and professional future of athletes.
13. To encourage and support the development of sport for all.
14. To encourage and support a responsible concern for environmental issues, to promote sustainable development in sport and to require that the Olympic games are held accordingly.
15. To promote a positive legacy from the Olympic games to the host cities and host countries.
16. To encourage and support initiatives blending sport with culture and education
17. To encourage and support the activities of the International Olympic Academy (IOA) and other institutions which dedicate themselves to Olympic education.

2.5.2.2 ORGANIZATION AND SETUP OF INTERNATIONAL OLYMPIC COMMITTEE

The powers of the International Olympic Committee are exercised through the following three organs:

The Session

The IOC Executive Board

The President

The Session: The Session is the general meeting of the members of the IOC. It is the IOC's supreme organ. Its decisions are final. An ordinary Session is held once a year. Extraordinary Sessions may be convened by the President or upon the written request of at least one third of the members. Every member has right of one vote. The main decisions like choosing city for Olympic games sports Programmes, electing new members etc. are taken in the session and its decisions are final.

Powers of the session are:

1. to adopt or amend the Olympic Charter;
2. to elect the members of the IOC, the Honorary President, honorary members and honour members;
3. to elect the President, the Vice-Presidents and all other members of the IOC Executive Board;
4. to elect the host city of the Olympic Games;
5. to elect the city in which an ordinary Session is held, the President having the authority to determine the city in which an extraordinary Session is held;
6. to approve the annual report and financial statements of the IOC;
7. to appoint the independent auditor of the IOC;
8. to decide on the awarding or withdrawal by the IOC of full recognition to or from NOCs, associations of NOCs, IFs, associations of IFs and other organisations;
9. to expel IOC members and to withdraw the status of Honorary President, honorary members and honour members;
10. to adopt or amend the Athletes' Rights and Responsibilities Declaration upon recommendation of the Athletes' Commission and to promote respect for this Declaration within the Olympic Movement;
11. to resolve and decide upon all other matters assigned to it by law or by the Olympic Charter.

The **Quorum** required for a Session is half the total membership of the IOC plus one. Decisions of the Session are taken by a majority of the votes cast; however, a majority of two-third of the votes cast is required for any modification of the Fundamental Principles of Olympism, of the Rules of the Olympic Charter, or if elsewhere provided in the Olympic Charter.





Each member has one vote. Abstentions and blank or spoiled votes are not taken into consideration in the calculation of the required majority. Voting by proxy is not allowed. Voting is held by secret ballot when so required by the Olympic Charter, or if the Chairman so decides or upon the request of at least a quarter of the members present. In the event of a tie, the Chairman shall decide.

The Session may delegate powers to the IOC Executive Board.

The IOC Executive Board: The Executive board was founded in 1921 to manage the affairs of IOC. The Board consist of the President, four Vice-Presidents and ten members who are elected by the IOC members in the session by secret ballot by a majority of votes cast. The Executive Board undertakes overall responsibility for the administration and management affairs of IOC.

As per Olympic charter it performs following duties:

1. it monitors the observance of the Olympic Charter;
2. it approves all internal governance regulations relating to its organisation;
3. it establishes an annual report and the financial statements of the IOC in accordance with International Financial Reporting Standards and Swiss law, which it submits to the Session for approval together with the report of the auditor;
4. it submits a report to the Session on any proposed change of Rule or Byelaw;
5. it submits to the Session the names of the persons whom it recommends for election to the IOC;
6. it establishes and supervises the procedure for accepting and selecting candidatures to organise the Olympic Games;
7. it establishes the agenda for the Sessions;
8. upon the proposal of the President, it appoints - or dismisses - the Director General. The President decides on his compensation and may take sanctions;
9. it provides for the safe keeping of all minutes, financial statements and other records of the IOC in compliance with the law, including minutes of all Sessions, IOC Executive Board and other commission or working group meetings;
10. it takes all decisions, and issues regulations of the IOC, which are legally binding, in the form it deems most appropriate, such as, for instance, codes, rulings, norms, guidelines, guides, manuals, instructions, requirements and other decisions, including, in particular, but not limited to, all regulations necessary to ensure the proper implementation of the Olympic Charter and the organisation of the Olympic Games;

11. it organises periodic meetings with the IFs and with the NOCs at least once every two years. Such meetings are chaired by the IOC President, who determines the procedure and the agenda after consultation with the relevant bodies;
12. it creates and confers the honorary distinctions of the IOC;
13. it exercises all powers and performs all duties not attributed by law or by the Olympic Charter to the Session or to the President.

The President:

The President is elected by the IOC members in the session through secret ballot for a period of four years, which can be renewed for further four years. The President is the representative of IOC and is responsible for organization and preparation of all Executive meetings. He may give his power to the Director General. He can execute any action or decision on behalf of IOC. If the President is unable to fulfil his work, the senior Vice President can replace him.

2.5.3 THE NATIONAL OLYMPIC COMMITTEES (NOCs)

National Olympic committee (NOC) is a unit at national level of Olympic movement. There are 206 NOCs. The IOC is the sole authority to recognize a NOC. Together with the International Sport Federations, the NOCs are a constituent of the Olympic Movement under the leadership of the IOC. The mission of the NOCs is to develop, promote and protect the Olympic Movement in their respective countries, in accordance with the Olympic Charter. NOCs mission is to develop, promote and protect the Olympic Movement in their respective countries in accordance with Olympic charter. It was to promote fundamental principles, values of Olympism, Olympic educational programmes in their countries. It works to promote athlete to participate at apex level and give high performance by providing training and other logistics. NOCs also hold responsibility to send athletes in Olympic Games and may nominate their country cities to organize Olympic games.

In India, The Indian Olympic Association act as NOC which is a non-profit organization under the Societies Registration Act of 1860 founded by Sir Dorabji Tata as President and Dr A.G. Noehren as Secretary General in 1927. In the same year the association

was recognized by the International Olympic Committee. The prime objective of the Association was to promote and develop Olympic movement in India. In the early years, IOA selected sportspersons to represent India, but after 1947 they gave the responsibility of selection and training to the National Sports Federations. Now they only arrange transport, board and accommodation for officials and sports persons.



Sir Dorabji Tata





The Indian Olympic Association is the governing body for the Olympic Movement and the Commonwealth Games in India. It is also an affiliated member of the International Olympic Committee (IOC), Commonwealth Games Federation (CGF), Olympic Council of Asia (OCA) and Association of National Olympic Committees (ANOC). IOA is recognized by Ministry of Youth Affairs and Sports.

The IOA looks after several aspects of sports and sportspersons which includes sending athletes or teams to represent India in the Olympic Games, Commonwealth Games, Asian Games and other international multi-sport competitions of IOC, CGF, OCA and ANOC.

The members of the IOA include

- National Sports Federations affiliated to International Sports Federations whose sport is included in the Programme of the Summer and Winter Olympic Games.
- National Sports Federations affiliated to International Sports Federations whose sport is not included in the Programme of the Summer and Winter Olympic Games but is included in the Programme of all Asian and/or Commonwealth Games.
- Indian citizens who are member/s of the International Olympic Committee.
- Two (one male and one female) active athletes or retired athletes having taking part in the Olympic Games; subject to the condition that the retired athletes must retire from their post latest by the end of the third Olympiad after the last Olympic Games in which they took part.
- State Olympic Associations
- Union Territories' Olympic Associations
- Services Sports Control Board
- The National Federation of the Indian game Kho-Kho.

Extension Activity

Interview a member of the IOA or any Sports Federation of your State for your school Magazine.

2.5.4 THE INTERNATIONAL FEDERATIONS (IFS)

The International Sports Federations (IFs) are responsible for the integrity of their sport on the international level. The International Sports Federations are international non-governmental organisations recognised by the International Olympic Committee (IOC) as administering one or more sports at world level.



The national federations administering those sports are affiliated to them. While conserving their independence and autonomy in the administration of their sports, International Sports Federations seeking IOC recognition must ensure that their statutes, practice and activities conform with the Olympic Charter.

The IFs have the responsibility and duty to manage and to monitor the everyday running of the world's various sports disciplines, including for those on the programme, the practical organisation of events during the Games. The IFs must also supervise the development of athletes practising these sports at every level. Each IF governs its sport at world level and ensures its promotion and development. They monitor the everyday administration of their sports and guarantee the regular organisation of competitions as well as respect for the rules of fair play.

The IFs may formulate proposals addressed to the IOC concerning the Olympic Charter and the Olympic Movement in general, including the organising and holding of the Olympic Games; give their opinions concerning the candidatures for organising the Olympic Games, particularly concerning the technical capabilities of the candidate cities; collaborate in the preparation of the Olympic Congresses; and participate in the activities of the IOC commissions.

Association of Federations

In order to discuss common problems and decide on their events calendars, the summer federations, the winter federations and the recognised federations have formed associations: the Association of Summer Olympic International Federations (ASOIF), the Association of International Olympic Winter Sports Federations (AIOWF), and the Association of IOC Recognised International Sports Federations (ARISF).

I. Tick the correct option.

1. The IOA was established in
 - i. 1926
 - ii. 1927
 - iii. 1928
 - iv. 1930
2. What do you mean by NOC ?
 - i. National Olympic Committee
 - ii. National Olympic Congress
 - iii. National Olympic Course
 - iv. National Olympic Community





3. The IOC Executive Board has _members.
 - i. 1
 - ii. 2
 - iii. 8
 - iv. 10
4. Which is not a member of Association of Federations?
 - i. the Association of Summer Olympic International Federations (ASOIF)
 - ii. the Association of International Olympic Winter Sports Federations (AIOWF)
 - iii. the Association of Paralympic Sports Federations (APSF)
 - iv. the Association of IOC Recognised International Sports Federations (ARISF)

II. Answer the following questions briefly.

1. Write a short note on the Olympic Flag.
2. From where and how is the Olympic torch brought to the host city?
3. List the office bearers of the IOC.
4. Describe the Olympic oath.
5. Describe the formation of the IOA.

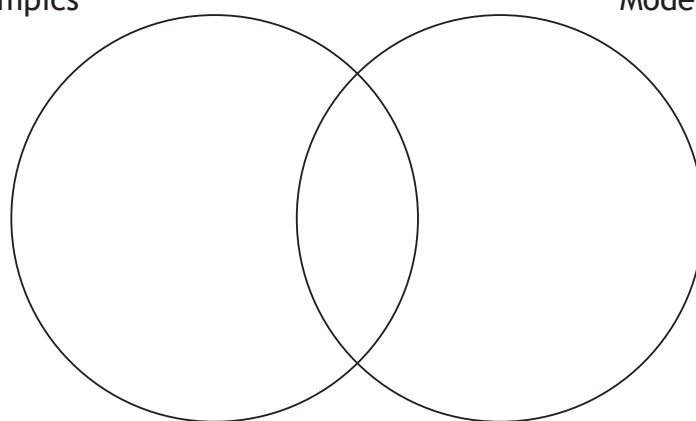
III. Answer the following questions in 150-200 words.

1. Describe the organizational step-up of International Olympic Committee.
2. Differentiate between Modern and Ancient Olympic Games.

IV. Complete the Venn Diagram given below listing the similarities and differences between Ancient and Modern Olympic Games.

Ancient Olympics

Modern Olympics



Differences

Similarities

Differences

V. Case Study

Olympism



While introducing the chapter Olympism in physical Education class Mr Davis found that children were not familiar with the term and were clueless about the various committees working in this field. So he explained in detail about IOC and various information related to it were discussed. On the basis of ur knowledge about IOC answer the following questions

- What is the full form of IOC?
- When was the IOC established?
- Where is the headquarter of IOC?
- How many active members are there of IOC?
- List down any three functions of IOC?

VI. Art Integration

ART INTEGRATION

Olympic mascots have been a key part of the Games since 1968. They're tasked with giving concrete form to the Olympic spirit, spreading the values highlighted at each edition of the Games, promoting the history and culture of the host city and giving the event a festive atmosphere.




Imagine India is hosting the 2032 Olympic Games.

Design a mascot for the Games. In a brief presentation, explain your choice of mascot.





Weblinks

Topic	Weblinks	QR Code
Olympic Value Education: IOC	https://olympics.com/ioc/education/olympic-values-education-programme#:~:text=What%20is%20OVEP%3F,the%20core%20principles%20of%20Olympism.	
Olympic Movement	https://olympics.com/ioc/olympic-movement	
Olympic History	https://olympics.com/ioc/overview	



UNIT 3

YOGA



Content

Meaning & Importance of Yoga

Introduction to Ashtanga Yoga

Yogic Kriyas (Shat Karma)

Pranayama and its types

Active Lifestyle and stress management through Yoga





Learning Outcomes

At the end of this unit students will be able to:

- recognize the concept of yoga and aware with the importance of it
- identify the elements of yoga
- identify the Asanas, Pranayamas, meditation and yogic kriyas
- classify various yogic activities for enhancement of concentration
- know about relaxation techniques for improving concentration



Discussion

Read the newspaper clipping given below.

International Yoga Day

New Delhi: International Day of Yoga (IDY), Yoga day or Antarashtriyā Yog Divas is an annual event celebrated all over the world on June 21 since its inception in 2015. The idea of IDY was first proposed by Indian Prime Minister during his speech at the United Nations General Assembly (UNGA), on September 27, 2014.

Later, International Day of Yoga (IDY) was declared unanimously by the United Nations General Assembly (UNGA) on December 11, 2014. Yoga is a physical, mental and spiritual practice that has its roots mostly in India. The date of June 21 was suggested by PM Modi in his UN address as it is the longest day of the year in the Northern Hemisphere and is highly important in many parts of the world. Last year, 72 students and teachers from City Montessori School of Lucknow performed yogic exercises at the United Nations Headquarters in New York on the occasion of International Day of Yoga.

In 2018, PM Modi participated in the event organised in FRI Dehradun. As many as 60,000 people are expected to turn up for the event.

Discuss in your group

- How does yoga contribute to an individual's growth, development, health and
- fitness?
- Why was June 21 chosen as IDY?
- What are the objectives of IDY?

Present your ideas to the class.

3.1.1 MEANING, DEFINITION AND IMPORTANCE OF YOGA

Meaning

The word 'yoga' is derived from a Sanskrit word "yuj", which means union. Yoga is the union of the spirit with the soul. This union is a long process which may even take several births, according to Hindu scriptures. Yoga is also considered as the union of the Ida nerve with the Pingla nerve, of the sun nerve with the moon nerve, of negative and positive, of Shiva (spirit) with Shakti (mother nature), and of Mooladhar Chakra (Coccyx plexus) with the Sahasrar Chakra (thousand lotus petal plexus). Yoga is the union of Prana Vayu with the Apan Vayu (life current with excretion current.)





Yoga is a science of experiencing which helps in the upliftment of humanity, from animal-hood to God-hood. This science helps bring happiness in our lives. It is the path of spiritual connection which serves as a remedy for doubt, confusion and intellectual dissatisfaction. Consciousness added to matter and life, gives an animal. Self- consciousness added to the mixture gives a human being; the addition of pure joy creates a God.

Yoga is not merely a means to treat diseases. Rather, it is a science which brings health and happiness on causal, astral and physical planes. All the religions of the world speak of the divine union of soul and spirit in one way or the other.

This union can be achieved through any means but yoga, as propounded by Maharishi Patanjali, is the fastest and most effective way.

DEFINITION

- Stillness in the whirlpools (modifications) of the mind (Yoga Chitta Vritti nirodha) - Maharishi Patanjali.
- Skillness in action (Yogah karmasu kaushalam) - Lord Krishna in Bhagavad Gita.
- A skillful and subtle process to calm the mind (Yoga Vasistha).
- "Yoga is said to be the oneness of breath, mind, and senses, and the abandonment of all states of existence."- (Maitri Upanishad)
- "Yoga is said to be the unification of the web of dualities." (Dvandva Jaala).- Yoga Bija
- "Yoga is said to be in control."- (Brahmaanda Purana)
- "A skillful and subtle process to calm down the mind." - Yoga Vashistha



Yoga explained by Ministry of AYUSH

Do you know?

In the modern era, Swami Vivekananda, introduced the importance of Yoga to the Western world, when he addressed the World Parliament of Religions at Chicago in 1893.

Swami Vivekananda is also credited for being the greatest proponent of Yoga in the West.



3.1.2 IMPORTANCE OF YOGA

Yoga is not a religion, but a way of living that ensures 'a healthy mind in a healthy body'.

Man is a physical, mental and spiritual being; yoga helps to promote a balanced development of all the three. Other forms of physical exercises, like aerobics, assure only physical wellbeing. They have little to do with the development of the spiritual or astral body.

Extension Activity Discuss with your group

- What are the short-term effects of yoga?
- What changes take place in your body if you do yoga regularly over an extended period of time?
- Are these changes obvious - relating to visible changes in your body e.g., building up of muscles, loss of body fat etc.?
- What changes occur in heart rate and breathing?
- What about changes that are not so obvious and are long-term - increased stamina, improved flexibility?

Design a poster to show the effect of yoga on the body.

You could use an outline of the body to show which parts of the body are affected, what those effects are and how to maximize benefits of exercise.

Yogic exercise recharges with cosmic energy. This facilitates

- Attainment of perfect equilibrium and harmony.
- Promotes self-healing.
- Removes negative blocks from the mind and toxins from the body.
- Enhances personal power.
- Increases self - awareness.
- Helps in attention, focus and concentration, especially for children.
- Reduces stress and tension in the body by activating the parasympathetic nervous system.
- Yoga bestows upon every aspirant the power to control the body and mind.





I. Tick the correct option.

1. Word 'Yoga' derived from:
 - a. Yuj
 - b. Yug
 - c. Yua
 - d. Yuy
2. Who define yoga as "Skillness in action"?
 - a. Maharishi Patanjali
 - b. Brahmaanda Purana
 - c. Lord Krishna
 - d. Maitri Upanishad

II. Answer the following questions briefly.

1. What do you mean by term 'Yoga'.
2. How can yoga contribute in enhancing personal power?

III. Answer the following questions in 150-200 words.

1. How can Yoga help in maintaining healthy lifestyle?
2. Explain the modern concept of yoga along with importance?

3.2.1 INTRODUCTION TO ASHTANG YOGA

Yoga is more than just a physical discipline. It is a way of life-a rich philosophical path. And the yamas (social restraints) and niyamas (self-discipline) are ten good common-sense guidelines for leading a healthier, happier life and for bringing spiritual awareness into a social context. They are for the individual to think about and ponder over with a rational mind, because yoga is not about mindlessly accepting externally imposed rules - it is about finding the truth for oneself and "connecting" with it.

3.2.2 Yamas: Yama is the first "limb" of Ashtang Yoga.

The 5 yamas are universal practices that help us move forward in our personal and spiritual development. The five yamas ask practitioners to avoid violence, lying, stealing, wasting energy, and possessiveness.





The five yamas, or codes of conduct or moral disciplines towards the outside world are:

- a) Ahimsa – Sanskrit for “non-harming”
- b) Satya – Sanskrit for “refraining from dishonesty”
- c) Asteya– Sanskrit for “non-stealing”
- d) Brahmacharya – Sanskrit for “wise use of vitality”
- e) Aparigraha– Sanskrit for “non-possessiveness”

Practicing Yoga’s “golden rules” helps us attain a healthy mind and body, and it is important to follow the yamas without the desire for an end goal.

- a) **Ahimsa (non-violence):** Ahimsa means practicing kindness towards others, towards animals and towards ourselves in every thought and action. When we are compassionate and accepting of all ways of life we can handle any situation with grace.
- b) **Satya (refraining from dishonesty)** Satya is the principle of living with integrity. Satya refers to refraining from dishonesty and betrayal in thought, word, and deed. It is important to note, though, that ahimsa is still the most important principle. Thus, in case truth can cause harm or violence, the option to be exercised is one that will not cause harm.
- c) **Asteya (non-stealing):** Asteya teaches that everything we need in life is already within us. By choosing Asteya, we rise above our “base cravings” and become self-sufficient because we no longer desire something outside of ourselves. Feeling gratitude for what we have, and only taking what is freely given, makes it easy to wipe out feelings of envy or entitlement, and for authentic generosity.
- d) **Brahmacharya (wise use of energy)** Brahmacharya refers to the wise use and preservation of vitality. It does not mean celibacy, but rather acting responsibly with your vitality, as a way to respecting others and yourself.
- e) **Aparigraha (non-possessiveness)** Aparigraha refers to the ability to let go. It encourages non-grasping, non-clinging, and non-attachment to possessions or even thoughts. Aparigraha teaches you not to take it easy and be happy with what you have.





3.2.3 Niyamas

The niyamas, the second constituent of Asthang Yoga, deal with the manner in which we interact with ourselves and our internal world. Following the Niyamas helps the individual regulate her/his behaviour and maintain a positive environment in which to grow. Energy generated through the cultivation of the yamas is harnessed through the practice of the Niyamas. While Sage Yajnavalkya lists ten niyamas and the Bhagavad Gita lists 11, Patanjali names the following five:

- a) Saucha or purity
 - b) Santosha or contentment
 - c) Tapa or austerity
 - d) Swadhyaya or self-education, and
 - e) Ishwar Pranidhan or meditation on the Divine.
- a) Saucha implies both external as well as internal purity. According to Manu, just as water purifies the body, truthfulness the mind and true knowledge the intellect, the soul is purified by knowledge and austerity. It advocates the practices of intellectual purity, purity of speech and of the body.
- b) Santosha or contentment is the second niyama, which is described as not desiring more than what one has earned through honest labour. Santosha implies that the state of mind does not depend on any External causes, and that one must maintain equanimity through all that life offers. Santosha involves the practice of gratitude and joyfulness - maintaining calm at all costs.
- c) Tapa or Austerity, the third niyama, is described in the philosophy of yoga as the power to stand thirst and hunger, cold and heat, discomforts of place and postures, silent meditation and fasts. It also maintains that the perfect man is he who practices both mental as well as physical austerity.

Do you know?

Maharishi Patanjali is a saint who is believed to have lived some time during the 2nd century BCE. He is known for his treatise on Yoga, entitled "Patanjali Yoga Sutra".

- d) Swadhyaya or self-education, according to the commentator Vyas, consists of scriptural studies - the study of the Vedas and Upanishads together with the recitation of the Gayatri Mantra and the Om Mantra.



- e) Ishwar Pranidhan, the last of the niyamas, is described as the dedication of all our actions, performed either by intellect, speech or body, to the Divine. The results of all such actions are, therefore, dependent upon Divine decision. The mortal mind can simply aspire to realize the Divine through dedication, purification, tranquillity and concentration of the mind. This Divine contemplation spills over into all aspects of the yogi's life.

3.2.4 Benefits of Practicing Yamas & Niyamas

The yamas and niyamas help in managing our energy in an integrated manner, complementing our outer life to our inner development. They help us view ourselves with compassion and awareness. They help in respecting the values of life, in balancing our inner growth with outer restraint. In short, Yamas and Niyamas are not about right and wrong, but are about being honest with oneself. Living according to these principles is about living our lives in a better way, and moving towards connecting with the Divine.

3.2.5 Asanas

Asana is a posture in harmony with one's inner consciousness. It aims at the attainment of a sustained and comfortable sitting posture to facilitate meditation.

Asanas also help in balancing and harmonizing the basic structure of the human body, which is why they have a range of therapeutic uses too.

3.2.5 Pranayama

Pranayama is a compound term (Prana and Yama) meaning the maintenance of prana in a healthy manner throughout one's life. More than being merely a breath-control exercise, Pranayama is the art of the life force or prana. Ancient yogis, who understood the essence of prana, studied it and devised methods and practices to master it. These practices are better known as Pranayama since breath or prana is basic to life, the practice of Pranayama helps in harnessing the prana in and around us, and by deepening and extending it, Pranayama leads to a state of inner peace. According to Hatha Yoga, Pranayamas can be classified under:

- a) Surya Bhedi
- b) Ujjai
- c) Sitkari
- d) Sitli





- e) Bhastrika
- f) Bhramari
- g) Murchha, and
- h) Kewali.

3.2.6 Pratyahara

Pratyahara is the “withdrawal of the senses” and it is the fifth element among the eight stages of Patanjali’s Ashtang Yoga, as mentioned in his classical work. It is also the first stage of the six-branch yoga of the Buddhist Kalachakra tantra, where it refers to the withdrawal of the five senses from external objects to be replaced by the mentally created senses of an enlightened deity.

3.2.7 Dharana

The last three limbs of Ashtang Yoga are the three essential stages of meditation. Dharana involves developing and extending our powers of concentration. This consists of various ways of directing and controlling our attention and mind - fixing skills, such as concentrating on the chakras or turning inwards.

3.2.8 Dhyana

Dhyana is the state of meditation, when the mind attains a state of concentration without getting distracted. Strictly speaking, unlike the other six limbs of yoga, this is not a technique but rather a state of mind, a delicate state of awareness, where the mind has been quieted, and, in the stillness, it produces few or no thoughts at all. This state rightfully precedes the final state of Samadhi.

3.2.9 Samadhi

Samadhi or total absorption is the ability to become one with the true self and merge into the object of concentration. In this state of mind, the perceiver and the object of perception unite through the very act of perception-a true unity of all thought and action. This is the acme of all yogic endeavours, the ultimate “yoga” or connection between the individual and the universal soul.

Do you know?

According to Hindu mythology, Shiva is considered the Supreme Lord of Yoga.



I. Tick the correct option.

1. There are eight stages of training for a yogi to go through in order to reach “moksha” (release). What is the final stage called?
 - i. Samadhi
 - ii. Yama
 - iii. Pranayama
 - iv. Kaivalya
2. Yama and Niyama are part of
 - i. physical growth
 - ii. charity
 - iii. meditation
 - iv. morality and ethics
3. Out of the following which one is NOT Ashtang Yoga?
 - i. Yama
 - ii. Niyama
 - iii. Dhauti
 - iv. Pratyahar
4. To stabilize and focus the mind on one object, image, sound or idea is called
 - i. i. Dharana
 - ii. ii. Dhyana
 - iii. iii. Samadhi
 - iv. iv. Pratyahara

II. Answer the following questions briefly.

1. Differentiate between Dhyana and Samadhi.
2. Explain the concept of Pranayama.

III. Answer the following questions in 150-200 words.

1. What are the purpose of Ashtang Yoga?
2. Explain the components of Ashtang Yoga.





3.3.1 YOGIC KRIYAS (SHAT KARMAS): MEANING, PROCEDURE, PRECAUTIONS AND BENEFITS

According to tridosha theory (one of the fundamental theories of Indian medicine), the human body is made by three basic constituents called tridoshas, which are Vata (mechanical functional constituent of the body), Pitta (chemical functional constituent of the body) and Kapha (material functional constituent of the body). If there is any imbalance in the constituents of the body, it leads to diseases. Yoga recommends six purification processes to get and keep the equilibrium of these tridoshas. They are known as Shat kriyas (six purification processes). They are:

1. Kaphalabhati - Purification of frontal lobes and lungs.
2. Trataka - Blinkless gazing.
3. Neti - Nasal cleansing.
4. Dhauti - Cleaning of digestive track and stomach.
5. Nauli - Abdominal massage.
6. Basti - Colon cleaning.

These six cleansing processes are excellent practices designed to purify the whole body, and to get good health. Nauli and Dhauti are higher practices, hence not mentioned here.

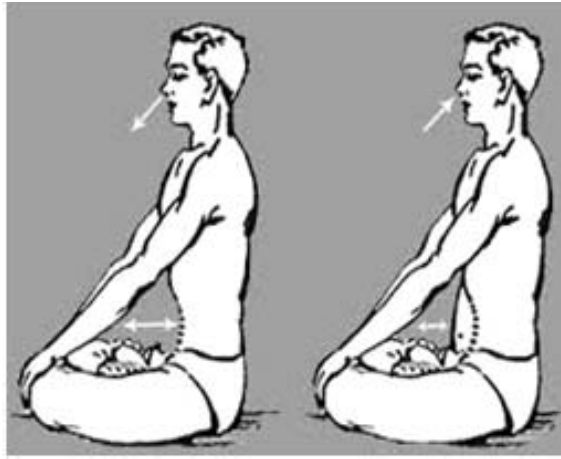
Do you know?

Tao Porchon-Lynch, born on August 13, 1918, is an American yoga master and award-winning author of French and Indian descent. She discovered yoga in 1926 when she was eight years old in India and studied with, among others, Sri Aurobindo,

B.K.S. Iyengar, K. Pattabhi Jois, Swami Prabhavananda, and Maharishi Mahesh Yogi. At age 100, she teaches six to eight classes a week in New York, and leads Programmes across the globe. She is the author of two books, including her autobiography, *Dancing Light: The Spiritual Side of Being Through the Eyes of a Modern Yoga Master*, which won a 2016 IPPY Award and three 2016 International Book Awards.

3.3.2 KAPALABHATI

This involves forceful and fast diaphragmatic breathing. In a comfortable sitting position, one exhales forcefully by contracting the abdomen and inhales. The exhalations and inhalations are accompanied with the abdominal movements which take place in quick successions for a number of times depending on one's capacity.



BENEFITS

- This is a great cleanser for the respiratory passages including the sinuses.
- It improves respiratory function and promotes circulation.
- Improves balance.
- It removes acidity and gas related problems.
- It cures sinus, asthma, and hair loss.

PRECAUTIONS

- a. Pregnant women, patients suffering from a slipped disc, and asthma patients should avoid it.
- b. It should not be performed during menstruation.

3.3.3 TRATAKA

It is still-gazing at a point selected in the form of a black dot on a paper, or an unwavering flame or any other object of choice. One has to continue still-gazing until tears roll down.





BENEFITS

- It improves the eyesight and tones up the visual mechanism.
- It also helps in concentration.
- It helps to calm the mind and remove distractions.

PRECAUTIONS

- People suffering with epilepsy should not practice trataka on candle.
- Kids should avoid practicing trataka.

3.3.4 NETI

Neti is the yogic system of body cleansing techniques. It is intended to mainly clean air passages in the head.

JALNETI

Jal Neti is a technique used by yogis to stay away from diseases, and most importantly to use the breath well for their yogic practices without any blockages.



TECHNIQUE

- In a feeding cup or a small pot having a nuzzle, take tepid water with a little salt added to it.
- Insert the nozzle in one of the nostrils.
- Bend the head a little sideward and pour water slowly into the nostril.
- Then repeat the same procedure with other with the other nostril. Thus, the nasal cavity is cleansed with water.



BENEFITS

- Jal Neti removes excess mucus and impurities in the nose.
- It reduces inflammatory conditions and builds up resistance in the atmosphere.
- Helps in preventing cold and cough.
- If practiced daily, can cure headache and migraine.

3.3.5 DHAUTI

Dhauti is a word in Hindi which means washing. Hence all the kriyas which involve washing can be said as dhauti kriya.

VAMANA DHAUTI



In Sanskrit, Vamana means 'middle' and Dhauti means 'purification'. In the yogic literature, this technique is known also as KUNJALA, or the gesture of the elephant. It is one of the six purification methods of shat karma of hatha yoga.

TECHNIQUE

- Drink tepid water as much as possible filling the stomach completely.
- If desired add some common salt for taste.
- Insert three fingers into the throat and tickle it to vomit out the water.
- Do it again and again until all water is thrown out.

BENEFITS

- It removes all the contents of the stomach including excess secretions of the stomach and undigested food.
- It removes gas, acidity and indigestion.
- It helps to cure cough and sore throat.





Extension Activity

Perform Kaphalabhati for 8 consecutive days and write 3 changes which take place in you after 8th day.

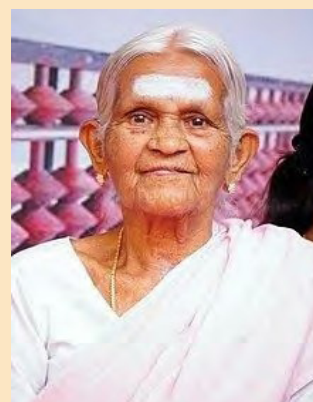
Name of the Asana	Change 1	Change 2	Change 3

Do you know?

India's oldest Yoga teacher

99 year old V. Nanammal is India's oldest Yoga teacher who comes from Coimbatore, Tamil Nadu, India. Nanammal, who has trained one million students over 45 years, teaches 100 students daily. 600 of her students have become Yoga instructors around the world.

Her work has been honoured with India's National Nari Shakti Puraskar in 2016 and the country's fourth highest civilian award, the Padma Shri, in 2018.



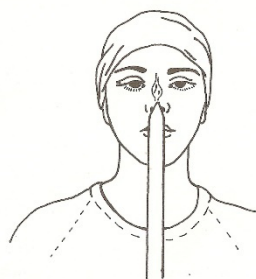
I. Tick the correct option.

- is a very good Kriya to get rid of nasal allergy?
 - Vastradhauti
 - Dandadhauti
 - Neti
 - Kapalbhati
- Cleaning of Colon is known as:
 - Nauli
 - Basti
 - Neti
 - Trataka
- Other name of Vamana dhauti is :
 - Kunjala
 - Kapalbhati
 - Vastradhauti
 - Dandadhauti



4. Identify which yogic Kriya is being performed in following picture?

- a. Nauli
- b. Basti
- c. Neti
- d. Trataka



II. Answer the following questions briefly.

- 1. Define yogic kriyas.
- 2. Elucidate the procedure and benefits of trataka
- 3. Explain yogic cleansing techniques for nasal cavity.

III. Answer the following questions in 150-200 words.

- 1. Describe the yogic kriyas along with benefits.
- 2. What is the effect of Kriyas on our body?

3.4.1 PRANAYAM AND ITS TYPES

Pranayama forms an important component of Yogic Practice. Pranayama is a science which helps to regularize vital energies through the regulation of breathing. The main purpose of Pranayama is to gain control over the Autonomous Nervous System and mental functions.

Pranayama practice involves slow deep inhalation (Puraka), holding breath (Kumbhaka) and near complete exhalation (Rechaka).

The flow of Prana or vital energy to all the vital parts of the body is regulated by these breath-regulating practices. Regular practice of Pranayama can modulate the sensitivity of chemo-receptors and can also make the mind calm and quiet.

These are the Pranayama mentioned in the Hatha Yoga Texts.

- a. Anulom- vilom
- b. Suryabhedana,
- c. Ujjayi,
- d. Bharmari,
- e. Sheetkari,
- f. Sheetal,





Nadishodhan or Anulom-vilom, Suryabhedan, Ujjayi, Sheetli, Bhramari, Pranayama are important pranayamas to be practiced.

Before doing the above pranayamas, one must follow the essentials for practicing them as stated below:

External environment:- Any place that is well- ventilated and free from noise, insects and flies should be preferred to practice pranayamas.

1. Right season to begin the practice of Pranayama: One should start to practice Pranayama in spring season i.e. March-April and autumn season i.e. Sept- Oct. One who is already in practice should continue its practice.
2. Right time: - Morning is the time best suited to practice Pranayamas.
3. Seat or Asana: - The seat should be soft, thick and comfortable.
4. Asana: - Asanas such as Padmasana, Siddhasana, Vajrasana and Sukhasana are considered the most suitable postures for the practice of pranayama.

3.4.2 ANULOM-VILOM OR NADI SHODHANA PRANAYAMA

This is one of the fundamental types of Pranayamas. This practice is also known as Anuloma-viloma as Viloma means 'produced in the reverse order'. This practice gets the name from the fact that the order of using the nostrils for inhalation and exhalation is reversed from time to time.



Technique

1. Sit in any comfortable asana. Keep the head and spine straight. The eyes should be closed.
2. Place right hand in jnana mudra. Close the right nostril with the right thumb. Inhale through the left nostril for 5 counts.

3. After 5 counts of breath, release the pressure of thumb from the right nostril and close the left nostril with the ring finger.
4. Exhale through the right nostril for 10 counts, keeping the respiration rate slow, deep and silent. Then, inhale through the right nostril for 5 counts.
5. Exhale 5 rounds of practice or for 3 to 5 minutes, making sure that no sound is produced as the air passes through the nostrils.

Benefits

1. Calms and steadies the mind, improves focus and concentration. Balances left and right hemispheres.
2. Strengthens the immune system.
3. Manages hypertension.
4. Provides sufficient oxygen for the functioning of every cell in our body.
5. Removes waste products such as carbon dioxide and other toxic gases from the body, so that they do not remain in the blood stream.

3.4.3 SURYA BHEDHANA PRANAYAMA

Surya is the sun and bhedhana means to get through. In Surya Bhedhana Pranayama all inhalations are done through the right nostril and all exhalations through the left.



Technique

1. Sit in any meditative asana e.g. Padasana, Sukhasana etc. Close your eyes.
2. Keep the left nostril closed with your middle and ring finger of the right hand.
3. Slowly inhale without making any sound through the right nostril as long as you can do it comfortably.





4. Then bring your hand down and place it on the knees and retain the breath by firmly pressing the chin against the chest. Simultaneously contract your rectum muscles.
5. This point cannot be reached at the very outset. You will have to increase the period of retaining breath gradually. This is the limit of the sphere of practice of Surya Bhedhana Pranayama.
6. Exhale very slowly, without making any sound through the left nostril by closing the right nostril followed by releasing the rectum muscles (anal lock), chest from the chin lock.
7. Relax and come back to original position. Do this for 3 to 5 times.

Benefits

1. This Pranayama should be performed again and again, as it purifies the brain and destroys the intestinal worms and diseases arising from excess of wind (Vayu).
2. It helps to manage rhinitis and various sorts of neuralgia.
3. The worms that are found in the frontal sinuses are removed.
4. It is good for persons suffering from low blood pressure.

3.4.4 UJJAYI PRANAYAMA

In this practice, both the nostrils are used for inhaling air and the left one for exhaling. The sound represented by the letters 'Aum' is to be produced during the practice, by a partial closure of the glottis. This sound is a peculiarity of this Pranayama and its name is derived from this fact.



Technique

1. Sit in any meditative asana. Close the mouth.
2. Inhale slowly through both the nostrils in a smooth, uniform manner.
3. Retain breath for as long as you can hold comfortably and then exhale slowly through the left nostril by closing the right nostril with your right thumb.
4. Expand the chest when you inhale.
5. During inhalation, a peculiar hissing sound is produced owing to the partial closing of the glottis.
6. The sound produced during inhalation should be of a mild and uniform pitch. It should be continuously practiced.

Benefits

1. Removes heat from the head.
2. The practitioner's voice becomes clear and melodious.
3. Removes phlegm in the throat and all sorts of pulmonary diseases are managed effectively.
4. It is good for asthmatic patients and also for the patients of respiratory disorders.

3.4.5 BHRAMARI PRANAYAMA

The word Bhramari means a black bee. While practicing this Pranayama, the sound produced resembles the buzzing of a black bee. Bhramari Pranayama is effective in instantly calming down the mind. It is one of the best breathing exercises to keep the mind free of agitation, frustration or anxiety and get rid of anger to a great extent.

Technique





1. Sit in the position of Padmasana or any comfortable sitting position.
2. Close your eyes, lips and ears.
3. Inhale deeply and exhale making sound like that of a black bee.
4. In order to assume benefits from this Pranayama, you should close both ears with your thumbs and exhale making sound of the bee.

Benefits

1. The practice of Bhramari delights the mind.
2. Bhramari is beneficial for pregnant women, for preparation for labour.
3. Blood circulation improves in the brain, clears the ears, eyes, nose and throat.

Precautions

Should not be practiced on empty stomach.

3.4.6 SHEETKARI PRANAYAMA

The word SheetKari is made up of 2 words "Sheet" means "Coolness" and "Kari" means "which arise". Sheetkari Pranayama literally means "Hissing Breath". In this breathing technique, we make a sound like a snake (hissing sound) while breathing in from our mouth, that is why it is also known as Hissing breath. Sheetkari Pranayama is very helpful in keeping our mind and body calm.



Technique

1. Sit in Padmasana or any comfortable asana. Place your hands on the knees in Jnana Mudra. Close your eyes.
2. Touch the palate with your tongue.
3. Close both the jaws with your teeth tightly pressed against each other, keeping the lips open.

4. Draw in air through the mouth with the hissing sound Siii—. Retain breath for as long as you can hold, pressing the chest against the sternum (chin lock) and simultaneously pulling the rectum muscle (anal lock).
5. Exhale slowly from both the nostrils, releasing the chin lock and anal lock.

Benefits

1. It quenches thirst and appeases hunger. It cools the body system.
2. It destroys gulma (chronic dyspepsia), pleeha, inflammation of various chronic diseases, fever, indigestion, bilious disorders and phlegm.

When you are caught up in a jungle or any place where you cannot get water, practice this Pranayama to avoid feeling thirsty. You will be relieved of thirst at once.

Precautions: Those who are suffering from cold, cough or tonsilitis should not practice this Pranayama.

3.4.7 SHEETALI PRANAYAMA

As the name indicates, this Pranayama cools the system.

It helps to keep the body's temperature down.



Technique

1. Sit in Padmasana or in any comfortable position. Place your hands on the knees in Gyan Mudra. Close your eyes gently.
2. Open your mouth, bring the tongue outside the mouth and form a cylindrical shape by bending both the extreme sides of the tongue longitudinally and inhale.
3. While inhaling, the air should pass through the tongue.
4. Close your mouth.





5. Retain breath for as long as you can while pressing the chin against the chest (chin lock), simultaneously pulling your rectum muscles (anal lock).
6. Then release chin lock and anal lock and exhale slowly through the nostrils.

Benefits

1. Beneficial in diseases pertaining to throat and spleen etc.
2. Cures indigestion.
3. Helps in controlling thirst and hunger. Lowers blood pressure.
4. Beneficial for diseases caused by imbalance of pitta dosha (heat)
5. Purifies blood.

I. Tick the correct option.

1. Which of the following is a Kriya?
 - i. Kapalbhati
 - ii. Bhastrika
 - iii. Ujjayi
 - iv. Nadishodhana
2. Which Pranayama should be avoided during winters?
 - a. Sheetkari
 - b. Bhramari
 - c. Surya Bhedhana
 - d. Ujjayi

II. Answer the following questions briefly.

1. Differentiate between Surya Bhedhana Pranayama and Anuloma-viloma
2. Briefly explain any two Pranayama techniques.

III. Answer the following questions in 150-200 words.

1. What is significance of Pranayama?

3.5.1 ACTIVE LIFESTYLE AND STRESS MANAGEMENT THROUGH YOGA

Medical science defines stress as a specific response of body to all the nonspecific demands secretions of certain hormones. When a person faces problems in his everyday life which exceed his resources for coping with them, he feels stressed. Stress is a demand on our adaptability to evoke a response. But we must remember



that stress is not just for external environments, it can be generated from within ourselves, from our fears, hopes, expectations and beliefs.

It is an accepted fact across the world that Yoga brings happiness, peace of mind and a positive state of health. However, there is a limited understanding regarding the ways in which yoga achieves these things. Actually, yoga aligns the body, mind and intellect level by proper knowledge of structure and function, through self-realization of inner awareness.

When our resources are overworked, our exhausted body stops functioning smoothly. The signs that indicate this may be physical signs such as high blood pressure, high blood sugar, digestive disorders, back pain, and many others.

The Yogic asanas stretch and tone every muscle and joint of the body, as well as the spine, and skeletal muscles, the organs, as well as nerves, keeping the entire system in radiant health. By releasing physical and mental tension, a person liberates a vast amount of energy. The yogic breathing practice known as Pranayamas, revitalize the body and help to control the mind, leaving the person calm and refreshed. Relaxation helps control anxiety, hypertension and other discomforts of the mind and body.

Yogic concept considers health as a holistic way and sees the person as a whole. The five approaches to manage any healthy life style and emerge victorious are ahara, vihara, achara, vichara and vyavahara.

- Ahara (food and wellness) is about what to eat, when to eat, how to eat, how much to eat and what not to eat. The yogic approach lays emphasis on mithara i.e. $\frac{1}{2}$ filled with food, $\frac{1}{4}$ with water and $\frac{1}{4}$ with air, which includes proper quality of food and also the state of mind which enhances the vitality and longevity of life.
- Vihara (recreation and wellness) comprises of three components - relaxation, recreation and relationships. Where person can express his/her emotion or bring emotion into creativity or in healthy way. There is also requirement of sound sleep.
- Achara (right conduct) is about how to set and follow routines to improve your lifestyle. It includes right habits, right attitude and right behaviour for one self and others. Yama and Niyama play an important role in better management of life.
- Vichara (right thinking) is to be in a conductive frame of mind. Yogic approach helps in controlling the vrittis (thoughts/modifications) of the mind and thereby giving positive directions to the negative thoughts.





- Vyavahara (right behaviour) the Bhagvadgita propounds that actions must be performed with a sense of detachment and duty. Right behaviour towards self and others is also a key to a healthy life style. Here again we must apply the principle of maître, mudita and upeksha respectively towards happy, sad, virtuous and evil person.

3.5.2 GENERAL GUIDELINES FOR YOGA PRACTICE

Yoga practitioners should follow the guiding principles given below while performing yoga practice.

Before the practice

- Saucha means cleanliness - an important prerequisite for yogic practice. It includes cleanliness of surroundings, body and mind.
- Yogic practice should be performed in a calm and quite atmosphere with a relaxed body and mind.
- Yogic practice should be done on empty stomach or light stomach.
- Consume small amount of honey in lukewarm water if you feel weak.
- Bladder and bowels should be empty before starting yogic practices.
- A mattress, yoga mat, durrie or folded blanket should be used for the practice.
- Light and comfortable cotton clothes are preferred to facilitate easy movement of the body.
- Yoga should not be performed in a state of exhaustion, illness, in a hurry or in acute stress conditions.
- In case of chronic disease/pain/cardiac problems, a physician or a yoga therapist should be consulted prior to performing yogic practices.
- Yoga experts should be consulted before doing yogic practices during pregnancy and menstruation.

During the practice

- Practice sessions should start with a prayer or an invocation as it creates a conducive environment to relax the mind.
- Yogic practices shall be performed slowly, in a relaxed manner, with awareness of the body and breath.
- Do not hold the breath unless it is specially mentioned to do so during the practice.



- Breathing should be always through the nostrils unless instructed otherwise.
- Do not hold the body tightly, or jerk the body at any point of time.
- Perform the practices according to one's capacity.
- It takes some time to get good results, so persistence and regular practice is very essential.
- There are contra-indications/ limitations for each yoga practice and such contra-indications should always be kept in mind.
- Yoga session should end with meditation/ deep silence/ Sankalp Shantipatha.

After Practice

- Bath may be taken only after 20-30 minutes of practice.
- Food may be consumed only after 20-30 minutes of practice.

YOGA PROTOCOL FOR STRESS MANAGEMENT (30 Minutes)



S.NO.	YOGA PRACTICES	ROUNDS	DURATIONS
1	PRAYER		1 Minute
2	Yogic Suksma Vyayama (Micro Circulation Practices)		5 Minutes
	Neck Movements:		
	Forward & backward bending	3 Rounds	
	Right & left bending	3 Rounds	
	Right & left twisting	3 Rounds	
	Neck Rotation (clock & anti clockwise)	3 Rounds	
	Shoulder Movements		
	Shoulder stretch	3 Rounds	
	Shoulder rotation (forward & backward)	3 Rounds	
	Trunk movements		
	Trunk twisting (Katishaktivikasaka)	3 Rounds	
	Knee movement	5 Rounds	
	Ankle movement		
	Ankle stretch	5 Rounds	
	Ankle rotation (clock & anti clockwise)	5 Rounds	
3	Yoga Sthula Vyayama: (macro circulation practice)		
	Sarvangapusti	3 Rounds	

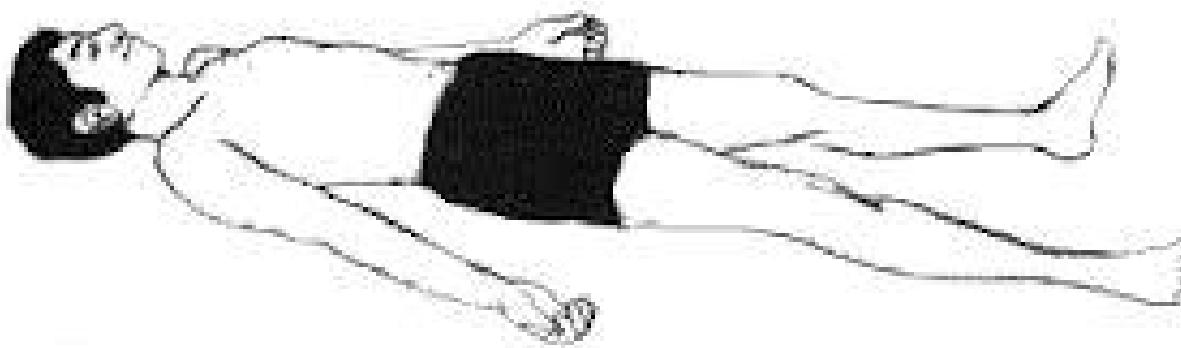




4	Yogasanas		12 Minutes
	Standing posture		
	Tadasana (Palm Tree pose)		
	Urdhva Hastottasana (Raised Arm Pose)		
	Sitting Posture		
	Ushtrasana (camel pose)		
	Sasankasana (Hare Pose)		
	Uttana Mandukasana (stretched up-Frog Pose)		
	Vakrasana (spinal twisting pose)		
	Prone posture		
	Bhujangasana (Cobra pose)		
	Supine posture		
	Pawanmuktasana (wind releasing pose)		
	Sethubandhasana (bridge pose)		
5	Pranayama;		
	Nadi/Shodhana or Anuloma Viloma Pranayama (alternate nostril breathing)	2 Rounds	6 Minutes
	Brahmari Pranayama	5 Rounds	
6	Dhyana		5 Minutes
7	Santi Patha		1 Minutes
	TOTAL TIME		30 Minutes

3.5.3 RELAXATION TECHNIQUE - YOGA NIDRA

The Sanskrit word yoga means union or perfect awareness, and nidra means sleep. Yoga nidra is a state where the body appears to be asleep, but the consciousness is functioning at a deeper level of awareness. Yoga nidra an effective technique for relaxation and helps towards stress-management and wellness.





Techniques

1. Lie down straight on your back in Shavasana (Corpse Pose). Close your eyes and relax. Take a few deep breaths in and out. Remember to take slow and relaxed breaths.
2. Start by gently taking your attention to your right foot. Keep your attention there for a few seconds, while relaxing your foot. Then gently move your attention up to the right knee, right thigh and hip. Become aware of your whole right leg.
3. Gently, repeat this process for the left leg.
4. Take your attention to all parts of the body: stomach, navel region, chest.
5. Take your attention to the right shoulder, right arm, palms, and fingers. Repeat this on the left shoulder, left arm, throat, face, and finally the top of the head.
6. Take a deep breath in and observe the sensations in your body. Relax in this state for a few minutes.
7. Slowly becoming aware of your body and surroundings, turn to your right side and keep lying down for a few more minutes. Rolling over to the right side makes the breath flow through the left nostril which helps cool the body.
8. Taking your own time, you may then slowly sit-up, and whenever you feel comfortable, slowly, and gradually, open your eyes.

Things to remember while performing yoga nidra

- 1) Yoga Nidra, is best done on an empty stomach
- 2) This asana should be practised in a comfortable clutter-free space.
- 3) Some people may feel a little cold after Yoga Nidra, so, it is a good idea to keep a blanket handy.

Contraindications

1. Yoga Nidra should be done at your discretion, especially if you face severe clinical depression or other challenging mental health conditions. The extra introversion is unlikely to help. However, it may help relieve mild conditions.
2. Do not do yoga nidra while driving or operating machinery, as you may fall a sleep.



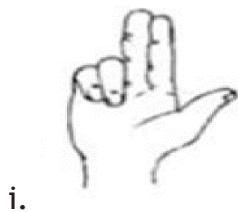


Benefits and limitations

1. Produces deep relaxation.
 2. Reduces stress and anxiety.
 3. Reduces depression.
 4. Reduces pain and dependency on drugs.
 5. Reduces addictions.
 6. Provides relief from insomnia and improves quality of sleep.
 7. Improves clarity of thought and memory.
 8. Improves learning capacity and acquisition of new skills.
-

I. Tick the correct option.

1. Yoga-nidra is performed in
 - i. Shavaasana
 - ii. Simhasana
 - iii. Swastikasana
 - iv. Vajrasana
2. One of the five approaches as per Yoga to manage healthy life style through 'quality of food' is
 - i. Achara
 - ii. Ahara
 - iii. Vichara
 - iv. Vihara
3. The correct positioning of fingers in Anulom-Vilom is

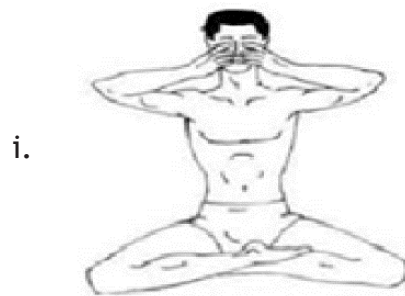


4. Which of the following Pranayam poses is given below?



- i. Anulom-Vilom
- ii. Jal-Neti
- iii. Trataka
- iv. Kapalbhati

5. Which of the following is Bhramari Pranayama?



II. Answer the following questions briefly.

1. Detail the general guidelines for yogic practice for wellness?

III. Answer the following questions in 150-200 words.

- 1. Explain how Yoga can help in active lifestyle and stress management ?
- 2. What is the procedure to do perform yoga-nidra?
- 3. What is the role of yoga in reducing stress?



IV. Complete the table given below.

Asana	Technique	Benefits
Kapalbhati		
Jal-Neti		
Vamana Dhauti		
Anulom-Vilom		
Surya Bhedhana Pranayama		

V. Case Study





The path of yoga is a flight of eight steps. Efficiency in yoga is attained through step by step process. These are also known as eight elements of yoga. They are for the individual to think about and ponder over with a rational mind, because yoga is not about mindlessly accepting externally imposed rules- it is about finding the truth for oneself and connecting with it. On the basis of your knowledge of elements of yoga answer the following questions:-

- a) Which is the first element of yoga?
- b) Which is the last element of yoga?
- c) The last three limbs of Ashtanga Yoga are the essential stages of meditation; name them.
- d) Name the five yamas or code of conduct towards the outside world?
- e) What is the meaning of Pranayama?

VI. Art Integration

MAKING YOUR OWN YouTube/TV SHOW

Would you like to make your own instructional Yoga Show? Well why not do it? It's not very difficult and is a lot of fun.

1. The first step is, of course, the format of the show. You have to set yourself apart from the others. So, decide on your target audience. You could focus on teaching seniors only, or you could combine your classes with hip-hop music.
2. Choose a name for your Show. It should be something memorable, and relevant. Don't copy any other show's name. Make the name of your Show unique.
3. Get all the things you need. A camera for recording the Yoga Asanas, a recorder for voice over giving instructions, suitable music, a mat.
4. Come up with material for the show. Decide upon the Asanas you wish to demonstrate. They should be interesting, and at the same time not so complex that people are unable to follow them.
5. Choose a crew. You will need
 - ◆ Someone to operate the camera(s).
 - ◆ A Host and (or) a co-Host who give the instructions/voice-over for the Asanas.





6. Two or three persons demonstrating the Asanas. They must be adept at what they do to avoid any fiascos.
7. Create a script and proofread it.
8. Select an awesome set. Don't have your show with bare white walls in the background. Create an awesome set that is unique.
9. Plan out segments. Start planning out unique segments for your web show. How many Asanas would you like to include? Would you like to take a break? Or more than one break between the Asanas?
10. Rehearse the asanas, voice-over, music and recording well. Start rehearsing

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Weblinks		
Topic	Weblinks	QR Code
Concept of Yoga by Ministry of AYUSH	https://yoga.ayush.gov.in/	
The Science and Art of Yoga	https://yoga.ayush.gov.in/Publications/gallery/JOURNAL/Yoga%20Vijnana%20Vol.%202.pdf	
History of Yoga	https://yoga.ayush.gov.in/Yoga-History/	

UNIT 4

PHYSICAL EDUCATION AND SPORTS FOR CHILDREN WITH SPECIAL NEEDS



Content

Concept of Disability & Disorder

Types of Disability, its causes & nature (intellectual disability, physical disability)

Disability Etiquettes

Aim & Objective of Adaptive Physical Education

Role of various professionals for children with special needs (Counsellor, Occupational Therapist, Physiotherapist, Physical Education Teacher, Speech Therapist & Special Educator)





Learning Outcomes

In this chapter you will learn to

- Describe the concept of Disability and Disorder.
- Outline types of disability and describe its causes and nature.
- Adhere and respect children with special need by following etiquettes.
- Identify possibilities and scope in adaptive physical education
- Relate various types of professional support for children with special needs along with their roles and responsibilities.

Discussion

Several terms and phrases related to special needs may create some amount of confusion, perhaps misunderstanding. Look at the already know, want to know and ultimately learn (KWL) Chart given below. Complete the first two columns. Fill in the last column after completing your research by reading, or watching relevant videos.

Word	What I Know	What I Want to Know	What I Learned
Differently abled			
Disability			
Hidden disability			
Temporary disability			
Impairment			
Disorder			
Integration			
Adaptation			
Inclusion			

Case Study

The Commonwealth Games in Manchester, England in 2002, marked an extremely important change in the way disabled competitors were treated in athletics tournaments. For the first time, medals won by disabled competitors were counted towards their countries' final totals. Disabled competitors joined the procession of national teams, they lived together in the athletes' village, and their events were staged in the same stadiums at peak times alongside star names.

Read the following transcript of a radio interview with Desmond Green, a former athlete on the changes in the Manchester Commonwealth Games.

Presenter: Do you think these changes are a welcome step forward?

Desmond Green: Much, much more than that. They are a revolution in sport. After yesterday we can't go back, though for certain the traditionalists will complain. No, it's a marvellous turning point. Calling someone a 'disabled athlete' will no longer be considered one of those second best, embarrassing expressions: it will stand for status of a sort that will appeal to the public.

Presenter: Surely, what the public want to see is first past the post, the world's fastest - that sort of thing... **Green:** Ah, that's precisely what traditionalists will say! But it isn't like that. These decisions have turned sport upside down because, from now on, we shall acknowledge what individuals can do. Take Natalie du Toit.





Since losing her leg in a road accident, she's trained relentlessly. Now she's in Manchester representing South Africa as a swimmer. What an achievement against the odds! That's the sort of story readers want. They're tired of muscles and speed and running the same old races in the same old ways.

They want real competitors, people who are doing their best under very trying circumstances, just like them. The traditionalists can't handle that. They fear change and want athletics competitions to be the same as always.

Presenter: So you reckon spectators will like this?

Green: Of course. They've seen it in marathon events. You see, they want more than excellence. To see a magnificent performance by someone in a sporting wheelchair is moving and uplifting. You identify strongly with them, which is emotional. You could say that these changes give us a new version of an old sport, something fresh and exciting to talk about. But the real importance is that it inspires the spectators. How many of us who are burdened by unhappiness and depression will see the Games and ask ourselves why we can't overcome our difficulties and go and do something positive ourselves?

Presenter: I suppose you're also saying that these changes in the ways disabled athletes are treated mark a change in our attitudes towards them.

Green: Absolutely. They're taking a real part. No one can patronise them with second-class events that 'someone let us have because we are cripples', tagged on for the sake of political correctness. No patronising, that's the point. They're there in their own right. You know, 'political correctness' is necessary because it protects people - but it's marvellous when you can throw it out of the window and start again.

Presenter: You feel very strongly about disability, don't you, Desmond?

Green: I do. There are many forms, and you and I could easily find ourselves classified in some way. When we talk about a minority, we forget how many real people there are out there and the important part they play in society. These games will help people to turn disability into normality. I've seen blind people skiing, and we both know about the work done by societies for horse-riding for the disabled. We all want to be accepted as normal, and this will help.

Presenter: Will the Games change disabled people's attitudes too?

Green: Anything that gives them the confidence they deserve is important. They will hear interviews with athletes and they'll say, 'Why can't we do something like that?'

Presenter: I can see why you mistrust traditionalists.





Green: They live in ivory towers, in the past. They talk about the pursuit of excellence and how athletes must be ruthless. They deride the participation of the disabled because they say that athletics is not suitable for them. But no organisation can protect itself from change. If it does, it withers away. These changes are important because they show that athletics is alive and that will gain public support and interest.

Presenter: Some disabled athletes argue that not enough has been done.

Green: There's a long way to go, but what has been done is radical. It'll take some time to digest. Then we can all think what we should add. It's not beyond us to invent other ways of celebrating the excellence of personal achievement.

1. Why is the format of the Manchester Commonwealth Games being referred to as revolutionary?
2. What does the term 'political correctness' mean? What is being referred to as political correctness?
3. Based on your reading of the transcript, and the subsequent changes that have taken place in the sports activities related to athletes with special needs, write a paragraph in about 200 words expressing your views on the issue of the equal participation of able-bodied and disabled athletes.

4.1. Concept of Disability and Disorder

Parents of children with special needs are often confronted with a number of terms for describing the child's challenges, and the challenges are either termed as 'disorders' or 'disabilities'. For example, some people seem to talk about Autism, Dyslexia or ADHD as "disorders," while others refer to them as "disabilities." Sometimes it seems as though the terms are used interchangeably. But do they actually mean the same thing? Let's try to understand the two terms in a broader perspective.

4.1.1. Disorder

The term Disorder refers to the disruption or disturbance caused to the normal functions of a body. Disorder is more of a 'characteristic' classified in medical terms according to clinically significant disturbance in an individual's physical, cognitive and emotional regulation or behaviour. Physical disorders like stomach disorders which cause disturbance in normal functioning, but still are retractable, are a common example to understand the concept of disorder. Other than physical, disorders can be mental or cognitive in nature, for example anxiety disorder. Substance abuse disorder, addiction disorder, attention disorder, eating disorder are few more common examples of disorders. The most important aspect for understanding a disorder is





that the individual experiencing a disorder has the possibility for being treated and being restored to the condition of fitness as they were before. That means disorders have chances of being reversed. Due to the flexible nature disorders, they may not always be evident in every single situation. Equally what may affect one individual may not be as troublesome for another individual in the same situation. Therefore, a disorder is a very flexible and individual term.

Looking at disorders in a little more detail, we can describe disorder as characteristics described as per medical conditions associated with painful symptoms or impairment or significantly increased risk of fatality. This concept adds the following features for disorder:

- **Associated:** Disorder can be associated with Physical or Mental functioning disturbance
- **Kinds:** Different kinds of disorder include mental disorders, attention disorder, eating disorder, anxiety disorder, substance abuse, addiction disorder and so forth.
- **Reversal:** Individuals experiencing disorder can be treated to being as they were before.

In disability sports, participant athletes are those having disorders for a long period of time which have led to functional disability or limitation in doing basic living tasks. This legally termed and classified functional disability is referred as Disability. Further in this chapter, let's try to understand the terms 'Disability' as a legal term used in disability sports perspective for various functional limitations.

4.1.2 Concept of Disability

Disability is an integral part of human life. Almost every one of us has faced temporary or permanent impairment at some point in life that may have led us to experience difficulties in functioning. Also, in addition to needs in common with other children, some children may have needs that are special needs. From early times, humanity has faced the moral and political issue of how best to include and support people with disabilities.

The term Disability is a very vast one and encompasses all kinds of physical impairments, activity limitations, and participation restrictions. Disability is a condition that produces a long-term impairment that affects activities of daily living, such as eating, walking, and maintaining personal hygiene. Around 15% of the global population - over a billion people - lives with some form of disability, of whom 2-4% experience significant difficulties in functioning as a result. This number is expected to double to 2 billion by 2050. Many of these people require assistive technologies such as low-vision devices, wheelchairs or hearing aids.



Disability may be

- congenital, or present from birth,
- occurring during a person's life time,
- invisible disability (not noticeable easily) and
- temporary disability (recovery is possible).
- These conditions, or impairments, may be cognitive, developmental, intellectual, mental, physical, sensory, or a combination of multiple factors.

The **Convention on the Rights of Persons with Disabilities** and its **Optional Protocol** was adopted on 13 December 2006 at the United Nations Headquarters in New York. The Convention follows decades of work by the United Nations to change attitudes and approaches towards persons with disabilities. The Convention is intended as a human rights instrument with an explicit, social development dimension. It adopts a broad categorization of persons with disabilities and reaffirms that **all persons with all types of disabilities must enjoy all human rights and fundamental freedoms**. To give effect to the United Nations Convention on the Rights of Persons with Disabilities an act named the **Rights of Persons with Disabilities Act 2016** (RPWD Act 2016) was passed by Indian Parliament on 27th December 2016.

Do you know

Barriers include communicational, cultural, economic, environmental, institutional, political, social, attitudinal or structural factors which hamper the full and effective participation of persons with disabilities in society. For instance, 'stereotyping' might be an attitudinal barrier, wherein people assume that the quality of life of a person with disability is poor or that they are unhealthy because of their impairments, and so such a person must live a dull life without seeking happiness. Lack of availability of books/ materials in Braille for a visually impaired person can be a communicational barrier. Social barriers are related to the conditions in which people are born, grow, live, learn, work and age - or social determinants of health - that can contribute to decreased functioning among people with disabilities. For instance, persons with disabilities are more likely to be unemployed than others.

Institutional barriers include many laws, policies, strategies or practices that discriminate against people with disabilities. This may not be intentional but there are practices which do not accommodate persons with disabilities denying them equal rights in many circumstances.





4.1 Concept of disability and Disorder

I. Tick the correct option

1. A Disability present at the time of birth is also known as
 - i. invisible disability
 - ii. cognitive disability
 - iii. congenital Disability
 - iv. temporary Disability
2. Which one is Congenital disability?
 - i. Down syndrome
 - ii. Cerebral palsy
 - iii. Polio
 - iv. Both A and B
3. Name the category of disability which can be difficult for others to recognize/ acknowledge.
 - i. Physical Disabilities
 - ii. Hidden Disabilities
 - iii. Cognitive Disabilities
 - iv. Intellectual Disabilities
4. Which is Hidden disability?
 - i. Dyslexia
 - ii. Autism Spectrum Disorder
 - iii. ADHD
 - iv. Down Syndrome

I. Answer the following questions briefly.

1. Write in detail about Disability.
2. How are the terms Disability and Disorder associated with each other?
3. Define Impairment and Disability.

II. Answer the following question in 150–200 words.

1. Discuss the need of sports for children with special needs.

4.2 Definition of Disability

Do you know?

Impairments are problems in body function or alterations in body structure - for example, paralysis or blindness.

Activity limitations are difficulties in executing activities - for example, walking or eating.

Participation restrictions are problems with involvement in any area of life - for example, facing discrimination in employment or transportation

The International Classification of Functioning, Disability, and Health (ICF) lists nine broad domains of functioning which can be affected:

- Learning and applying knowledge
- General tasks and demands
- Communication
- Basic physical mobility, Domestic life, and Self-care (for example, activities of daily living)
- Interpersonal interactions and relationships
- Community, social and civic life, including employment
- Other major life areas

The ICF states that a variety of conceptual models have been proposed to understand and explain disability and functioning, which it seeks to integrate. Major conceptual models of disability have been proposed by ICF.

The medical model views disability as a feature of the person, directly caused by disease, trauma or any other health condition, which requires medical care provided in the form of individual treatment by professionals. Disability, on this model, calls for medical or other treatment or intervention, to 'correct' the problem with the individual.

The social model of disability sees disability as a socially created problem and not at all an attribute of an individual. On the social model, disability demands a political response, since the problem is created by an unaccommodating physical environment brought about by attitudes and other features of the social environment.

Biopsychosocial model is one that synthesizes what is true in the medical and social models, without making the mistake each makes in reducing the whole, complex notion of disability to one of its aspects. ICF is based on this model, an integration





of medical and social. ICF provides, by this synthesis, a coherent view of different perspectives of health: biological, individual and social.

In simple terms, disability is understood as a condition that produces a long-term impairment that affects activities of daily living, such as eating, walking, and maintaining personal hygiene. As discussed already, disability may be

- congenital, or present from birth,
- occurring during a person's life time,
- invisible disability (not noticeable easily) and temporary disability (recovery is possible). These conditions, or impairments, may be cognitive, developmental, intellectual, mental, physical, sensory, or a combination of multiple factors.

As there are many disabilities which are congenital (present during birth) or occur before the individual attains adulthood, the understanding of the concept of Children With Special Needs (CWSN) is essential to help them lead a life with dignity. CWSN are children who have some difficulties which may in some way impede their ability to function adequately in the family, community or school. Because of these difficulties they find it challenging to attain their full potential. The difficulties they experience may be physical, cognitive, linguistic, social, emotional or psychological. They may, therefore, require special and extra inputs to overcome their challenges.

Do you know

3rd December is celebrated as World Disability Day.

Do you know

DISORDER: is about the CHARACTERISTIC or type of impairment. It may be a medical condition that may give rise to a physical or an intellectual disorder.

DISABILITY: refers to FUNCTIONAL inability or limitations to perform certain activities (activity limitation) and interact with the world around them (participation restrictions).

According to Rights for Persons with Disability Act 2016 : Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others.

Do you know

Emotional and Behavioural Disorders (EBD) is a broad category which is used commonly in educational settings, to group a range of more specific perceived difficulties of children and adolescents.

A child exhibiting one or more of the following characteristics to a marked degree for a long duration of time that adversely affects their education:

2. Difficulty to learn that cannot be explained by intellectual, sensory, or health factors.
3. Difficulty to build or maintain satisfactory interpersonal relationships with peers and teachers.
4. Inappropriate types of behaviour or feelings under normal circumstances.
5. A general pervasive mood of unhappiness or depression.
6. A tendency to develop physical symptoms or fears associated with personal or school problems.

Sporting Activities according to Rights for Person with Disability Act 2016

1. The appropriate Government shall take measures to ensure effective participation in sporting activities of the persons with disabilities.
2. The sports authorities shall accord due recognition to the right of persons with disabilities to participate in sports and shall make due provisions for the inclusion of persons with disabilities in their schemes and programmes for the promotion and development of sporting talents.
3. Without prejudice to the provisions contained in sub-sections (1) and (2), the appropriate Government and the sports authorities shall take measures to,—
 - (a) restructure courses and programmes to ensure access, inclusion and participation of persons with disabilities in all sporting activities;
 - (b) redesign and support infrastructure facilities of all sporting activities for persons with disabilities;
 - (c) develop technology to enhance potential, talent, capacity and ability in sporting activities of all persons with disabilities;
 - (d) provide multi-sensory essentials and features in all sporting activities to ensure effective participation of all persons with disabilities;
 - (e) allocate funds for development of state of art sport facilities for training of persons with disabilities;
 - (f) promote and organise disability specific sporting events for persons with disabilities and also facilitate awards to the winners and other participants of such sporting events.

4.2.1 Types of Disability

Prior to 1995, we were familiar with only four types of disabilities; Orthopaedic Handicap, Visual Handicap, Hearing Handicap and Mental Handicap. In 1995, Persons with Disability Act came into force and term handicap was replaced with terms





disability and impairment. This act recognized three more disabilities; Low Vision, Leprosy Cured and Mental Illness. In the year 2016, a new Act was enforced -Right of Persons with Disability Act (RPwD Act). This act recognizes 21 disabilities.

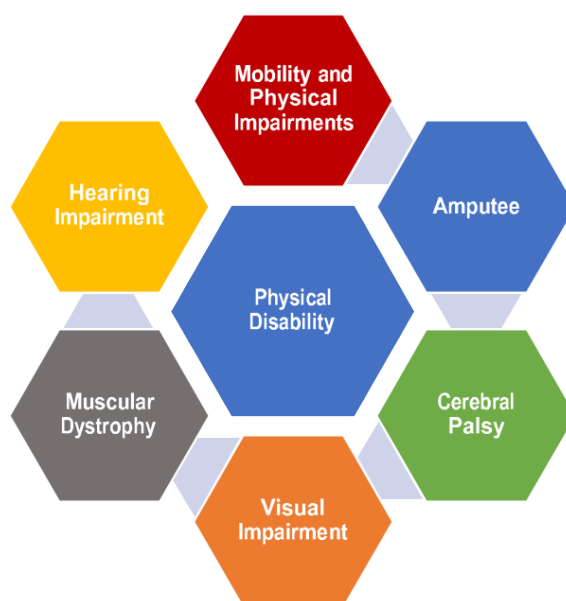
Nature of Disabilities

Students with disabilities face various difficulties in aspects related to personal, academic and sports domains. Broadly these may be described into three major domains. These difficulties may be caused by:

1. Physical Disabilities
2. Intellectual Disabilities
3. Learning Disabilities

4.2.2 Physical Disability

A physical disability is the long-term loss or impairment of part of an individual's body function, resulting in a limitation of physical functioning, mobility, dexterity or stamina. Due to the functional loss, the individual experiences inability to perform normal movements of the body, such as walking and mobility, sitting and standing, use of hands and arms, muscle control, etc. As there are different types of Physical Disabilities, Paralympics Committee divides athletes in groups by the degree of activity limitation related to the impairment and/or specific to the tasks in the sport.

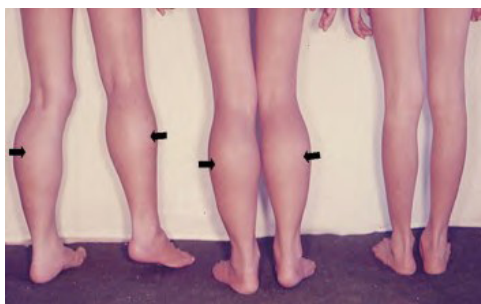


- A. **Mobility and Physical Impairment or Locomotor Disabilities** - A person's inability to execute distinctive activities associated with movement of self and objects resulting from affliction of musculoskeletal or nervous system or both including.

- B. Amputation** - It is the removal of a limb by trauma, medical illness, or surgery. As a surgical measure, it is used to control pain or a disease process in the affected limb, such as malignancy or gangrene. The person whose limb has been amputated is called an amputee.
- C. Cerebral Palsy** - The word cerebral means having to do with the brain. The word palsy means weakness or problems with body movement. Cerebral Palsy (CP) is caused by damage to the parts of the brain that control movement, balance, and posture. Therefore, it refers to a group of non-progressive neurological conditions affecting body movements and muscle coordination, caused by damage to one or more specific areas of the brain, usually occurring before, during or shortly after birth.



- D. Dwarfism** means a medical or genetic condition resulting in an adult height of 4 feet 10 inches (147 centimetres) or less.
- E. Muscular Dystrophy** means a group of hereditary genetic muscle diseases that weaken the muscles that move the human body. Persons with multiple dystrophy have incorrect and missing information in their genes, which prevents them from making the proteins they need for healthy muscles. It is characterised by progressive skeletal muscle weakness, defects in muscle proteins, and the death of muscle cells and tissue.



- F. Visual impairment** Visual impairment is often defined as a best corrected visual acuity of worse than either 20/40 or 20/60. The term blindness is used for complete or nearly complete vision loss. Visual impairment may cause





difficulties with normal daily activities such as driving, reading, socializing, and walking. A significant limitation of visual capability resulting from either disease, trauma or congenital or degenerative condition that cannot be corrected by conventional means such as refractive correction, medication, or surgery.

Blindness means a condition where a person has any of the following conditions, after best correction

- i. total absence of sight; or
- ii. visual acuity less than 3/60 or less than 10/200 (Snellen) in the better eye with best possible correction; or
- iii. limitation of the field of vision subtending an angle of less than 10 degree.

Low-vision means a condition where a person has any of the following conditions, namely:

- i. Visual acuity not exceeding 6/18 or less than 20/60 upto 3/60 or upto 10/200 (Snellen) in the better eye with best possible corrections; or
- ii. limitation of the field of vision subtending an angle of less than 40 degree up to 10 degree.

G. Hearing Impairment - Hearing impairment is the inability of an individual to hear sounds adequately. This may be due to improper development, damage or disease to any part of the hearing mechanism. Hearing is a prerequisite for the development of normal speech and language. A child learns to speak by hearing the speech of others in the family and in his/her surroundings.

- (a) Deaf- means persons having 70 DB hearing loss in speech frequencies in both ears;
- (b) Hard of hearing - means person having 60 DB to 70 DB hearing loss in speech frequencies in both ears;

H. Speech and language disability means a permanent disability arising out of conditions such as laryngectomy or aphasia affecting one or more components of speech and language due to organic or neurological causes.

I. Leprosy cured person means a person who has been cured of leprosy but is suffering from:

- i. loss of sensation in hands or feet as well as loss of sensation and paresis in the eye and eye- lid but with no manifest deformity;

- ii. manifest deformity and paresis but having sufficient mobility in their hands and feet to enable them to engage in normal economic activity;
- iii. extreme physical deformity as well as advanced age which prevents him/her from undertaking any gainful occupation, and the expression “leprosy cured” shall be construed accordingly.

4.2.3 Intellectual Disability

Intellectual disability is a condition of significantly subaverage general intellectual functioning that impacts adaptive behaviours. Different domains of adaptive behaviour may be affected in this condition. These domains determine how well an individual copes with everyday tasks.

- i. **Conceptual-** Language, Reading, Writing, Math, Reasoning, Knowledge, Memory
- ii. **Social-** Empathy, Social judgement, Interpersonal communication skill, Make and retain friendships
- iii. **Practical-** Self-management, Personal care, Job responsibilities, Money management, Recreation, Organizing school and work tasks

On the basis of IQ, children with intellectual disabilities can be classified as mild, moderate, severe and profound. Study the following summary of the common attributes.

CATEGORY	IQ	COMMON ATTRIBUTES
Mild	50-55 to 70-75	Constitutes the largest proportion (about 85%) of persons with intellectual disabilities. They typically develop communication and social skills from ages 0-5 years, have minimal impairment in sensorimotor areas, and often are not distinguishable from children without intellectual disabilities until a later age.
Moderate	35-40 to 50-55	Constitutes about 10% of those with intellectual disabilities. These individuals typically acquire communication skills during early childhood. They benefit from vocational training and, with proper supervision, can attend to personal care. They also benefit from training in social and occupational skills, but struggle to progress beyond a second-grade level in academic tasks. During adolescence, their difficulties in recognizing social norms may interfere with peer relationships.
Severe	20-25 to 35-40	Constitutes 3% to 4% of those with intellectual disabilities. These individuals typically acquire little or no communicative speech during early childhood but during their school-age years may learn to talk and acquire basic self-care skills. They benefit to a limited extent from instruction in basic content such as the alphabet. In adulthood, they may be able to perform simple tasks if closely supervised.
Profound	below 20-25	Constitutes 1% to 2% of those with intellectual disabilities. These individuals exhibit considerable impairments in sensorimotor functioning during early childhood. Optimal development requires highly structured environments with constant individualized support and supervision. Their motor skills, self-care, and communication skills may improve if proper training is provided. They may learn to perform simple tasks under close supervision.

An individual with intellectual disability has limitations in two areas.

Intellectual functioning, which refers to a person’s ability to learn, reason, make decisions, and solve problems.





Adaptive behaviours, or skills necessary for day-to-day life, such as being able to communicate effectively, interact with others, and take care of oneself.

- A. Down Syndrome** - Down Syndrome is a condition which is considered as subtype of intellectual disability. Also known as trisomy 21, it is a genetic disorder caused by the presence of all or part of a third copy of chromosome 21. It is usually associated with physical growth delays, mild to moderate intellectual disability, and characteristic facial features. The average IQ of a young adult with Down syndrome is 50, equivalent to the mental ability of an 8- or 9-year-old child, but this can vary widely. At birth, babies with Down Syndrome usually have certain characteristic signs, including:



Picture Source

- flat facial features,
- small head and ears
- short neck
- bulging tongue
- eyes that slant upward
- atypically shaped ears
- poor muscle tone

People with Down syndrome usually have some degree of developmental disability, but it's often mild to moderate. Mental and social development delays may mean that the child could have:

- impulsive behaviour
- poor judgment
- short attention span
- slow learning capabilities



- B. Autism Spectrum disorder** - Autism spectrum disorder (ASD) is an umbrella term for a group of developmental disorders that are neurological in origin and cause social, communication and behavioural challenges. ASD is mainly characterized by impaired social interaction and communication and the presence of repetitive behaviours or restricted interests. Children with ASD may also have their sensory sensitivity affected i.e, they may be under or over sensitive to certain senses (For example, loud noises, certain fabrics etc).

Symptoms are typically recognized between one and two years of age. Long-term problems may include difficulties in performing daily tasks, creating and keeping relationships, and maintaining a job.

Symptoms of ASD include

Developmental Delay in Initial Years

- i. failure to show interest, not responding to name
- ii. delayed imaginative play
- iii. regression in variety of domains such as communication, social cognitive and self - help skills.

Problems with Social Interaction

- i. largely prefer not to play or interact with others
- ii. display lack of awareness or understanding of other people's thoughts or feelings
- iii. display attention seeking behaviour
- iv. maintain poor eye contact: a child with autism may fail to make eye contact when called by name.
- v. inability to read facial expressions: they often don't know how to recognize emotions from others' facial expressions, or they may not respond with the appropriate facial expressions
- vi. display unusual speech pattern; at least half of children with autism speak in a flat, monotone or they may not recognize the need to control the volume of their voice in different social settings. For example, they may speak loudly in libraries or movie theatres.





Difficulty in Communication

- i. repetitive or rigid language, and restricted interests in conversation. (For example, a child might repeat words or insist on always talking about the same subject.)
 - ii. impairments in pragmatic communication skills, such as difficulty initiating a conversation or failure to consider the interests of the listener to sustain a conversation.
 - iii. language impairment. (Children may develop language skills at an uneven pace acquiring some aspects of communication, while never fully developing others, or may remain completely nonverbal throughout their lives.)
 - iv. Behaviour Problems
 - v. stereotyped behaviours such as rocking, hand flapping, finger flicking, head banging, or repeating phrases or sounds, especially when the child gets stressed, anxious or upset.
 - vi. resistance to change, and preference for routines and rituals that they must follow, like eating certain foods in a specific order, or taking the same path to school every day. The child may have a meltdown if there is any change or disruption to his routine.
 - vii. restricted interests and excessive interest in a thing or topic while ignoring everything else. (For example, children might try to learn everything about a single topic, such as the weather or sports, and talk about it constantly.)
 - viii. oversensitivity to loud sounds, bright lights, strong smells, or being touched.
- C. **Mental illness** means a substantial disorder of thinking, mood, perception, orientation or memory that grossly impairs judgment, behaviour, capacity to recognise reality or ability to meet the ordinary demands of life, but does not include retardation which is a condition of arrested or incomplete development of mind of a person, specially characterised by sub-normality of intelligence.

4.2.4 Learning Disabilities

Learning Disabilities or person with cognitive disabilities has trouble remembering, learning new things, concentrating, or making decisions that affect her/his everyday life. Cognitive disability ranges from mild to severe. A person with a mild cognitive disability people may be able to do her/his everyday activities. Severe levels

of disability can lead to her/his losing the ability to understand the meaning or importance of something and the ability to talk or write, resulting in the inability to live independently. Some of the main categories of functional cognitive disabilities include the following deficits or difficulties.



- A. **Memory-** Memory refers to the ability of a user to recall what they have learned over time. A common model for explaining memory involves the concepts of working (i.e., immediate) memory, short-term memory, and long-term memory. Some individuals with cognitive disabilities have difficulties with one, two, or all three of these memory types.
- B. **Problem Solving-** Some individuals with cognitive disabilities have a difficult time solving problems as they arise. In many instances, their resilience can be low, and the resulting frustration is such that they choose to give up and not persist in solving the problem.
- C. **Attention-** There are many individuals who have difficulty with focusing their attention to the task at hand. Distractions such as any specific sound, colour, design frequently shift the attention.

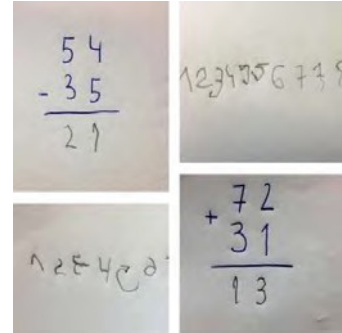
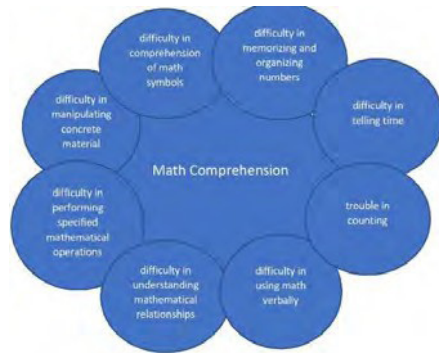
On a positive note, some people with attention deficits are highly creative and very productive in short bursts, with an abundance of energy and enthusiasm. On a less positive note, it can be difficult for people with ADHD to stick to a task for a long period of time.

- D. **Reading, Linguistic, Verbal and Writing Comprehension-** Difficulties related to reading, speaking, understanding and writing are another challenge.





Reading disorder, also known as Dyslexia, is characterized by trouble with reading despite normal intelligence. These difficulties may be mild or severe. Problems may include difficulties in spelling words, reading quickly, writing words, “sounding out” words in the head, pronouncing words when reading aloud and understanding what one reads. In fact, many of the brightest minds of recent generations such as Albert Einstein, Thomas Edison and Henry Ford have suffered from some sort of language or text comprehension difficulty.



4.2.5. Causes of Disabilities and Disorder

Causes of disabilities can be broadly classified into three categories; pre-natal causes, perinatal causes and post-natal causes.

- Pre-natal causes involve events, accidents, illness, infection to mother during pregnancy that affect the baby. Conditions like high blood pressure or diabetes of the mother during pregnancy can cause disability in the child.
- Perinatal causes are the conditions occurring during the delivery of the child that affect the new-born. Delayed labour pain, low birth weight or neonatal infections may cause a disability.
- Post-natal causes include post birth conditions like, illness, infection, poor environment, accidents, psychological factors etc.

The causes may be further sub-divided as

1. **Biological Causes** - Some disabilities are due to the disorder of genes, infectious disease disturbance in glands functioning, illness. Down syndrome, Muscular dystrophy, polio, Developmental disorders are example of various biological issues.
2. **Psychological Causes** - Mental health problems such as depression, bipolar disorder may lead to a spectrum of mental disorders or conditions that influence our emotions, cognitions, and/or behaviours. As a matter of fact, the causes of mental health problems are very difficult to diagnose. They tend to be some of the most misunderstood disabilities.





3. **Delay in Early Screening and Poor management of Disability** - How a child plays, learns, speaks, moves, and behaves all offer important clues about a child's development. A delay in any of these developmental milestones could be a sign of developmental challenges. Early intervention services, like those services that help a child learn to speak, walk, or interact with others, can really make a difference and enhance a child's learning and development. Early screening and identification are critically important steps towards giving young children with disabilities a strong start in life.
4. **Lifestyle** - The mother's lifestyle during pregnancy has a vital effect on the child's growth and development. If a mother smokes during pregnancy, it has an adverse effect on fetal growth and development. Intake of alcohol and indulgence in substance abuse during pregnancy are the most common causes of developmental disabilities, including cognitive disability, learning disabilities, ADHD and behavioural challenges. Once the child is diagnosed with a learning disorder, she/he must be kept meaningfully occupied. The child's eating, sleeping, and exercise habits are very important. In addition to healthy physical habits, children may be frustrated by the challenges presented by their learning disability and, so, should be encouraged to have healthy emotional habits too.
5. **Accidents and War** - One can be the victim of an accident at the workplace, road accident, chemical accident, nuclear accident, or get exposed to radiation etc. This may lead to disability. Dangerous working environment and poor safety precautions are the conditions where one may get disabilities in the long run. Exposure to biological warfare, nuclear radiation, and suffering physical or psychological trauma of a bomb explosion are other reasons of wartime disabilities.
6. **Poor Approach to Healthcare** - Many disabilities can be prevented easily if there is proper access to healthcare facilities during difficult labour and birth. Proper immunization also helps in preventing many disabilities. In remote areas people do not get proper health facilities and it sometimes results in disabilities and disorders in the child.
7. **Lack of Education and Awareness** - Lack of awareness about certain precautions during or post pregnancy may lead to disability. Awareness about nutrition and exercise helps to prevent disabilities or disorders. Due to lack of awareness people start believing in many kind of superstitions and get misguided.
8. **Exposure to Chemicals** - Pesticides and insecticides and other harmful chemicals if mixed in edible items and may give rise to disabilities in people and birth defects in babies. These substances may cause disorder in the functioning of the human body system and may lead to disabilities.





9. **Illness** - Illnesses like cancer, diabetes, heart disease cause a number of long term disabilities such as arthritis, musculoskeletal disorder etc are a significant cause of disability.
-

I. **Tick the correct option**

1. A Disability present at the time of birth is also known as
 - a. invisible disability
 - b. cognitive disability
 - c. congenital disability
 - d. temporary disability
2. Which one is Congenital disability?
 - a. Down syndrome
 - b. Cerebral palsy
 - c. Polio
 - d. Both A and B
3. Name the category of disability which can be difficult for others to recognize/acknowledge.
 - a. Physical Disabilities
 - b. Hidden Disabilities
 - c. Cognitive Disabilities
 - d. Intellectual Disabilities
4. Which is Hidden disability?
 - a. Dyslexia
 - b. Autism Spectrum Disorder
 - c. ADHD
 - d. Down Syndrome
5. In which category would you place a person with intellectual disability if he has a IQlevel between 50-55?
 - a. Mild
 - b. Moderate
 - c. Severe
 - d. Profound



6. A genetic disorder is found in an intellectual disability which is known as?
 - a. Autism
 - b. Cerebral palsy
 - c. Down-syndrome
 - d. None
7. World Disability Day is celebrated on
 - a. 2nd April
 - b. 21st June
 - c. 29th August
 - d. 3rd December
8. What type of disorder is ADHD?
 - a. Mental Disorder
 - b. Emotional Disorder
 - c. Behavioural Disorder
 - d. Genetic Disorder

II. Answer the following questions briefly

1. How are the terms Disability and Disorder associated with each other?
2. Define Impairment and Disability.
3. Write a short note on cognitive disabilities
4. What are the characteristics of cerebral palsy?
5. What are the difficulties faced by person with visual impairment?

III. Answer the following question in 150–200 words

1. Write in detail about Disability.
2. Discuss the need of sports for children with special needs.
3. What are the causes of intellectual disability?

Extension Activity

Nicknamed “Water Baby” for being a natural in water, Yash Singh became the first and youngest Indian to win a medal at the Special Olympics World Summer Games 2015 in Los Angeles. He won a Bronze in the 25-metre backstroke swimming event.

Born on November 14, 2001, Yash Singh embarked on his sporting journey as a





9-year-old boy, participating in school-level competitions. At 11 years, he won a Bronze medal at SO Bharat Delhi Aquatics State Championship in 2013 and thoroughly impressed the judges by his speed. It was a turning point in his life. Being a differently abled athlete did not deter his passion for swimming. He trained and practiced with great zeal and enthusiasm, and followed a strict regime of diet and training, putting in more hours than his peers.

Yash's journey was not an easy path, but he crossed all hurdles to prove to the world that he is no less than his peers and can even be better. Being a visual learner, he takes time in grasping and learning new skills. He always inspires people around him. Being the only differently abled athlete competing in both mainstream and Special Olympics competitions has boosted his confidence and participating at national and international competitions has presented Yash with myriad social and cultural experiences which have enhanced his holistic development.

Sports taught Yash to be independent, never to give up and empowered him to become self-reliant. He could learn and move forward because of the immense support provided by his school, Step by Step School, his coaches and last but not the least his fellow swimmers.

Since 2016, Yash is in Canada. Being on the High School Swim team and Special Olympics and winning at various competitions at different levels gave him confidence and respect

from his fellow team members. He trains regularly at a Swim club and is guided by National and Olympic level coaches including former world record holder Annamay Pierce, Anna Lydall and few other specialists to improve his technique and performance. He has a rigorous training schedule, which includes 1-2 hours of swimming each day, 3-4 days of dryland training, power yoga and playing basketball for overall fitness. He is on a high protein and low carb diet. His regular day begins at 5:30 am with dryland exercises, followed by school, then swimming and ends at around 11 pm.

Yash also played on his school's Cricket and Bowling Team. In 2017, his school cricket team was awarded the Mayor's School Cricket Excellence Award. He also participated in the Track and Field events.

Sports has played an important role in his healthy growth and overall development. He has grown into a well-rounded young man with strong character, self-discipline and high values. He greatly benefitted from the conducive and inclusive environment provided by his school, here and in India. He now wants to explore avenues to learn new skills. His first step in this direction started with being a Volunteer at a Community library and he has not looked back since then. The dedication and sincerity of his work has earned kudos from his colleagues.



individual slowly and clearly. Give them time to respond. While writing, or talking to or about a person with a disability, use “people first” language. Refer to her/him as a person with disability and not as “the disabled” or “the handicapped.” Avoid referring to people by their disability. For example, do not say, “She is an epileptic.” Instead, say, “She has epilepsy.” Do not say “wheelchair-bound” or “confined to a wheelchair.” Most wheelchair users perceive their wheelchair as liberating, not confining. Do say, “She uses a wheelchair.” Do not use negative, demeaning, and outdated terms such as “cripple,” “deaf and dumb,” or “retarded.” Be aware that many people with disabilities do not wish to be referred to euphemistically. So, avoid using terms such as “physically challenged,” or “differently abled.” Also, avoid referring to an individual with a disability as someone who is “suffering from Cerebral Palsy or Parkinson’s.”

Social Etiquette - Make surroundings disabled-friendly and comfortable for people with special needs. Do not make assumptions about what they can or cannot do. The impact of a specific disability can vary widely from person to person, so help only if it appears to be needed. Just because someone has a disability, don’t assume she needs help. If the setting is accessible, people with disabilities can usually get around fine. Adults with disabilities want to be treated as independent people. Offer assistance only if the person appears to need it. A person with a disability will oftentimes communicate when she needs help. And if she does want help, ask how, before you act. Acknowledge and respect the individual’s ability to make decisions and judgments on their own behalf. Never physically or verbally bully them. Never play with their equipment. Ask them before offering any help. Only ask questions about their disability if you know the person. Develop a culture of inclusion in surroundings.

Physical Etiquette - The height difference between a person in a wheelchair and an able-bodied person can create an unspoken feeling of superiority and inferiority. To be safe, sit or stand at eye-level with the person who has a disability when it is appropriate and possible. Finding a table to sit at is a great option because it can eliminate any visible differences, such as a wheelchair.

Sitting in a chair (with or without a table) is also better than kneeling, which may cause the person in a wheelchair to feel like a child. Make eye contact; never avoid someone with a disability. Some people with disabilities depend on their arms for balance. Grabbing them, even if your intention is to assist, could knock them off balance. Avoid patting a person on the head or touching his wheelchair, or cane. People with disabilities consider their equipment part of their personal space.

I. Tick the correct option

1. You have a new classmate who has a disability and has an interpreter as She/He has just joined your school. She/He speaks to you. You will
 - i. communicate with the interpreter
 - ii. stare between the interpreter and your classmate
 - iii. speak directly to your classmate
 - iv. look at neither your classmate nor the interpreter.

II. Answer the following questions briefly

1. What is the role of positive and energetic attitude in dealing with person with Disability?
2. How can you make a person with disability feel comfortable?
3. Disability etiquettes has a big role to give a sense of acceptance to person with disability. Explain how?

III. Answer the following question in 150–200 words

1. Explain what etiquette should one keep in mind while communicating with a person with special needs?

4.4.1. MEANING OF ADAPTED PHYSICAL EDUCATION

Adapted Physical Education is the art and science of developing, implementing, and monitoring a carefully designed Physical Education instructional programme for a learner with a disability, based on a comprehensive assessment, to give the learner the skills necessary for a lifetime of rich leisure, recreation, and sport experiences to enhance physical fitness and wellness.



Adapted Physical Education (APE) generally refers to school-based Programmes for students aged 3-21 years. It is a structured way to make Physical Education and sports accessible to all with modified instruction, resources, space and environment for CWSN as per their ability.

According to Adapted Physical Education National Standards (APENS) Adapted Physical Education is Physical Education which has been adapted or modified, so that it is as appropriate for the person with a disability as it is for a person without a disability. In other words, Adaptive Physical Education (APE) is Physical





Education which has been adapted or modified to make it as appropriate for a person who is differently-abled as it is for a person without disability. It is basically a Physical Education Programme specially designed for differently-abled students so that physical education activities are safe, achievable, enjoyable and, therefore, a successful experience. APE is safe and beneficial even for infants and toddlers who need early intervention services because of developmental delays in physical, cognitive, communication, social and emotional aspects. Moreover, APE is not only for differently-abled infants and students but also for the people of all ages.

Do you know?

Padma Shri & Arjuna Award winner Deepa Malik became India's first female para-athlete to win a medal at the Paralympics. She won silver medal in the shot put at the 2016 Paralympic Games in Rio. Deepa Malik has successfully proved that physical limitations cannot deter a strong mind. She was diagnosed with a spinal tumour in 1999. Although she underwent three surgeries, she was left paralyzed from the waist down. Deepa did not let her physical impairment deter her and started her sports career at the age of 36. This all-rounder is the first paraplegic Indian woman biker, swimmer, car rallyist, entrepreneur and social activist.



Do you know?



13-year-old autistic swimmer Yash Singh is the first Indian to win a medal at Special Olympics World Summer Games 2015 in Los Angeles. He won the bronze in the 25-metre backstroke swimming event.

Extension Activity

Find out about Indian athletes who have won medals at the Paralympics and the Special Olympics.

What disability did they suffer from? In which game did they win the medal?



4.4.2 Aim of Adapted Physical Education

The chief aim of Adapted Physical Education (APE) is to provide every individual an opportunity to participate in Physical Education and sports and to make Physical Education accessible to all as per their need.

4.4.3 Objectives of Adapted Physical Education

The main objectives of Adapted Physical Education include

1. **To build a Programme to meet the needs of CWSN-** Since APE is developed as per the needs of the individual, it is, therefore, more beneficial for the student. For this purpose, the student is assessed on the physical education parameters and an individual education plan is designed. For example, for a student with autism a structured programme with clearly defined timings, day, trainer/coach, start and finish of activity and description of skill with visual cards is helpful for successful partnership.
2. **To build in CWSN the capacity to be functionally active for lifetime -** APE is a planned and structured Programme designed to fit the needs of an individual. For Children With Special Needs, daily life skills become difficult due to restriction in movement, co-ordination challenges, life style issues, behavioural problems and cognitive challenges. APE conditions the brain, muscles and specific movements for different functional tasks, activities or sports/games skills. In this manner, APE stimulates activeness for life time with a regular Programme. e.g., a student with Cerebral Palsy crossing an elementary ladder hurdle where she/he needs physical help to accomplish the task though she/he tries to control her/his reflexes for lifting her/his knee up, judging the space to cross the hurdle and landing her/his foot appropriately to maintain and regain her/his balance to finish the task.
3. **To provide a safe and accessible PE and sports Programme as per the needs of the individual -** During PE Programme, safety must be a primary concern as PE is very dynamic and reactive in movements. For children with special needs, who suffer from different physical and psychological challenges, the safety issues may become magnified. Therefore, during an APE session, environment, instruction and equipment are modified to make PE safe and accessible. Specially designed Physical Education Programme is for those students who are not benefiting from general PE Programme or modified PE Programme. Here, special equipment and support is given to a student to access and enjoy sports and PE sessions. e.g., a guided or supported rope for a person with visual impairment for running or walking, using light equipment for students with





lower action time, using a structured programme or behaviour management for hyper or emotionally challenged students.

4. **To ensure active participation or transition towards the integrated or regular PE Programme (Inclusion)** - APE ensures transition of a student from specially designed PE to integrated PE. APE ensures active and passive participation of a student through a planned programme according to individual needs. This programme can be implemented for maintenance of basic functional fitness, motor movements, skill oriented activities, competitive sports, integration and inclusion. e.g., a person with severe intellectual disability will be involved in physical education activities passively or with physical help to give her/him basic fitness to accomplish daily functional tasks, or a person with mild disability can be given a skill oriented programme where her/his goal is to perform a single sports skill such as dribbling, shooting or floating in water.
5. **Helping to develop self-esteem in CWSN**- APE helps to enhance self-esteem and self-image of CWSN when they are able to access the activity or sports and participate successfully. Ability to perform these tasks and activities easily, and the recognition they derive from this, encourages them to move on to higher goals. Once the goals set are realistic and achievable by working on their motor skills, and students receive recognition, their self-esteem is enhanced and leads to a better self-image. e.g., when a student with cognitive disability achieves success in a physical activity or sport, the resulting recognition leads to enhanced self-image and behavioural change.
6. **To promote regularity and discipline** - Participation in physical activity and sports provides a feeling of wellbeing which promotes regularity and discipline. It encourages the student to continue the activity/sport and adopt a healthy lifestyle which helps overcome the challenges and achieve greater success. e.g., a child with Attention Deficit Hyperactive Disorder (ADHD) may benefit even in cognitive fields with regular participation in sports as not only is her/his energy channelized gainfully but the increase in physical activity is also therapeutic.
7. **To promote sportsmanship** - The Collins dictionary defines sportsmanship as behaviour and attitudes that show respect for the rules of a game and for the other players. Sports include an element of fun and also discipline, where you try to achieve a target whether individually or as a team. When she/he learns and participates successfully in a particular sport, follows the simple rules such as regularity, waiting for her/his turn, listening to and implementing instructions, appreciating the efforts of others, accepting defeat, celebrating victory, feeling of oneness with the team, respecting authority and maintaining decorum on the field modifies her/his behaviour on as well as off the field.



I. Tick the correct options

1. The most important area catered to by Adapted Physical Education is
 - i. Physical health
 - ii. Mental health
 - iii. Social health
 - iv. Emotional health
2. Exclusion from physical activity adds to lifestyle related challenges. The most important of these is
 - i. hyperactivity
 - ii. obesity
 - iii. diabetes
 - iv. postural problems

II. Answer the following questions.

1. What is Adaptive Physical Education?
2. How does Adaptive Physical Education provide CWSN the capacity to be functionally active?
3. Why are safety issues important for CWSN during Physical Education?
4. How can safety standards be met for CWSN?
5. How does Adaptive Physical Education build self-esteem in CWSN?

III. Answer the following questions in 150-200 words.

1. Write a detailed note on the concept of Adaptive Physical Education.
2. What are the chief objectives of Adaptive Physical Education?

4.5.1. ROLE OF VARIOUS PROFESSIONALS FOR CWSN

Keeping in view the fact that Children with Special Needs form one of the largest groups that are still outside the fold of the general education system, Inclusive Education provides them with an opportunity to enter formal education. This makes it necessary for the school to employ various professionals such as school counsellor, occupational therapist, physiotherapist, etc., for CWSN. These professionals help and support children in achieving their full potential physically as well as academically, improve their motor skills, enhance their communication skills and in promote their mental as well as physical health.





These professionals include

1. **School Counsellor** -The school counsellor is the specialist who works with students with special needs in schools and provides a comprehensive Programme that helps CWSN with their academic goals, their social, personal and career development. School Counsellors involve parents, teachers, other school personnel, and members of the community in assisting students' development into effective members of the community. They work with the various members of the school community to create a positive school climate in which children can learn. It is their duty to assure a coordinated team effort to address the needs of all students and ensure student access to school and community resources.

More specifically, School Counsellors use individual and small-group counselling to help students develop aptitudes such as:

- skills in communicating, cooperating, and resolving conflict
- the ability to engage in behaviours that foster good physical and mental health and to avoid behaviours that detract from good physical and mental health
- skills in planning and making decisions, resulting in higher self-efficacy and a sense of personal responsibility
- an awareness of resources about educational and vocational opportunities and ways to access those resources
- positive attitudes towards one's self, as both a student and a potential worker
- an awareness of and appreciation for both genders and the contributions of cultural diversity in society
- a comprehensive plan for school and work experiences through high school and beyond

2. **Physiotherapist** - A physiotherapist is probably the best known of the therapists who works with CWSN. They use exercises to help their patients gain and keep the best possible use of their bodies. They also try to improve breathing, to prevent the development of deformities and to slow down the deterioration caused by some progressive diseases. The aim of a physiotherapist is to help the children with special needs to their full potential through providing physical intervention, advice and support. A physiotherapist evaluates bodily movement of CWSN with particular attention to physical mobility, balance, posture, fatigue and pain.



- The role of a physiotherapist includes
- assessment of the mechanics of the body
- improvement the mobility in terms of joint movement, gross motor
- movement and fine motor movement
- management of children and young persons with movement disorders
- and disability.
- maintenance and conditioning of bones, joints and muscles to prevent degeneration
- rehabilitation through different therapies including massage manipulation, exercise and movement, electrotherapy, cryotherapy and hydro therapy

3. **Occupational Therapist** - An occupational therapist trains CWSN in performing assisted daily-life skills and self-care skills and activities related to fine motor skills and hand-eye coordination. An occupational therapist also helps children in participating and interacting with others in play.

The role of an Occupational Therapist includes

- training for activities of daily living skills like toilet training, eating, dressing, bathing and grooming
- training for fine motor skills like buttoning shirts, tying shoelaces, handwriting, movement of fingers.
- helping children in writing and other classroom activities like grasping and releasing toys and other objects
- sensory intervention and sensory integration to help the child in coping with challenges caused by her/his sensory disorder e.g., using different techniques to minimise self-harm actions, sensory diet to fulfil her/his visual and vestibular needs
- improve skills such as hitting a ball or copying from black board.

4. **Physical Education Teacher** - The Physical Education teachers need to determine the abilities of students with special needs. They also need to determine measures to support their participation in sports, games and fitness activities through general, modified and specially designed PE Programme.

The role of a physical education teacher is

- improving general movement, movement skills and movement patterns
- improving hand-eye coordination, flexibility, muscular strength, endurance





- developing different sports-specific skills such as in basketball, soccer, swimming etc.
- improving social skills such as listening, understanding, implementing, playing in small to large groups, taking responsibilities, leadership etc.
- providing psychological support by channelizing energy to reduce anxiety, hyperactivity, tension and depression, developing self-esteem, reducing feelings of isolation

5. **Speech Therapist** - A speech therapist in school provides treatment, support and care for students with special needs who have difficulties in communication. Speech therapists help students with special needs to gain ability to communicate through speech and language. They help and provide training for students who face difficulty in producing sounds or syllables or saying words incorrectly. They also help such students who have fluency disorders like stoppages, repetitions and prolonging sounds in words. They modify the ways of making two- way communication with different tools and strategies.

6- **Special Educator** - A special educator plays a critical role in weaving all together all the stakeholders in school and at home. The Special Educator is responsible for assessing the level of the child, observing her/his performance or behaviour to bring improvement in different subject areas of special needs education. The role of a special educator includes

- assessment of the child's abilities
- curriculum development as per abilities and suitability
- setting individual education plan (IEP)
- setting weekly, monthly, annual goals
- parent conferences or meetings
- pre- and post-performance observation
- reporting
- integration
- inclusion
- transition





I. Tick the correct option

1. The professional who works along with CWSN, parents, teachers, other school personnel, and members of the community in helping them become effective members of the community is
 - i. the Counsellor
 - ii. the Physiotherapist
 - iii. Occupational Therapist
 - iv. Physical Education Teacher

II. Answer the following questions.

1. What is the role of the School Counsellor in inclusive education?
2. Discuss the role of physiotherapist in integrated education.
3. What is the role of Educational Counsellor in inclusive education?
4. Discuss the role of Speech Therapist in inclusive education.

III. Answer the following questions in 150-200 words.

1. Describe the role of Special Educator in inclusive education.
2. In what ways does the Physical Education Teacher help CWSN get integrated in mainstream schooling?

IV. Complete the following diagram listing the differences between Disorder and Disability.

	Disorder	Disability
Definition		
Common Types		

V. Case Study

1. Physical Education and Sports for CWSN





Children with special needs face different challenges in undertaking certain activities. So, in addition to the regular programmes of physical education the school must provide APE programmes for children. While introducing this chapter to the students, the Physical Education teacher explains the different types of disabilities and the objectives of APE.

On the basis of this chapter answer the following questions.

- a. List down any four types of physical disabilities.
- b. What is Down syndrome?
- c. What is APE?
- d. List any four aims of APE.

VI. Art Inclusion

Working in groups, design a booklet for your school library on Disability Etiquette.

1. Think of the etiquettes you feel need to be included.
2. Draw Graphics to accompany the etiquettes.
3. Laminate the pages and get your book spiral-bound.

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Suggested Reading

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Weblinks

Topic	Weblinks	QR Code
People with Disability Act 2016	https://legislative.gov.in/sites/default/files/A2016-49_1.pdf	





Paralympics classification	https://www.paralympic.org/classification	
Intellectual Disability as per Special Olympics	https://www.specialolympics.org/about/intellectual-disabilities/what-is-intellectual-disability	
How to speak with people with intellectual disabilities	https://www.specialolympics.org/about/intellectual-disabilities/how-to-speak	



UNIT 5

PHYSICAL FITNESS, HEALTH, AND WELLNESS



Content

Meaning & importance of Wellness, Health and Physical Fitness.

Components/Dimensions of Wellness, Health and Physical Fitness

Traditional Sports and Regional Games for promoting wellness.

Leadership through physical activity and Sports

Introduction of First Aid - PRICE





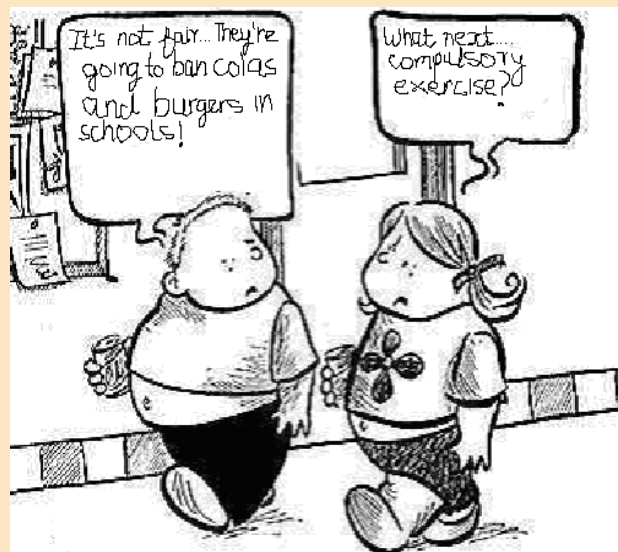
Learning Outcomes

After completing the Unit, students will be able to:

- explain wellness and its importance and define the components of wellness.
- classify physical fitness and recognize its importance in life.
- distinguish between skill-related and health-related components of physical fitness.
- illustrate traditional sports and regional games for promoting wellness.
- relate leadership through physical activity and sports
- illustrate the different steps used in first aid - PRICE

Discussion

Look at the cartoon given below. As a result of a sedentary lifestyle and unhealthy eating habits, obesity among children is on the rise. Using information from the cartoon given below and your ideas, deliver a speech in your class on the importance of healthy eating and regular exercise.



Cases of diabetes in India have seen an increase in the last one decade. In fact, incidence of diabetes is the second highest in India, only next to China. The reasons mentioned by the doctors and the experts are changes in lifestyle and eating habits. The magnitude of the problem is so huge and growing so rapidly that the government is revisiting health promotion strategies for increasing awareness. Physical activities, healthy diet and a change in lifestyle have been highly recommended to overcome the new health crisis.

5.1.1 MEANING AND IMPORTANCE OF WELLNESS

WHO defines health as “a state of physical, mental, and social well-being, not merely the absence of disease.” While the term Health focuses on an individual’s illness status and her/his relationship to that status, wellness transcends the absence of disease. It is much more than merely physical health, exercise or nutrition. In fact, wellness is the full integration of states of physical, mental, and spiritual well-being. Wellness is about living a life full of personal responsibility and, therefore, taking proactive steps for one’s entire well-being. This means that a person living a life of wellness controls risk factors that can harm her/him. Risk factors are different types of actions or conditions that increase a





person's chances for illness or injury. e.g., smoking is a risk factor as there is a risk for developing lung cancer. Alcohol is a risk factor for liver damage. So, an individual takes pro-active steps to remove such health risks from her/his life.

Maintaining an optimal level of wellness is crucial to living a higher quality life. Wellness matters because everything we do, and every emotion we feel, relates to our well-being. In turn, our well-being directly affects our actions and emotions. It's an ongoing cycle. Therefore, it is important for everyone to achieve optimal wellness in order to reduce stress and the risk of illness and to ensure positive interactions.

Thus, wellness may be defined as "the optimal state of health of individuals and groups. There are two focal concerns: the realization of the fullest potential of an individual physically, psychologically, socially, spiritually, and economically, and the fulfilment of one's role expectations in the family, community, place of worship, workplace, and other settings." - WHO Health Promotion Glossary Update 2006.

Other Definitions of wellness

Wellness is a continuous and thoughtful process to stay healthy and achieve total wellbeing. It is a positive and ideal state of an individual which is reflected in an individual's day-to-day work, contribution to society, optimal functioning and possessing a healthy quality of life.

The integration of many different components (physical, emotional/mental, intellectual, social, and spiritual) that expand one's potential to live (quality of life) and work effectively and to make a significant contribution to society. Wellness reflects how one feels (a sense of well-being) about life, as well as one's ability to function effectively. Wellness, as opposed to illness (a negative), is sometimes described as the positive component of good health.

- Charles B. Corbin, Gregory J Welk, William R Corbin, Karen A Welk

Wellness is an active process through which people become aware of, and make choices toward, a more successful existence. - National Wellness Institute

Wellness requires continuous and thoughtful efforts to remain healthy and to reach the highest level of wellbeing. Overall physical wellness is achieved through the balance of physical activity, nutrition, and mental well-being to keep your body in top condition. Health related lifestyle habits lead to longevity, improve quality of life, and help achieve total wellbeing.

Understand the importance of wellness:

- Wellness Programme should be developed with an aim to providing health-related lifestyle education with required support and resources to achieve wellness.



- Wellness makes the individual responsible for taking good decisions and adopting good practices and preventative measures for achieving optimum level of physical, emotional and social functioning.
- Wellness Programmes enable an individual to understand health issues like injuries, chronic diseases, cancer, cardiovascular disease, STDs, obesity, nutrition, diabetes, and other lifestyle related diseases. Thus, they enhance longevity and improve the quality of life.
- It promotes behaviours which help maintain good health like quitting smoking, giving up alcohol abuse etc. and reducing social evils like violence, abuse, child labour, gender inequality, caste system etc., thereby, leading to adoption of positive values that result in an individual becoming a good citizen of the country.
- It enables an individual to maintain a balance between work, personal life and health that results in efficient and consistent output and improves general health, and fitness through adopting regular physical activities.
- It also helps to develop healthy social environment where people share and solve personal and social problems, thus making the individual socially accessible and culturally sensitive.
- Wellness components like physical, emotional, mental, social, environmental, occupational, and spiritual are highly inter-connected and can help to make the environment disease and pollution free.

5.1.2 MEANING AND IMPORTANCE OF HEALTH

As we previously mentioned that health is not merely absence of any disease but it is a state of complete physical, mental and social wellbeing. In today's lifestyle, where people are continuously working in a hectic environment and they have little time for any physical activity, the health of people is compromised. On the one hand, lack of time for exercise and, on the other hand, eating habits of people make things worse. Everyone is looking for an easy and fast way to get their food, which makes fast foods like burgers and pizzas, a viable choice. However, this not only makes people unhealthy, but also makes them vulnerable to many diseases. The food we eat not only affects us physically but it also puts pressure on us mentally and socially. Suppose you eat pizza for dinner daily, it will affect your stomach and you may feel bloated, which in turn affects you mentally as it can lead to gastronomical problems; or, suppose you are not feeling physically well, it will affect you mentally as well as socially, as you will be in a position of discomfort and will not feel like socializing with or meeting people. We need to understand that, we should exercise regularly and incorporate healthy food in our diet, so we can be healthy not only physically, but mentally and socially as well.





5.1.3 DEFINITIONS OF HEALTH

“Health” is one of those terms which most people find it difficult to define although they are confident of its meaning. Therefore, many definitions of health have been offered from time to time, including the following:

- a. “the condition of being sound in body, mind or spirit, especially freedom from physical disease or pain.” (Webster)
- b. “soundness of body or mind; that condition in which its functions are duly and efficiently discharged.” (Oxford New English Dictionary).
- c. “a condition or quality of the human organism expressing the adequate functioning of the organism in given conditions, genetic and environmental.”
- d. “a modus vivendi enabling imperfect men to achieve a rewarding and not too painful existence while they cope with an imperfect world.”
- e. “a state of relative equilibrium of body form and function which results from its successful dynamic adjustment to forces tending to disturb it. It is not passive interplay between body substance and forces impinging upon it but an active response of body forces working toward readjustment.” (Perkins).

WHO definition

The widely accepted definition of health is that given by the World Health Organization (1948) in the preamble to its constitution, which is as follows:

“Health is a state of complete physical, mental and social wellbeing and not merely an absence of disease or infirmity.”

In recent years, this statement has been amplified to include “the ability to lead a socially and economically productive life”.

5.1.4 MEANING AND IMPORTANCE OF PHYSICAL FITNESS

Before we begin, it is essential to understand the meaning of the terms - Exercise, physical activity and physical fitness. We often use these terms interchangeably, which is not the correct usage. Exercise refers to planned, structured and repetitive bodily movements aimed at improving one or more components of physical fitness. e.g., swimming as an exercise aims at improving cardiovascular endurance. Physical activity, on the other hand, is any bodily movement which is not specifically designed for physical fitness but results in significantly increasing resting energy expenditure. e.g., walking will increase the resting energy expenditure but will not contribute to any fitness component. Physical Fitness is a state of health and well-being and the ability to perform aspects of sports, occupations, and daily activities.



5.1.5 Definitions of Physical Fitness

Fitness is the ability of an individual to lead a full and balanced life. It includes physical, mental, emotional, social and spiritual factors and capacity for their wholesome expression.
Charles A. Bucher (1958)

Physical fitness is the ability to carry out daily tasks with vigour and alertness, without undue fatigue and with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies.
H Harrison Clarke (1976)

Physical fitness is the ability to perform moderate to vigorous levels of physical activity without undue fatigue and the capability of maintaining such ability throughout life.
(American College of Sports Medicine)

Individuals are physically fit when they can meet both the ordinary and the unusual demands of daily life safely and effectively without being overly fatigued and still have energy left for leisure and recreational activities.

- Wener W.K. Hoeger, Sharon A. Hoeger (2014)

Physical fitness is associated with a person's ability to work effectively, enjoy leisure time, be healthy, resist hypokinetic diseases or conditions, and meet emergency situations.

- Charles B. Corbin, Gregory J Welk, William R Corbin, Karen A Welk, (2015)

As per above definitions an individual who is physically fit should be able to perform daily tasks efficiently and effectively, without undue fatigue, and, along with that, she/he should also successfully complete the demands of recreational activities and emergent situations.

Everyone's physical fitness differs from the other's depending upon their profession or day to day activities. A doctor's activity is to check patients within the room, while a farmer works hard in the field. Similarly, a sportsperson performs skilfully on the field or court. But as per the definition of physical fitness each of these individuals must successfully perform their day-to-day tasks without undue fatigue and have enough energy for leisure activities like going for a walk, playing table tennis or football etc. whatever, she/he wishes to do. In addition, she/he should be able to meet the situation if there is an emergency at work. e.g., the doctor may be called to see a patient in an emergency and may need to travel some distance to see the patient, or the farmer may have to rush to his farm to save his paddy crop from a natural calamity, when after a day at work, he is participating in some recreational physical activity.





Exercise helps to promote health, to maintain or improve physical appearance and to improve the overall quality of life. Physically active people live life with less health problems and enjoy a better quality of life than people who are physically inactive. Regular physical activity has lots of permanent benefits.

5.1.6 Benefits of Physical Activity

1. **Physical and physiological importance-** Regular exercise improves posture, thus preventing back pain, neck pain etc. and improving physical appearance. Exercise helps to maintain the balance between lean body mass and fat and helps maintain body weight. A physically active lifestyle speeds up the recovery process after injury, disease, or intensive work out. Due to continuous physical activity, flexibility of joints increases, reducing chances of developing arthritic pain and helping to relax muscles. It helps to maintain healthy bones and to maintain bone mass, which lowers the risk of osteoporosis. It also upgrades athletic performance and keeps energy levels high. Due to regular physical activity, an individual's resting metabolic rate become high and her/his body develops such immunity which help to lower incidence of disease. As a result, the individual feels energetic, and that helps in job productivity, enjoyment of leisure time activities and the ability to face emergencies.
2. **Mental and psychological importance-** Regular physical exercise increases the function of brain, enhances memory, and develops creative thinking. Physical fitness enhances self-image, increases morale, self-confidence, and self-esteem, and reduces tension, stress and anxiety. Psychological well-being helps an individual cope better with stress and anxiety, thereby improving her/his mental health.
3. **Social importance-** Improved emotional health and self-esteem improves social relations. Increased self-confidence prompts an individual to reach out to others. Participation in physical activities and sports promotes leadership qualities and strengthens bonds of friendship. Also, participating in sports activities provides opportunity to meet new people who share a common interest. Meeting others may be the first step towards establishing new friendships and developing a support network.
4. **Improved health -** Continuous physical activity increases longevity and slows down the process of aging. It also decreases the mortality rate from chronic diseases. It enhances the quality of life, enabling the individual to live longer, happier, and healthier. Physical activity improves sleep quality and increases sleep duration. Individuals who exercise regularly are less likely to suffer from troublesome sleep disorders, such as sleep apnea and restless leg syndrome. Regular physical activity reduces risk of heart disease, type 2 diabetes, high blood pressure, adverse blood lipid profile, metabolic syndrome, colon and



breast cancers etc. It keeps the blood thin which helps to decrease chances of heart disease and stroke and to maintain level of blood lipid.

5. **Improved financial condition-** Regular physical activity makes an individual healthier and fitter and helps develop good habits. People who adopt an active lifestyle have less chances of falling ill, and less chance of disease means bigger savings in terms of money and time.

I. **Tick the correct option.**

1. Physical activity can help with
 - i. increased stress levels
 - ii. getting sleep apnea
 - iii. causing restless leg syndrome
 - iv. helping your social life
2. "State of complete physical, mental and social wellbeing and not merely an absence of disease or infirmity" is a definition of:
 - i. Wellness
 - ii. Health
 - iii. Fitness
 - iv. Health lifestyle

II. **Answer the following questions briefly.**

1. Define Health.
2. Write a short note on Wellness.
3. What do you mean by Physical Fitness?
4. How does physical fitness improve your financial health?

III. **Answer the following questions in 150-200 words.**

1. What do you mean by Physical Fitness? Write down importance of Physical Fitness for maintaining health lifestyle.
2. What is wellness? What is importance of wellness?

5.2.1 Components of Wellness

There are a lot of health benefits of physical fitness. Optimum fitness is required to prevent injuries, to maintain a stable posture etc. However, physical fitness cannot be achieved without regular physical activity. Physical fitness is an important dimension of the Wellness Programme.





Most people think that physical fitness alone is sufficient to lower the risk of health-related diseases but it is not true. e.g., consider an individual who regularly does vigorous physical training in which she/he does aerobic exercises thrice a week, does weight training and stretching and maintains a good ratio of fat percentage of the body, but at the same time she/he eats junk food regularly, smokes and drinks alcohol. By doing so, she/he is increasing her/his chances of suffering from cardiovascular diseases and facing other health related issues.

Wellness includes factors like spirituality, healthy diet, regular physical activity, personal safety, avoiding drug abuse, preserving environment, prevention of disease, stress management etc. In fact, there are seven components of wellness namely physical, emotional, mental, social, environmental, occupational, and spiritual which are interlinked with each other.



1. **Physical Wellness-** Physical wellness is an individual's ability to meet the demands of day-to-day work and being able to take care of her/his health. Overall physical wellness encourages the balance of physical activity, nutrition and mental well-being to keep the body in top condition. Obtaining an optimal level of physical wellness allows the individual to nurture personal responsibility for her/his own health. As the individual becomes conscious of her/his physical health, she/he is able to identify elements she/he is successful in, as well as elements she/he would like to improve. Physical Wellness includes regular vigorous activities, balanced diet, proper rest, avoiding intake of tobacco or alcohol, living in a healthy environment, following safety precautions etc. A physically fit individual must have optimum muscular endurance, muscular strength, cardiovascular endurance, flexibility and a fit body composition.



2. **Emotional Wellness** - Emotional wellness inspires self-care, relaxation, stress reduction and the development of inner strength. It is an individual's ability to understand and balance her/his emotions, accept her/his own weaknesses, and respect another's strength. It is important to be attentive to one's positive and negative feelings and be able to understand how to handle these emotions. It allows the individual to accept her/his feelings. Once the individual accepts her/his feelings, she/he begins to understand why she/he is feeling that way, and can decide how she/he would like to act in response to those feelings. Emotional wellness also includes the ability to learn and grow from experiences. It is important in today's life that an individual should be able to cope with stress, adjust to one's environment, enjoy her/his life. Trust, self-esteem, self-confidence, optimism are key words for emotional wellbeing.
3. **Mental Wellness** - Mental wellness, also known as intellectual wellness, is an individual's ability to learn, evaluate, accept new ideas, develop creative thinking, have a good sense of humour, and develop a lifelong learning process. Intellectual wellness encourages the individual to engage in creative and mentally-stimulating activities that expand her/his knowledge and skills while allowing her/him to share them with others. Intellectual wellness can be developed through academics, cultural involvement, community involvement and personal hobbies. Intellectual wellness encourages learning and enables the individual to explore new ideas and understandings. It also stimulates curiosity, thereby developing a desire to try new things. An individual with intellectual wellbeing is open-minded and clear, enthusiastic to gather knowledge, accepting of ideas put forth by others.
4. **Social Wellness** - It is an individual's ability to positively interact with the people of different cultures, ages, gender, religion etc. without building stereotypes. Social wellness refers to the relationships an individual may have





and how she/he interacts with others. Her/His relationships can offer support during difficult times. Social wellness involves building healthy, nurturing and supportive relationships. Conscious actions are important in learning how to balance one's social life with one's academic and professional lives. Surrounding oneself with a positive social network increases one's self-esteem. Social wellness enables an individual to establish communication and trust and to manage conflict. Having good social wellness is critical to building emotional resilience.

5. **Environmental Wellness** - Environmental wellness refers to respecting the environment and natural resources. Environmental wellness inspires the individual to live a lifestyle that is respectful of one's surroundings, and prompts the individual to take action to protect it. It promotes respect for all nature and all species living in it. It encourages the individual to adopt habits that promote a healthy environment resulting in a more balanced lifestyle. It helps develop habits like producing and eating organic food, minimizing the use of petroleum products, and reducing air, water, noise and land pollution or food contamination. We are answerable to future generations regarding conservation of natural resources. We should recycle the products which we use and reduce waste and pollution.
6. **Occupational Wellness** - Occupational wellness is the ability to achieve a balance between work and leisure time, addressing workplace stress and building relationships with co-workers. It focuses on the individual's search for a calling and involves exploring various career options and finding where one fits. Occupational wellness deals with satisfaction from job and career of an individual. It is not about holding a high post in a company or drawing a large salary etc. e.g., Individual 'A' may have a good salary in a reputed company, but she/he may not be able to execute the plans or policies of the company effectively. Thus she/he may be stressed. Whereas Individual 'B', drawing a lesser salary and occupying a lower post than A may be satisfied with her/his life. An individual picking up a job should consider internal and external rewards.
7. **Spiritual Wellness** - Generally, people think that spiritual wellness is linked with religion, but the core of spiritual wellness is to find the meaning and direction of life. Spiritual wellness allows an individual to be in tune with her/his spiritual self and to appreciate her/his life experiences for what they are. It lets one find meaning in life events and define one's individual purpose. By finding meaning in her/his life experiences, the individual will be able to develop a harmony between her/his inner self and the outside world. An individual who is spiritually sound has beliefs, principles and values which guide and strengthen her/him in life. By following the path of spirituality an individual



gets faith, love, peace, joy, closeness with others, altruism, compassion and forgiveness.

Thus, we can see that all the components of wellness are linked with each other. Wellness is holistic, because rather than focusing on symptoms, it is important to integrate body, mind, and spirit as one whole. Wellness also considers the self as the only true healer as one's wellness is one's own responsibility. Health professionals can only help facilitate the healing process. It is the individual's body, mind, and spirit that do all the healing. Therefore, it is important to think positive thoughts as negative thinking strips one of power and control. Wellness is outcome-oriented. As soon as one is able to identify a problem, one's energy must be put into the solutions.

5.2.2 Components of health

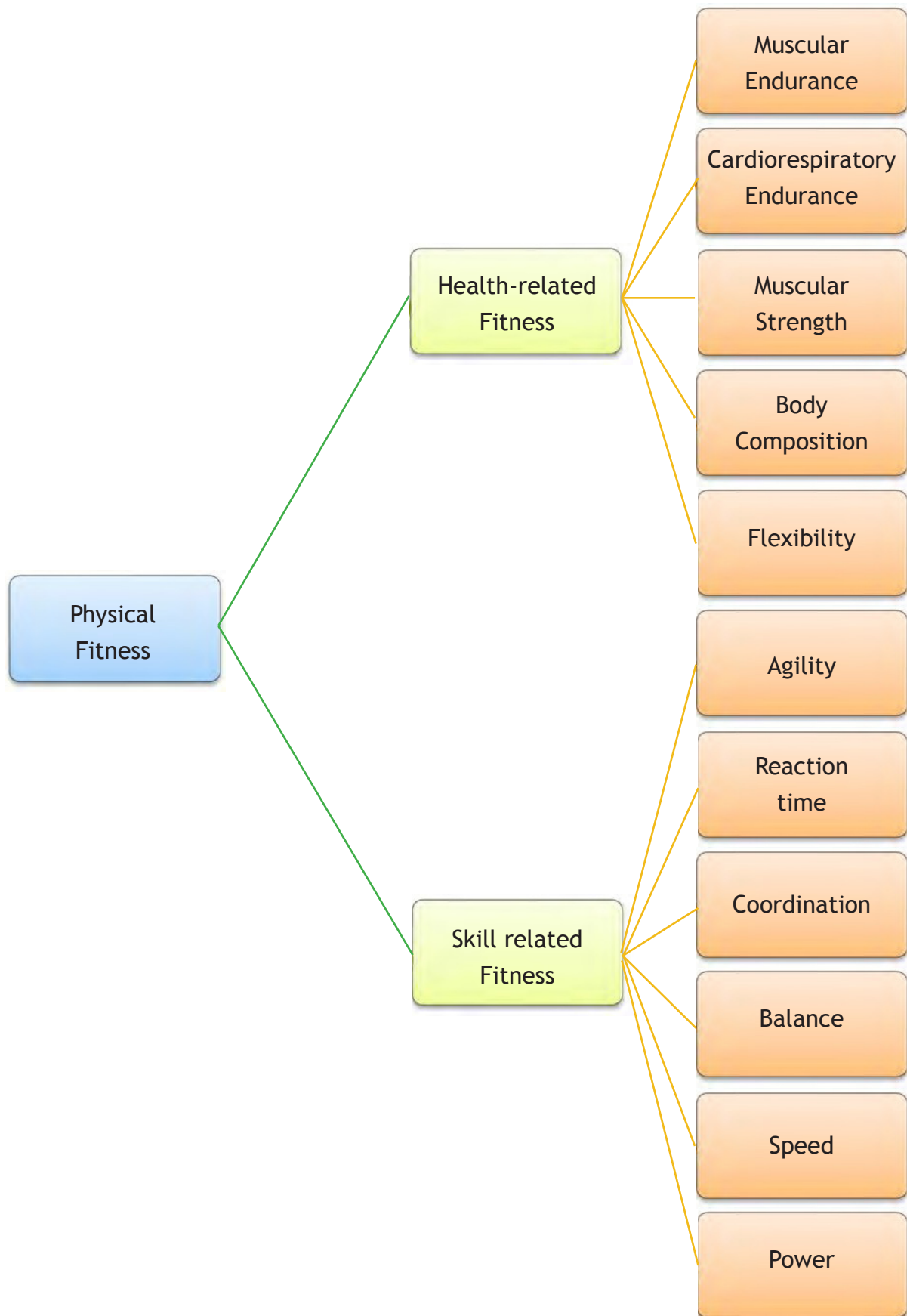
Health is important in every individual's life as it gives us the strength and energy to fully enjoy and make us grateful for the life we have. To elaborate on the components of the health we can classify it into four dimensions.

1. **Physical health:** There is a saying that one thing which will stay with you for your entire life is your body. So, if your body is healthy then you can do all your daily work with energy and can enjoy the remaining time with your family and friends. To stay physically healthy, you should exercise daily, walk as much as you can and eat healthy.
2. **Mental health:** A sound mind stays in a sound body, so if you physically healthy than it will in turn help you to stay mentally healthy. Your thoughts will be clearer and you have more confidence in dealing with the day to day situations. For mental health you should include meditation and yoga in your daily life which will keep you mentally calm and improve your mental health.
3. **Social health:** We live in a world where we have to interact with people and we should understand and appreciate the people we live with; social health is an important aspect as it gives us the strength to build strong relations with people and to enjoy the companionship which is important for an individual to live and sustain a healthy life.
3. **Emotional Health:** A emotionally strong person has the control on the circumstances and can deal with different situations with an ease. It gives us that power to stay alike no matter the situation an individual is in. We should work on our emotional health as it will makes us more balanced human beings and also affects our decision-making ability.





5.2.3 COMPONENTS OF PHYSICAL FITNESS



1. **Health-related Fitness** - There are five components of health-related physical fitness - muscular endurance, cardiorespiratory endurance, flexibility, muscular strength, and body composition. Health related fitness is an integral part of an individual's daily life, we use these fitness components every day without consciously knowing about them, but if we understand these fitness components and work towards their improvement then we can lead a full and healthy life. e.g., cardiovascular endurance is as important for a doctor as it is for a sportsman or a farmer. A higher level of health-related fitness is directly related to the degree of skill performance. e.g., moderate level of muscular strength is required to maintain posture and to prevent neck, back or knee pain etc. but a high amount of muscular strength helps to increase performance in weightlifting, jumps, throws etc.
2. **Skill-related Fitness** - Skill related fitness has six components namely agility, balance, coordination, reaction time, power and speed. These are associated with performance. An individual who has achieved a good skill-related fitness is able to achieve high level of motor skills, which are a prerequisite in sports and in certain jobs. Though, skill-related fitness is generally known as sports fitness or motor fitness, it is very specific and multi-dimensional. e.g., agility is required in combat sports as well as in the job of a fire fighter.

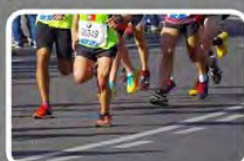
5.3.4 COMPONENTS OF HEALTH-RELATED FITNESS



Body Composition



Muscular Endurance



Cardiorespiratory Endurance



Muscular Strength



Flexibility





1. **Body Composition** - Body composition may be defined as the relative percentage of fat and lean body mass. Lean body mass is fat-free mass of our body which covers muscle, bone, and other tissues that make up the body except fat. A healthy individual should have relatively low percentage of fat in the body. It is important for an individual to regularly check her/his own body composition because body fat is associated with incidence of heart disease, diabetes, hypertension etc.
2. **Muscular Endurance** - Muscular endurance is the ability of the muscles to exert themselves repeatedly. A fit person can repeat movements for a longer period without undue fatigue. The definition of muscular endurance is the ability of a muscle group to execute repeated contractions over a period of time sufficient to cause muscular fatigue, or to maintain a specific percentage of the maximum voluntary contraction for a prolonged period of time. To measure muscular endurance following equipment are used: Free weights (barbells, dumbbells), Gym mat (curl-ups, push-ups), Stopwatch.
3. **Cardiorespiratory Endurance** - Cardiorespiratory Endurance is the ability of the heart, blood vessels, blood, and respiratory systems to supply nutrients and oxygen to the muscles and the ability of the muscles to utilize fuel to allow continuous exercise. A healthy individual can sustain physical activity for a longer duration without undue stress. Lack of cardiorespiratory fitness may cause restriction in daily activities due to inefficiency of the heart to supply blood to different body parts. Cardiorespiratory endurance activities are also called aerobic exercises. e.g., walking, jogging, swimming, cycling, cross-country race, skiing, water aerobics, climbing stairs and skipping a rope.
4. **Muscular Strength** - Muscular strength is the ability of the muscles to exert an external force or to lift a heavy weight. A fit person can do any work that involves exerting force like lifting or controlling own body weight, pushing almirah at home, lifting gas cylinder etc. The definition of muscular strength is the maximal force that can be generated by a specific muscle or muscle group. Muscular endurance is defined as the ability of a muscle or group of muscles to repeatedly exert force against resistance. Muscular strength is defined as the maximum amount of force that a muscle can exert against some form of resistance in a single effort.
5. **Flexibility** - Flexibility is the ability of a joint to move effectively through its full range of motion without incurring pain. Movement happens due to muscle length, joint structure, and other factors. A healthy person can move the body joints through their full range of motion in work and in sports. Due to lack of flexibility, performance of daily life activities decreases, and there is occurrence of problems like lower back pain. While whole body flexibility cannot be tested in one run, but "sit and reach" test is broadly used test to assess the flexibility of hamstring, hip, and lower back muscles.

Do you know?

Fast Twitch fibres: muscle fibre that contracts quickly especially during brief high-intensity physical activity requiring strength such as sprinting.

Slow Twitch fibres: muscle fibre that contracts slowly especially during sustained physical activity requiring endurance such as long-distance running.

Do you know?

Static Contraction: where muscle exerts force, but movement does not take place. Example: pushing a wall, pulling a rope

Dynamic contraction: an individual can see movement when muscle exerts the force. Example: pushups, pull-ups

Concentric Contraction: When muscle contraction takes place, shortening of muscle happens; that is concentric contraction. Example: when lifting a heavy weight, concentric contraction of the biceps causes the arm to bend at the elbow, lifting the weight towards the shoulder.

Eccentric contraction: in the process of contraction, the opposite muscle's lengthening takes place; that is known as eccentric contraction. Example During Biceps curl eccentric contraction happens when muscle relaxes and muscle lengthening takes place.

5.3.5 COMPONENTS OF SKILL-RELATED FITNESS



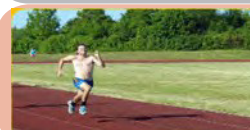
Reaction Time



Power



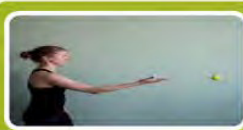
Balance



Speed



Agility



Coordination





1. **Reaction Time**- Reaction time is an individual's ability to quickly respond to a stimulus. It is the interval time between the presentation of a stimulus and the initiation of the muscular response to that stimulus. e.g., in a sprint start, focusing on the starter's voice and the sound of the gun and reacting, reaction to a football, reaction of the goalkeeper during the penalty kicks in a football match.
2. **Power** - Power refers to an individual's ability to act fast with resistance. It is a combination of strength and speed. Throwing shot put, long jump, kicking in karate are power dominant activities.
3. **Balance** - Balance is an individual's ability to maintain the state of equilibrium while moving or in a stationary position. There are two types of balance one is static, and another is dynamic.
4. **Static balance** is where individual maintains the state of equilibrium in a stationary position.
5. **Dynamic balance** refers to maintaining equilibrium during motion.
6. **Speed** - Speed refers to an individual's ability to perform the movement in the shortest possible time. It is the minimum time taken to complete the task. Examples are 100 m and 200 m sprint, ice hockey etc.
7. **Agility** - Agility is an individual's ability to change the direction of the body rapidly and accurately. It is a combination of speed, balance, power and co-ordination. Rugby, football, hockey are the examples of sports requiring agility.
8. **Coordination** - Coordination is the ability of an individual to perform a motor task by using body movements and senses accurately and fluently. Juggling in football, hitting a tennis ball, and kicking of football are good examples coordination.

I. **Tick the correct options.**

1. Which of the following is NOT a component of Wellness
 - a. Physical
 - b. Cosmetic
 - c. Mental
 - d. Occupational
2. Occupational wellness is related with
 - a. fitness
 - b. meditation
 - c. environment
 - d. job



3. Which is NOT a health related Physical Fitness component?
 - a. Muscular endurance
 - b. Cardiorespiratory endurance
 - c. Speed
 - d. Flexibility
4. Which is a component of Skill related Fitness?
 - a. Muscular Strength
 - b. Power
 - c. Body Composition
 - d. Flexibility

II. Answer the following questions briefly.

1. Define the physical component of wellness
2. Define the spiritual component of wellness
3. Define muscular strength and Speed.
4. Explain the social component of Health.
5. What is the difference between Physical fitness components: Speed and Agility?

III. Answer the following questions in 150-200 words.

1. Describe Health related fitness components?
2. Differentiate between skill-related and health-related components of physical fitness.
3. Describe the seven components of wellness

Extension Activity

Your school wishes to draw up an action plan for promoting wellness among all its students. Working in groups, help the school authorities draw up a plan wellness plan by suggesting activities.

Wellness Component	Activity suggested
Physical Wellbeing	
Emotional Wellbeing	
Mental Wellbeing	
Intellectual Wellbeing	
Environmental Wellbeing	





Occupational Wellbeing	
Spiritual Wellbeing	

5.3.1 Traditional sports and regional games for promoting fitness

The origin of sports and games dates to the inception of the society. Some games originated from sheer need of survival e.g., Archery, and some for the need of social interaction e.g., Antakshri. The desire to express emotions laid a strong foundation in the origin of different dance forms and traditional games. These games are the reflection of the beliefs and the culture of the society. India has always been a land of sports and games. Many games and sports that originated in our country, have their distinct regional identity, and are now played in many countries. India's sports history dates to the Mahabharata period where games like chaupar and archery were very famous. Many studies also suggest that India invented many games according to the availability of resources and the demography of the region, for example the boat race known as Vallamkali is very famous in Kerala and till date it is organised every year on the occasion of Onam.

5.3.2 Types of traditional sports and regional games

Many types of games were invented and played in India. In recent times we have adopted some of those games which have their origin from the traditional sports and games in their original form and some others with minor changes.

1. **Board games:** Early natives of our region developed two major board games which are still played by the whole world. First is chaupar which is the origin of ludo and the other one is Shatranj which is now known as chess.
2. **Combat Games:** There is a misconception that the combat sports were invented to hurt other human beings, but, they were, in reality, more for self-defence. Some of the combative sports invented in India gained popularity when these art forms travelled abroad. e.g., Kalarippayattu is one of the oldest martial arts of India invented in Kerala and is considered to be the originator of judo and karate.
3. **Games involving help of animals:** Animals have always been an integral part of many cultures and societies. Their use for showing athletic skills has been a base for many sports. Horse riding is an ancient sport which was popular around the world for centuries but their inclusion in games in India came with polo which is still being played today.
4. **Racquet Games:** Racquet games are some of the fastest and exciting games which are played in today's time. Some major racquet games have their roots in India. e.g., Ball Badminton, a game played with the help of a racquet and



a rubber ball, was invented in India. Some also believes that modern day Badminton also had its origin in India's Pune.

5. **Team Games:** Team games encourage a sense of belongingness in an individual and some team games also originated in India. e.g., Kho-Kho and Kabaddi are the games which are believed to have originated in India.
6. **Play Games:** Some games are played by children in their early childhood which are an integral part of our culture and roots. e.g., Gilli Danda played with the help of one small stick and one big stick is very popular in India. Similarly, Atya Patya, which has a mention in Tamil literature is played in different part of the country with different names.
7. **Indian gymnastics:** Gymnastics has always been understood as a part of ancient Greece and is very popular in Russia and other European nations, but in India we have a sport named Mallakhamb which originated in Maharashtra, which literally means malla, or gymnastics and khamb, or a pole. Thus, mallakhamb means gymnastics on a pole.

5.3.3 Importance of traditional sports and regional games

Regional and traditional sports have always been important for the development of the individual and society. These games and sports gave a sense of belongingness and achievement to the people and are important for their physical and mental health. The importance of these games lies in the following areas.

1. **Physical Aspect:** We all have heard the saying "Survival of the fittest". From ancient times, there was always the need for being physically fit, whether it was because of the harsh climatic conditions, the need to search for the food or the ability to fight against an opponent. These traditional games always gave humans the needed edge and made them physically fit to face any adversity. e.g., Thang-ta originated in Manipur is an ancient martial art which is played with the help of sword and spear.
2. **Social Aspect:** Man is a social animal and has a constant need of companionship. Many games and sports were invented to give a general sense of purpose to the individual, whereas some games were designed to promote social interaction and peer interaction. These games help kids from very young age to enhance their social skills and help them form relationships.
3. **Psychological aspect:** Our ancestors understood very early on that physical activity is the path to improving and fulfilling the psychological needs of an individual. Now we have data from many studies that shows that physical activity is good in enhancing self-confidence, self-esteem, motivation, personality, and leadership skills. Traditional games gave platform to human beings to showcase





their talent and get that recognition from their peers and society which most individuals desire.

4. **Emotional Aspect:** Emotional health is very important for any individual to sustain a healthy life. They can transfer the knowledge that they acquire by participating in traditional and regional games into their life. Being emotionally strong means that an individual can keep his nerves under control or stay focused in very harsh conditions or situations.
-

I. **Tick the correct options**

1. Which of the following is played with the help of animals?
 - i. Mallakhamb
 - ii. Atya Patya
 - iii. Polo
 - iv. Kalarippayattu
2. Which game is the origin of Ludo?
 - i. Chaupar
 - ii. Gilli Danda
 - iii. Kalarippayattu
 - iv. Shatranj

II. **Answer the following questions briefly**

1. Describe the physical aspect of traditional games.
2. Distinguish between racquet games and combat games.
3. Explain about the play games played by the kids in neighbourhood?
4. Traditional games improve your social life. How?
5. Write a short note about Indian gymnastics?

III. **Answer the following questions in 150-200 words.**

1. Write down the importance of traditional games?
 2. Explain about traditional games played in India?
-

5.4.1 Leadership

You have to Programme your mind into victory.

This game is all about how bad you want it, it's about grit. It's about HEART. The difference between winning and losing is how far you're willing to go!



Your HUNGER will be tested on the field. Your DESIRE to win, will determine the outcome of the game.

We keep on fighting even if the odds are stacked against us.

They don't know that we have the heart, the courage and the will to make things happen!

We will destroy everything that comes in our way, BECAUSE WE WERE BORN TO WIN, WE WERE BORN TO DOMINATE!

We might be the underdogs; we might be the "weaker" team.

But one thing is for sure: When we step on the field we FIGHT. We fight for ourselves and WE FIGHT for each other YOU WILL NEVER PLAY THIS EXACT GAME AGAIN IN YOUR LIFE.

Read the paragraph above.

Have you gained an insight into the making of a leader? Would you like to make any changes to your quote about the qualities of a leader above?

Do you know?

Leader-The person who leads or commands a group, organization, or country.

Delegate - assign/allocate a responsibility
Commitment - quality of being dedicated to a task
Accountable-responsible, expected to justify actions.

Let's read further about Leadership.

LEADERSHIP

Leadership is the art of motivating a group of people to act towards achieving a common goal.

He/she is the person in the group who possesses the combination of personality and leadership skills that makes others want to follow his/her direction.

Leadership can be defined as a certain set of characteristics, behaviour or style that one exhibits on a day-to-day basis, through one's thoughts, words, and actions.

"A leader is one who has power in authority." - H.T Mazumdar

"Leadership is the behaviour that affects the behaviour of the people more than their behaviour affects that of a leader." - LaPierre



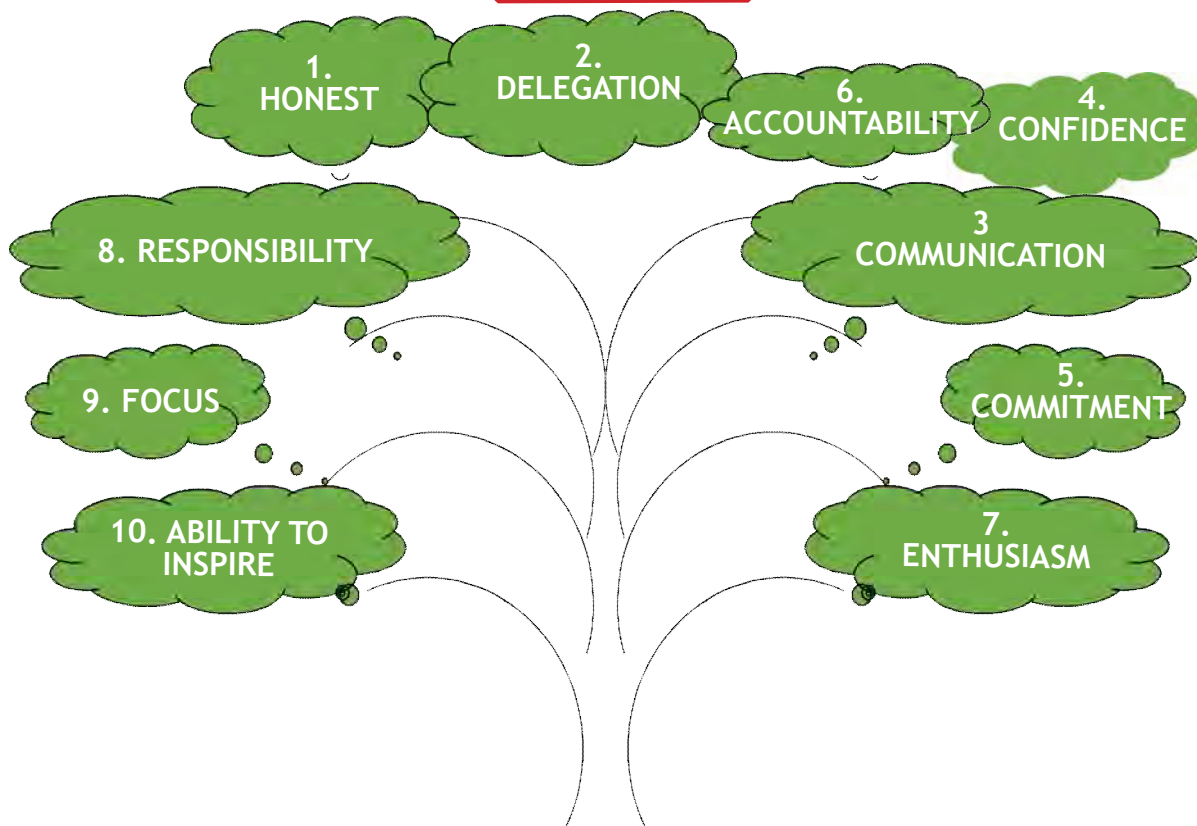
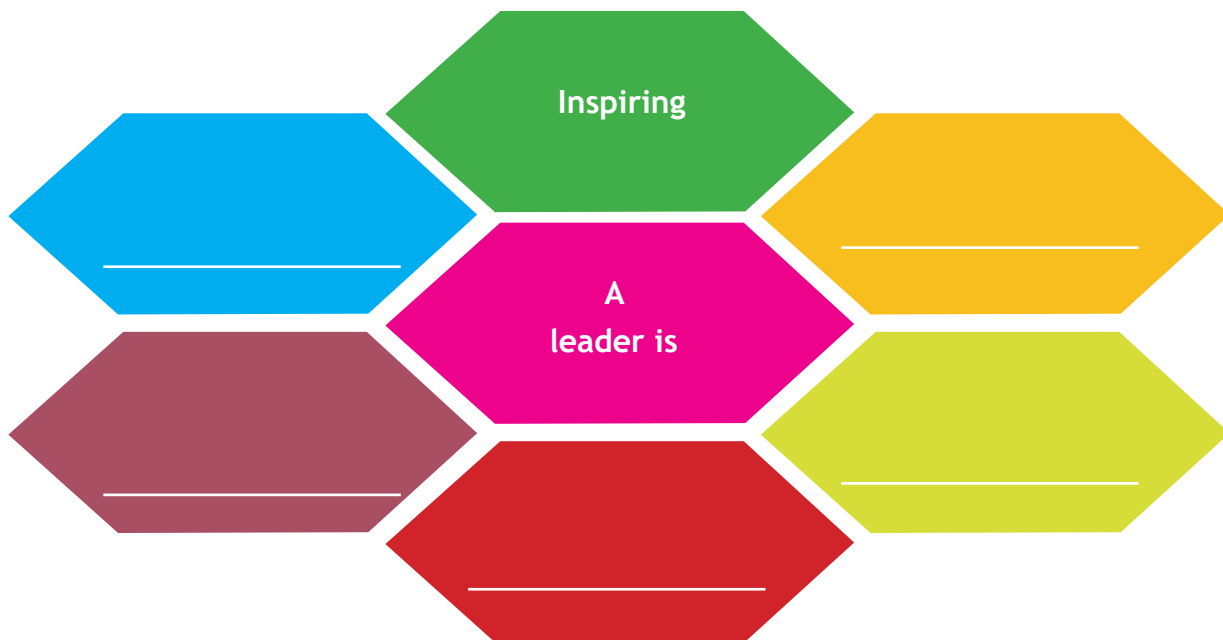


"A leader is one who knows the way, goes the way, and shows the way."

- John C. Maxwell

5.4.2 Qualities of a good leader

What, according to you are the qualities of a leader? Based on the quotations you read, and your own views, complete the web chart given below listing essential qualities of a leader.





1. Honesty:

One of the qualities that defines a good leader is her/his honesty. When a leader is responsible for a team of people, it is important for her/him to be straightforward. If she/he makes honest and ethical behaviour a key value, the team will follow.

Extension Activity

Work in groups of six. Interview the Captains of your school's/a nearby school's Cricket Team, Football Team, Hockey team etc.

1. What are the most important values you demonstrate as a leader?
2. How have you gained commitment from your team?
3. What is your greatest strength?
4. How do you get your teammates to accept your ideas?
5. How would you go about uniting your team who may have internal disagreements?
6. How do you motivate your team?
7. What is the most difficult part of being a leader?
8. What is a leader's best asset?
9. How would you proceed to reorganize your team?
10. How do you go about resolving conflict?
11. Name a time when an employee disagreed with your directive and how you handled it?
12. Who are the most important members of your team?
13. How do you delegate responsibilities to your team?
14. How did you handle a time when you had to make an unpopular decision?

Discuss what you have learnt and share your views with the class about the qualities of a successful Captain.

2. Delegation of duty

It is important for a leader to focus on key responsibilities and delegate work, duties and, even, authority to other team members. A good leader delegates tasks to her/his teammates and oversees how they perform.





3. Communication Skills

Communication is the key to success. Without clear communication skills, no one would understand their mission, goals, and vision. Communication should also be consistent when assigning a task or passing instructions.

4. Confidence

Another quality that defines a good leader is her/his confidence. To be an effective leader, she/he should be confident enough to ensure that others follow her/his instructions, and the team places their trust in her/him.

5. Commitment

There is no greater motivation for the team than seeing their leader working alongside everyone else. By proving her/his commitment to the team, she/he not only earns the respect of the team, but also instils that same drive among the team members.

6. Accountability

A good leader takes responsibility for everyone's performance as well as her/his own. When a leader takes personal accountability, she/he is willing to take responsibility for the outcomes of her/his choices and behaviour. Leaders do not blame others when things go wrong. Rather, they make things right - they are fixers. Accountability goes beyond the leader's actions and decisions.

Extension Activity

Look at the picture.

MS Dhoni tells his players: "Don't think about winning or losing. Just go out, play your best cricket and enjoy the match. Sometimes you win, sometimes you lose. It does not matter as long as you are giving your 100%."



What do you think the Captain is saying to the team? What would you tell your team if you were the Captain? Share in your group.

Share the best advice with the class.

"With great power comes great responsibility"

- Anonymous

"A good leader takes little more than his share of the blame and little less than his share of the credit."

- Arnold H Glasow

7. Enthusiasm

The term enthusiasm is derived from the Greek origin meaning possessed by a god, is used for a leader who is motivating, energetic, passionate, and dynamic. A good leader is enthusiastic about her/his own work and performance and also about her/his role as leader.

8. Focus

A good leader is generally focused and is able to think rationally. A leader should also be self-driven to work harder in wanting to achieve better results.

9. Ability to inspire

Probably the most difficult job for a leader is to persuade others to follow. This is possible only if the leader is able to inspire her/his followers by setting a good example.

10. Responsibility

Last, but not least, the quality that defines a good leader is responsibility. A good leader understands that leadership is about responsibility, and not power. A leader takes responsibility for her/his actions which includes both failures and successes.

Extension Activity

“Be the change you wish to see in the world.” - Gandhi Look at the cartoon given below. Leadership is the process by which one individual influences the behaviour, attitudes and thoughts of others. A leader’s actions are held to an unspoken standard of what is appropriate and what is not. In present day cricket, where sledging is very common, Rahul Dravid’s boys showed exemplary behaviour.

Discuss the role of a leader in the light of the above statement.





5.4.2 Creating leaders through physical education

Leadership is a complex process that involves the effort of an individual to help groups identify and achieve personal and group goals. Physical activity and sport programmes offer great opportunities for youth to develop important life skills, including leadership.

The battle of Waterloo was won on the playing fields of Eton.

- The Duke of Wellington

Leaders have both innate and acquired qualities. Through physical education acquired qualities can be created and developed successfully. Sports and physical activities are highly interactive, provide numerous leadership opportunities or “moments” for young people to gain leadership experience e.g., enforcing rules for teammates provides an opportunity for a young captain to learn leadership in an enjoyable, motivating way.

For creating or making effective and efficient leaders in the field of physical education, stress must be laid down on the following points:

1. Analysing leadership skills required for further development: It is essential to analyse leadership skills that are already well developed among the students and those which need further development.
2. Identifying the students or groups of students whose leadership skills require to be improved: Once players are involved in leadership activities, they must be given the chance to further improve their leadership skills by being given opportunities for leading teams and organising various sports competitions, and then observing signs of improvement in their leadership skills.
3. Offering opportunities for leadership roles: For improving leadership skills it is important
 - students are offered leadership roles such as supervising and managing sports activities. They may be appointed captains of different sports teams, given various responsibilities such as membership of various committees, official duties and ground preparation duties, supporting other students in their play, organising festivals and assisting teachers and coaches in running clubs and teams.
 - leadership courses are organised for students. Care should be taken, however, to ensure that these courses lead to an application of the knowledge, skill and understanding.
 - students are given opportunities to develop their skills by giving them tasks that show progression in challenge and complexity.





- leaders are recognised by giving them a symbol of recognition like a cap or other uniform. This will serve to motivate other students.
- 4. Having faith and confidence in the students: It is essential to believe in the leadership skills of the students and to give them a chance for improving them.
- 5. Rewarding them for their success: Rewarding students for showing improvement by giving them more responsibilities helps develop their potential.

Parental involvement also plays a key role in training successful leaders. Parents should be included in physical activity instruction and in co-curricular and community physical activity programmes in order to ensure their help and encouragement in their children's participation in enjoyable physical activities. Parental involvement in children's physical activity is key to the development of a psycho-social environment that promotes physical activity among young people. Involvement in these programmes provides parents opportunities to be partners in developing their children's knowledge related to physical activity, attitudes, motor skills, confidence, and behaviour. Thus, active collaboration between teachers, coaches, parents and other school and community personnel will encourage students to become great sports leaders. We can certainly do much more "intentionally" to help young people develop their leadership capabilities and skills. We can only make them not just physically fit but can teach them life skills, like leadership, that will enable them to be more productive members of society.

I. Tick the correct options.

1. Sports and physical activities provide numerous leadership opportunities as they
 - i. identify students for improvement
 - ii. analyse leadership
 - iii. develop individual skills
 - iv. are highly interactive
2. A leader who is honest in speech and upright in character exhibits
 - i. patience
 - ii. servitude
 - iii. integrity
 - iv. enthusiasm
3. A good leader is one who
 - i. is unable to trust or show any confidence in her/his team mates
 - ii. is only enthusiastic about her/his own performance





- iii. is focused and is able to think rationally
- iv. is assertive and doesn't care about the respect of the team mates
- 4. The leader instils positivity among the team by
 - i. holding difficult training sessions
 - ii. pulling up players making mistakes
 - iii. telling players their strengths
 - iv. sitting and observing the team from the sidelines.
- 5. The leader regulates group behaviour by
 - i. ignoring individual differences within the group
 - ii. enforcing rules firmly through rewards and punishment
 - iii. dealing with matters of group discipline in an arbitrary manner
 - iv. overlooking a member spreading indiscipline within the team

II. Answer the following questions briefly.

- 1. Who is a leader?
- 2. Why must a good leader be accountable?
- 3. A good leader delegates duties and responsibility. Do you agree?
- 4. How does a good leader regulate team behaviour?
- 5. A leader's responsibility is to see that the plans of the group are put into execution. Elaborate.
- 6. The leader's foremost function is to structure the situation for the group members. How does she/he do this?

III. Answer the following questions in 150-200 words.

- 1. What role does a leader play in leading her/his team to success?
 - 2. Explain the role of the leader in holding her/his team together.
 - 3. Who is your role model as a leader? What are her/his characteristics? What have you learned from her/him?
 - 4. Discuss the role of a leader.
-



5.5.1 First Aid

The term First Aid was officially adopted in England for the first time in 1879 by St. John's Ambulance Association. It refers to the treatment which is given to the casualty suffering from either a minor or serious illness or injury, to preserve life, prevent the condition from worsening, or to promote recovery prior to professional medical help becoming available. It includes initial intervention in a serious condition such as performing cardiopulmonary resuscitation (CPR) while waiting for an ambulance, as well as the complete treatment of minor conditions, such as applying a plaster to a cut. A First Aid procedure is generally performed by someone with basic medical training.

Do you Know?

The Red Cross and Red Crescent are still the largest providers of First Aid worldwide.

Extension Activity

Do you know how to apply a bandage?

Do you know what treatments are given for bruises and cuts?

Find out, discuss in your class, and demonstrate.

First aid is the process of carrying out essential emergency treatment. It is immediate and temporary care given to the victim of accident, injury or sudden illness.

The person who gives treatment to the person suffering from a disease or the victim of an accident, to improve his condition is called an 'aides' and the medical treatment given as aid is called - the 'first aid'.

The initial assistance given to a victim of an injury or illness, comprises of relatively simple techniques that can be performed with rudimentary equipment.

First Aid can be carried out by any person until professional medical assistance arrives. Its purpose of First Aid is to preserve life, assist recovery and prevent aggravation of the condition, until the services of a doctor can be obtained or during transport to hospital or casualty's home.

First Aid is the immediate temporary care given to the victim of an accident or sudden illness.

It helps ensure that the right methods of administering medical assistance are provided.





Its basic purpose is to provide immediate medical aid by a competent and qualified medical personnel till the casualty reaches Hospital.

Aims and Objectives

- To prepare properly for any emergent situation to avoid errors and act quickly and calmly.
- To assess and address life-threatening conditions first
- To minimize further injury, infection and complications
- To make the victim as comfortable as possible, thereby enabling him to save energy.
- To transport the victim to a medical facility as per necessity.

Extension Activity

Complete the Graphic Organiser given below listing some common sports injuries and the First Aid treatment to be given.

Common Sports Injuries	First Aid

5.5.2 P.R.I.C.E.

The traditional protocol of dealing with sports injury, R.I.C.E., has now been modified to P.R.I.C.E. This refers to the addition of the word “Protection” to Rest, Ice, Compression and Elevation. Protecting the injured area from further damage is crucial to the healing process.

Protection: Protect the affected area from further injury by limiting or avoiding weight-bearing through the use of crutches, a cane, or hiking poles. Partially immobilizing the injured area by using a sling, splint, or brace may also be a means of protection.

Rest: Stop using injured part or discontinue activity. It could cause further injury, delay healing, increase pain and stimulate bleeding. Use crutches to avoid bearing weight on injuries of the leg, knee, ankle and foot. Use splint for injuries of the arm, elbow, wrist and hand.



Ice: Ice application contracts blood vessels. This helps stop internal bleeding from injured capillaries and blood vessels. It hastens healing time by reducing swelling around injury. However, remember to keep a damp or dry cloth between skin and ice pack. Do not apply ice for longer than 15 to 20 minutes at a time. Apply every hour for 10 to 20 minutes. Apply ice as long as pain or inflammation persists.

Compression

Hastens healing time by reducing swelling around injury. Decreases seeping of fluid into injured area from adjacent tissues. Use elasticised bandage, compression sleeve, or cloth. Wrap injured part firmly. Do not impair blood supply. Too tight bandage may cause more swelling. Wrap over ice. Loosen the bandage if it gets too tight.

Elevation

Elevate injured part above the level of heart. Decreases swelling and pain.

Use objects and pillows.

I. Tick the correct options.

1. Dressing and band ages are used to
 - i. increase the victim's pain.
 - ii. increase internal bleeding.
 - iii. control bleeding and prevent infection.
 - iv. stitch up a deep wound
2. The best way to stop external blood loss is to
 - i. apply direct pressure over the wound
 - ii. take the patient to hospital
 - iii. wash the wound with water.
 - iv. apply cream on wound
3. R.I.C.E. treatment refers to
 - i. Rest, Ice, Crutches, Elevation
 - ii. Rest, Ice, Compression, Elevation
 - iii. Rest, Ibuprofen, Crutches, Exercise
 - iv. Recovery, Ice, Compression, Exercise





II. Answer the following questions briefly.

1. Write a short note on PRICE.
2. What is First aid?

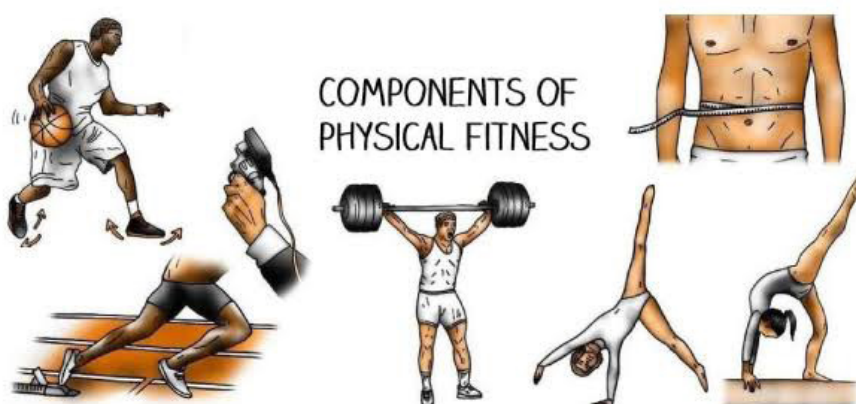
III. Answer the following questions in 150-200 words.

1. Explain the concept of First aid along with aim and objectives.

IV. Complete the following table listing components of Wellness and Fitness.

Components of Wellness	Components of Physical Fitness

V. Case Study



While selecting test items for the fitness test Mr Laxman asked his students of physical education to list down test items and explain why they chose that particular activity. By doing so he is also trying to make students understand the impact of each activity and relationship between components of physical fitness.

On the basis of given information answer the following questions:-

1. List down any two exercises for Explosive strength.
2. List down any two exercises for muscular endurance.
3. Muscular strength can be measured through _____.
4. Shuttle run tests are used to measure _____.
5. Medicine ball throw test is used to test _____.

VI. Art Integration - AEROBIC EXERCISE

Dancing is an aerobic activity that improves your balance and co-ordination. It's suitable for people of all ages, shapes and sizes.

Whether you like to jump or jive, tap or tango, do the hip hop or salsa, dancing is one of the most enjoyable ways for losing weight, maintaining strong bones, improving posture and muscle strength, increasing balance and co-ordination, and beating stress.

Working in Groups,

- choose the dance style you wish to incorporate into your exercise routine.
- learn/improvise steps.
- choose/create your own music.
- set the dance steps to music.

Perform your Aerobic Dance Activity in the school PE period.

https://www.topendsports.com/	
https://www.verywellfit.com/what-a-fitness-test-can-tell-you-about-your-health-3120283	
https://www.nationalwellness.org/page/Six_Dimensions	
https://www.nationalwellness.org	
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<http://www.businessdictionary.com/definition/lifestyle.html>



<https://www.hhs.gov/fitness/index.html>



UNIT 6

TEST, MEASUREMENT AND EVALUATION



Content

Define Test, Measurement & Evaluation

Importance of Test, Measurement & Evaluation in Sports

Classification of Test in Physical Education and Sports

Test administration guidelines in Physical Education and Sports

BMI, Waist-Hip Ratio, Skinfold Measures (3-site)



Learning Outcomes

After completing this chapter, you will be able to:

- After completing this chapter, you will be able to:
- define the terms test, measurement, and evaluation,
- differentiate norm and criterion referenced standards,
- differentiate formative and summative evaluation,
- discuss the importance of measurement and evaluation processes,
- understand BMI: A popular clinical standard and its computation
- differentiate between Endomorphy, Mesomorphy & Ectomorphy
- describe the procedure of Anthropometric Measurement

Discussion

1. Working in groups, complete chart given below listing the importance of testing and measurement in sports.



2. What are the tests that could be administered to the athletes?

6.1.1 WHAT IS A TEST

Remember when you tried sit-ups for the first time. As a child, you probably did a number of sit-ups. You were performing sit-ups to improve your strength endurance. Do you remember your Physical Education teacher counted your sit-ups in your Physical Education class and said, "You were very good!" Numbers are a part of everyone's life and they can be used in measurement. Measurement is a way of giving meaning to numbers. Further, decision making is a daily task. Many people make hundreds of decisions daily; and to make wise decisions, one needs information. The role of measurement is to provide decisionmakers with accurate and relevant information to make informed choices.





Do you know?

A **test** is an instrument or tool used to make a particular measurement. This tool may be written, oral, a mechanical device (such as a treadmill), physiological, psychological, or another variation.

Measurement is the act of assessing. Usually this results in assigning a number to the character of whatever is assessed.

Evaluation is a statement of quality, goodness, merit, value, or worthiness about what has been assessed. Evaluation implies decision making.

Example 1: A physical education teacher records the 30 sit-ups that a student completes in 1 min and reports the score as Good. In this example, Test is Sit-ups, Measurement is 30 sit-ups and Evaluation is Good.

In our day-to-day life we all collect data and information before making decisions. e.g., you might gather information about your friend's marks, health, fitness, type of vehicle her/his family uses, number of the vehicle, number of students in a class etc. Physical Educationists collect data related to fitness characteristics because of the relationship between fitness, physical activity and quality of life. The variables measured might include the amount of physical activity, blood pressure, weight height, strength etc. Physical educationists might be interested in measuring different items for taking better decisions. Thus, to make qualified decisions, it is extremely important to measure and evaluate the components of the individual's physical fitness in an accurate manner. Making effective decisions depends on first obtaining relevant information, and then evaluating it. This is where testing and measurement enter the picture. The most basic principle of this text is that measurement and evaluation are essential to sound educational decision making.

6.1.2 TEST, MEASUREMENT AND EVALUATION

The terms test, measurement, evaluation, and assessment are occasionally used interchangeably, but most users make distinctions among them.

Test is usually considered the narrowest of the three terms; it implies the tools, instruments or set of questions to measure a dimension, quality or condition, of any person, object, event.

Measurement refers to the quantitative form of assessment and also refers to the scores obtained through test. Measurement is requisite for evaluation in a quantitative form of numbers or scores.



Evaluation is “the process of delineating, obtaining, and providing useful information for judging decision alternatives.” Other definitions simply categorize evaluation as professional judgment or as a process that allows one to make a judgment about the desirability or value of something. Thus, measurement is not the same as evaluation. Two athletes may obtain the same measure (test score), but we might evaluate those measures differently because of the different criteria for evaluation available in terms of norms and criterion measures.

Definitions

A test is a tool to evaluate the skill, knowledge, capacities or aptitudes of an individual or a group.

- Webster’s Dictionary

Test refers to any specific instrument, procedure or technique used by an administrator to elicit a response from the test-taker.

- H M Barrow and Megee

Test is the form of questioning or measuring used to assess retention of knowledge, capacity or ability of some endeavour.

- Barry L Johnson and Jack Nelson

A test is an instrument or a tool used to make a particular measurement. The tool may be written, oral, mechanical, or an other variation. Measurement refers to the process of administering a test to obtain quantitative data.

- H M Barrow

Measurement aids evaluation process in which various tools and techniques are used in collection of data.

- Barry L Johnson and Jack Nelson

An evaluation is an assessment, as systematic and impartial as possible, of an activity, project, Programme, strategy, policy, topic, theme, sector, operational area, institutional performance..

- United Nations Evaluation Group

Evaluation is the process of education that involves collection of data from the products which can be used for comparison with preconceived criteria to make judgement.

- H M Barrow and Megee





I. Tick the correct option.

1. Mohan's height is 3ft 11in. 3ft 11 in is an example of
 - a. test
 - b. measurement
 - c. evaluation
 - d. assessment
2. Test is a _____
 - a. Tool
 - b. Technique
 - c. Adjustment
 - d. Assessment

II. Answer the following questions briefly.

1. What is a test?
2. What is measurement?
3. What is Evaluation?

III. Answer the following questions in 150-200 words.

1. Describe the relationship between test, measurement & evaluation.

6.2.1 Importance of test, measurement & evaluation in sports

The importance of test, measurement and evaluation should be considered from three different perspectives,

- i. from an athlete or participant's perspective;
- ii. from the PE teacher/Coach/ Trainer's perspective; as well as
- iii. from the Training programme's perspective.

Let's try to understand these three perspectives in detail.

A. Importance of Test, Measurement and Evaluation from athlete's perspective

- i. Motivation of athletes for continuity.
- ii. Self Appraisal of performance
- iii. Goal Setting for performance enhancement

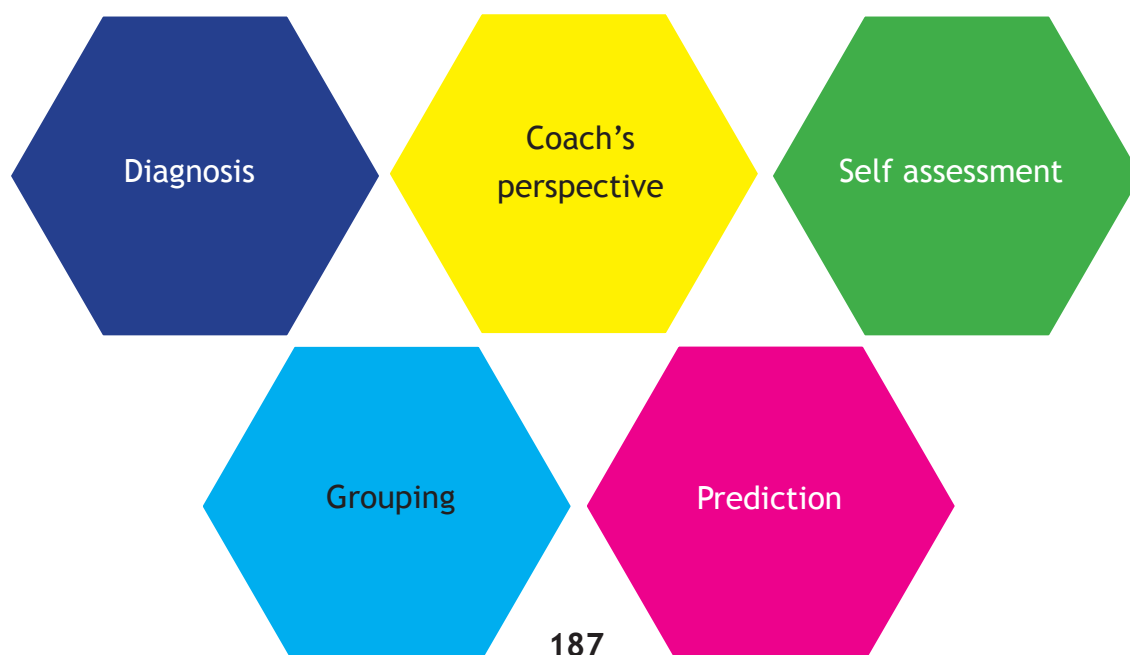




Tests, Measurement, Evaluation are of immense importance for athletes and sports participants. If there is an appropriate test being applied at an appropriate time and at an appropriate frequency, it will be a greatly motivating for the athletes to continue with their activity. It will also be a mode of self-appraisal of their own performance, and surely it will help athletes and participants to set up new goals for their performance enhancement.

B. Importance of Test, Measurement and Evaluation from coach/trainer's perspective

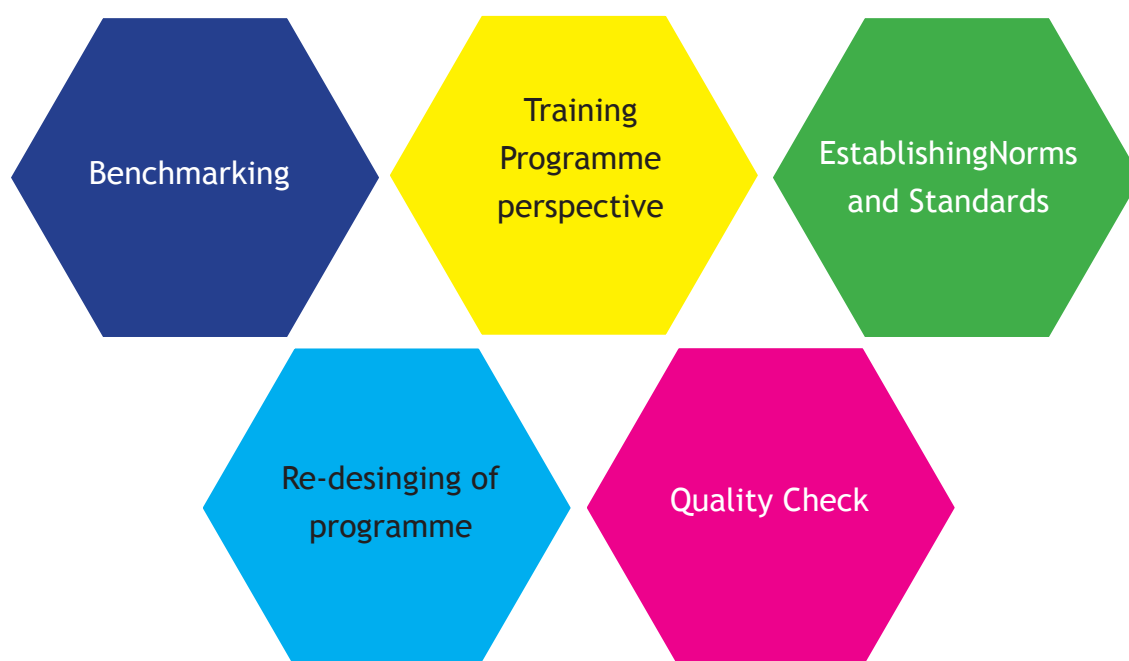
- i. Diagnosis of problems and errors in teaching-learning process
- ii. Grouping or divisioning of athletes as per ability or skill.
- iii. Prediction of performance of athletes
- iv. Self-assessment of teaching effectiveness





In addition to the student's perspective, another important dimension which needs to be discussed regarding importance of Tests, Measurement and Evaluation is from the Coach/ PE Teacher/ Trainer's perspective. Tests, measurement and evaluation have a lot of importance in helping them acquire adequate feedback about their pedagogy and student satisfaction, and identify areas for improvement. Without a reliable test, measurement and evaluation system, coaches may lack support of authentic feedback about their task and training methods. Tests can provide necessary feedback as these testing and evaluation processes help in diagnosing pedagogical issues and reasons to improve athletes' performance and satisfaction.

C. Importance of Test, Measurement and Evaluation from the Training Programme perspective



- i. Benchmarking of training programmes or comparison of training programme with desired objectives and outcomes of athletes.
- ii. Norms and Standards can be established for future objectives related to skill, fitness or other abilities.
- iii. Re-designing of programme based on previous test results.
- iv. Quality Check and control process of training system and athlete development programmes.

Along with the importance of tests, measurement and evaluation for athletes and coaches, it is also very important from the perspective of the training programme too. Training programmes in physical education and sports are dynamic in nature which need regular updates and modifications based on the need of training and



competition demands. The desired modification should be based on scientific processes, for which testing of training programmes, benchmarking with other existing training approaches, developing quality control process and evaluating with norms and standards are essential.

I. Tick the correct options.

1. The term 'placement' refers to
 - i. giving all students the same training programme
 - ii. placing students into categories based on their skills
 - iii. determining the strengths and weaknesses of individuals
 - iv. predicting a student's future success in a particular sport
2. Test and measurement scores are NOT helpful in
 - i. determining the strengths, weaknesses and limitations of a student
 - ii. discouraging the student from participating in a particular activity
 - iii. helping a student pick up the sports activity of his/her choice
 - iv. predicting the student's future level of achievement

II. Answer the following questions briefly.

1. What is the role of tests and measurement in Diagnosis?
2. What is role of tests and measurement in Placement?

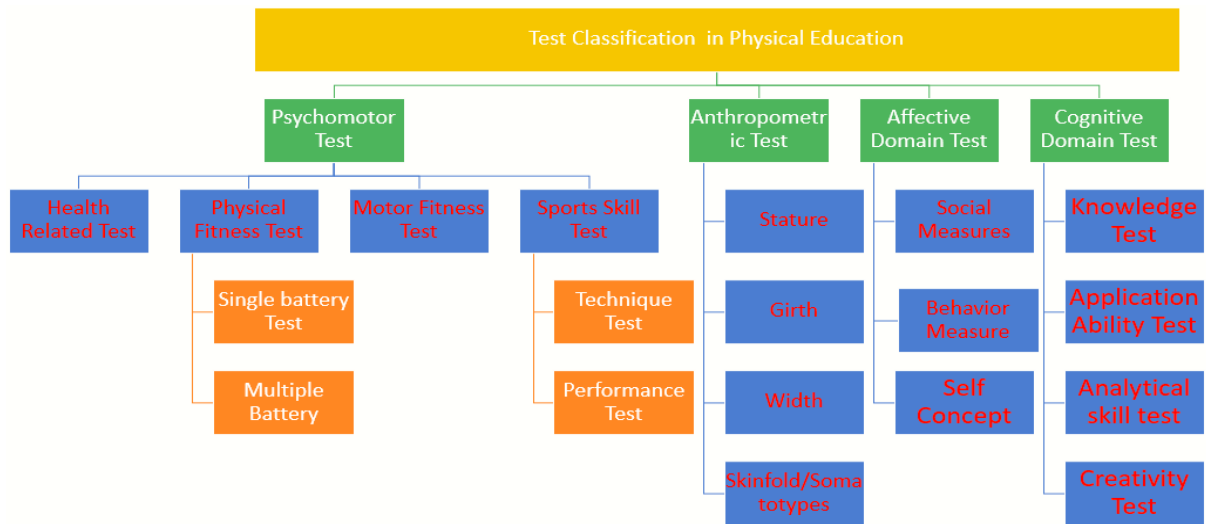
III. Answer the following questions in 150-200 words.

1. Distinguish between Test, Measurement and Evaluation. Highlight their importance in Sports.

6.3.1 Classification of Tests in Physical Education and Sports

In sports, exercise and physical activities there are various parameters of an athlete or a participant which need to be tested. As you know, the aim of different tests is to measure different types of traits and attributes. In sports and physical activities, skill and physical fitness tests alone do not perfectly classify, justify or validate the participants' ability and progress in performance. Other factors, such as anthropometric components, motivation and desire, concentration focus etc. could affect the ultimate performance. Therefore, a variety of tests need to be applied for sports skill and fitness level assessments. These tests are categorized according to their nature and purpose such as Psychomotor Test, Anthropometry test, Affective domain (emotional) test, Cognitive Domain test. These tests are helpful for a comprehensive assessment of an athlete or any participant in exercise and fitness program. Lets discuss the following classification of tests:





6.3.2 Psychomotor Tests

Psychomotor tests are to assess the participant's ability to perceive instructions and perform motor responses often including measurements related to movements. In these tests, participants are required to perform motor activities to their best ability and neuro-coordination. There is a vast range of tests in this category which can be classified in numerous ways. Here we are dividing these tests into the following categories: Health Related Fitness Tests, Physical Fitness Tests, Motor Fitness Tests and Sports Skill Tests.

- Health Related Physical fitness is defined as a set of attributes that people have or achieve that relates to the ability to perform physical activity and demonstrates indications of a healthy lifestyle. These tests are performed to measure physical characteristics of an individual. Health related physical fitness tests only measure those components which require physical presence without involving any effort or physical activity from the participants. These tests include assessment of health status through BMI and other somato-type methods along with basic physiological elements like heart rate, lung capacity etc. which are essential for leading a healthy lifestyle and can be achieved through participation in regular physical activity.
- Physical Fitness is defined as a set of attributes that people have or achieve that relate to the ability to perform physical activity of moderate to vigorous (MVP) level and reflect reserve energy to work during any emergency needs. It is also characterized by (1) an ability to perform daily activities with vigour, and (2) a demonstration of traits and capacities that are associated with a low risk of premature development of hypokinetic diseases (e.g., those associated with physical inactivity). Physical Fitness Tests are designed to assess these attributes.



- Motor Fitness is defined as a set of attributes that people have or achieve that relates to the ability to perform physical actions engaging neuromuscular coordination which are associated with sports. Motor fitness tests include the components of physical fitness, but in addition, also include coordination abilities like hand-eye coordination, movement coupling, balance, agility and other coordination abilities specific to particular sports or activity.
- Sports Skill Tests are designed to evaluate the ability of a participant to perform physical tasks associated or related to particular sports and its related skills. Every sports has its own sports skill tests that are designed scientifically and have standard norms to evaluate the performance of an athlete's skill sets.

6.3.3 Anthropometric tests

Anthropometric Testing is the science of assessing the human body's surface measurements, anthropometric evaluation of an athlete's body is very important in order to assess the fitness of body to a particular type of sports. Different sports require different body specifications (like height, weight, body build, body composition etc.) which provide an extra aid to the athletes possessing ideal body structure. The anthropometrical variables that account for athletes' performance includes stature (height), girth (circumference). width, somatotype, through measurement of body mass, height, push-ups, and biceps girth.

A. Body Measurements

1. Body Weight.
2. Stature/Height.
3. Waist-Hip Ratio
4. BMI (Height-Weight Ratio)

B. Skeletal Girth (Diameters)

1. Bi-acromial Diameter (Shoulder Width).
2. Bicristal Diameter (Abdominal Width).
3. Bitrochanteric Diameter (Hip Width).
4. Humerus Bicondylar Width (Elbow Width).
5. Wrist Diameter.
6. Femur Bicondylar Diameter (Knee Width).
7. Ankle Diameter.





C. Circumferences

1. Chest Circumference.
2. Upper-Arm Circumference.
3. Fore-Arm Circumference.
4. Thigh Circumference.
5. Calf Circumference.

6.3.4 Physical tests

These tests are performed to measure physical characteristics of an individual. Physical tests only measure physical presence without involving any effort of the subject. It measures size or components of body or body parts. It requires a tester and a subject to be tested. Examples of tests are measurement of height, weight, circumference, diameter, skinfolds, blood test, X-rays etc.

6.3.5 Affective domain tests

Affective domain tests refer to sociopsychological area that deals with human feelings and relationship behaviour of individuals. These tests are to measure behavior and emotions. In these tests subjects are required to perform mental activities with their best efforts by writing (pen-paper test) their responses, through interviews or projective methods. These tests deal with the techniques of measuring several aspects of affective domains which is important for an athlete's performance. Social Behaviour Tests, Personality tests, Tests that assess stress, emotional aspects etc. are part of Affective Domain Tests. These tests are standard tests constructed and designed scientifically by experts.

6.3.6 Cognitive domain tests

Cognitive domain is concerned with mental performance or achievement. Tests concerned with cognitive domain involve testing of knowledge and various other mental achievements of athletes like attention span, concentration, focus, intelligence, creativity. Educational institutes teaching subjects like maths, science, literature assess cognitive aspects of students, but with physical education and sports cognitive domain is challenging to assess, as least importance is given to this domain. However, it is very essential that this be evaluated for effective performance and progress. To evaluate athletes and sports participants effectively, a PE Teacher, coach or trainer must have a clear understanding of the cognitive aspects associated with a particular sport or physical activity. It will help the person administering the



test to select and administer appropriate cognitive tests and measurements that are relevant to the training outcome. The cognitive test score can be compared with appropriate standards, and finally, determine grades for scientific judgement on athletes' cognitive abilities.

I. Tick the correct options.

1. BMI is an example of which of the following:
 - i. Anthropometric Tests
 - ii. Physical Fitness Tests
 - iii. Psychomotor Tests
 - iv. Written Tests
2. Which type of test may be used to test social behaviour?
 - i. Anthropometric Tests
 - ii. Physical Fitness Tests
 - iii. Psychomotor Tests
 - iv. Affective domain Tests

II. Answer the following questions briefly.

1. Explain Psychomotor test with an example.
2. Demonstrate with examples the difference between Physical and Psychomotor test.

III. Answer the following questions in 150-200 words.

1. Discuss the classification of tests with suitable examples

6.4.1 Test Administration Guidelines in Physical Education and Sports

Administration of tests deals with the total organization, management, execution, supervision of tests along with proper follow-up function and adequate reporting and utilization of test results. Unsystematic, inefficient or inaccurate testing may be mainly due to ignorance of proper procedure of test administration. The person administering the test must prepare to avoid such situations in the process of test administration. The whole process may be divided into three parts:

- i. Pre- planning
- ii. Testing Operation
- iii. Post- Test Functions





Pre-Test Planning

1. Economy of Testing

- Test stations
- Test Personnel
- Grouping of Subject
 - Individual testing
 - Mass testing
 - Squad testing

2. Logistic Management plan

3. Data record plan

- . Score units
- . Score compilation process
- . Score sheet plan

Test Operations

1. Explanation
2. Demonstration
3. Warm-Up
4. Motivation
5. Safety/Security

Post-Test Functions

1. Test Record-collection & conversions.
2. Interpretation of Result
3. Preparation of report
4. Construction of Table/graphs

Pre- Planning

1. The test planning document must be prepared keeping in mind all stakeholders of the test.
2. Testing stations, score sheets/questionnaire, organization of group, test layout etc. must be prepared before the testing.
3. The information regarding testing purpose, scientific authenticity of test, group size, age, sex must be considered.
4. The test must be planned in such a way that it proves to be most economical in terms of cost of instrument/equipment, economy of time and number of personnel required.

Testing Operation

1. All the equipment and facilities to be carefully checked and placed in proper position before subject arrives.
2. All instructions, explanation, demonstration, layout plan illustration should be given to the subject well in advance.
3. Before administering a psychomotor test, a short warm-up is required to avoid injury and assure better performance.
4. Motivation strategies should be adopted for the subjects which help to perform best during the test.
5. The responsibility of the person administering the test and testing personnel is to ensure safety precautions during explanation and demonstration.



6. During testing period the person administering the test should cross check with all necessary points from the check list

Post-Test Functions

1. All answer sheets or score sheets must be compiled in a safe place and raw scores should be converted into standard scores or may be compared with norms.
2. Test scores must be interpreted as per standards and norms by applying appropriate statistics.
3. To illustrate the results, appropriate tables, graphs and profile may be prepared.
4. A report should be prepared after the event which indicates the nature, scope and objectives of the testing programme.

I. Tick the correct options.

1. Collection of score sheet is a_____ function.
 - i. Pre-test
 - ii. Testing
 - iii. Post-test
 - iv. None of Above
2. Testing of scientific authenticity of test is done in which phase?
 - i. Pre-test
 - ii. Testing
 - iii. Post-test
 - iv. None of Above

II. Answer the following questions briefly.

1. Write the guidelines of Testing operation phase.
2. Explain pre planning of test administration.

III. Answer the following questions in 150-200 words.

1. Discuss Test administration guidelines by giving suitable example

7.5.1 Body Mass Index (BMI)

Confusion surrounds the precise meaning of the terms overweight, overfat, and obese as applied to body weight and body composition. Each term often takes on a different meaning depending on the situation and context of use.





Medical literature infers the term overweight as being abnormal or excessive fat accumulation that presents a risk to health. While obesity refers to individuals at the extreme of the overweight continuum. The Body Mass Index (BMI) is the measure most often used for this distinction. The overweight condition refers to a body weight that exceeds some average for stature, and perhaps age, usually by some standard deviation unit or percentage. The overweight condition frequently accompanies an increase in body fat, but not always (e.g., male power athletes), and may or may not coincide with the comorbidities like glucose intolerance, insulin resistance, dyslipidaemia, and hypertension (e.g., physically fit overfat men and women).

When bodyfat measures are available (hydrostatic weighing, skinfolds, girths, bioelectrical Impedance Analysis [BIA], Dual energy X-ray Absorptiometry [DXA] it becomes possible to more accurately place body fat level on a continuum from ~~low to high, independent of body weight. Over fatness, then, would refer to a~~ condition where body fat exceeds an age- and/or gender-appropriate average by a predetermined amount. In most situations, "overfatness" represents the correct term when assessing individual and group body fat levels. The term obesity refers to the overfat condition that accompanies a constellation of comorbidities that include one or all of the following components of the "obese syndrome": glucose intolerance, type 2 diabetes, hypertension, increased risk of coronary heart disease and cancer.

Extension Activity

Record the height and weight of all students in your class.

- ◆ Find the BMI by applying formula.
- ◆ Find the Waist Hip Ratio using the given formula.

Clinicians and researchers frequently use the body mass index (BMI), derived from body mass and stature, to assess "normalcy" for body weight. This measure exhibits a somewhat higher, yet still moderate, association with body fat and disease risk than estimates based simply on stature and body mass.

BMI Computation

BMI computes as follows:

BMI = Body mass (kg) / stature (m²) Example

Male stature: 175.3 cm, 1.753 m ; body mass: 97.1 kg . BMI = 97.1 / (1.753)²

= 31.6 kg .m⁻², or simply 31.6

BMI	Classification
< 18.5	Under weight
18.5-24.9	normal weight
25.0-29.9	Overweight
30.0-34.9	class I obesity
35.0-39.9	class II obesity
≥ 40.0	class III obesity

7.5.2 Waist to Hip Ratio (WHR)

The waist to hip ratio determines the possibility of health risks and is an indication of whether you have an apple- or pear-shaped figure. The waist to hip ratio measurement is calculated by dividing the measurement of your waist by your hip measurement.

- **Aim:** the purpose of this test to determine the ratio of waist circumference to the hip circumference, as this has been shown to be related to the risk of coronary heart disease.
- **Equipment required:** tape measure
- **Procedure:** A simple calculation of the measurements of the waist girth divided by the hip girth.

Waist to Hip Ratio (WHR) = G_w / G_h , where G_w = waist girth, G_h = hip girth. It does not matter which units of measurement you use, as long as it is the same for each measure.

- **Scoring:** The table below gives general guidelines for acceptable levels for hip to waist ratio. Acceptable values are excellent and good. You can use any units for the measurements (e.g. cm or inches), as it is only the ratio that is important.
- **Target Population:** This measure is often used to determine the coronary artery disease risk factor associated with obesity.
- **Advantages:** the WHR is a simple measure that can be taken at home by anyone to monitor their own body composition levels.
- **Other Comments:** The basis of this measure as a coronary disease risk factor is the assumption that fat stored around the waist poses a greater risk to health than fat stored elsewhere in the body.

According to the World Health Organization (WHO), a healthy WHR is:

- 0.9 or less in men





- 0.85 or less for women giving from Tableno-1

e.g., A man who is 183 cm tall, and weighs 95 kgs.

Assessment: As per Table No 1, ideal weight should be in between 72.6 - 88.9 kg, hence he is overweight.

Table No. 1: Height and Weight Table

Adults Weight to Height Ratio Chart		
Height - Ft. In. (cms)	Female	Male
4' 6" - (137 cm)	63 - 77 lb - (28.5 - 34.9 kg)	63 - 77 lb - (28.5 - 34.9 kg)
4' 7" - (140 cm)	68 - 83 lb - (30.8 - 37.6 kg)	68 - 84 lb - (30.8 - 38.1 kg)
4' 8" - (142 cm)	72 - 88 lb - (32.6 - 39.9 kg)	74 - 90 lb - (33.5 - 40.8 kg)
4' 9" - (145 cm)	77 - 94 lb - (34.9 - 42.6 kg)	79 - 97 lb - (35.8 - 43.9 kg)
4' 10" - (147 cm)	81 - 99 lb - (36.4 - 44.9 kg)	85 - 103 lb - (38.5 - 46.7 kg)
4' 11" - (150 cm)	86 - 105 lb - (39 - 47.6 kg)	90 - 110 lb - (40.8 - 49.9 kg)
5' 0" - (152 cm)	90 - 110 lb - (40.8 - 49.9 kg)	95 - 117 lb - (43.1 - 53 kg)
5' 1" - (155 cm)	95 - 116 lb - (43.1 - 52.6 kg)	101 - 123 lb - (45.8 - 55.8 kg)
5' 2" - (157 cm)	99 - 121 lb - (44.9 - 54.9 kg)	106 - 130 lb - (48.1 - 58.9 kg)
5' 3" - (160 cm)	104 - 127 lb - (47.2 - 57.6 kg)	112 - 136 lb - (50.8 - 61.6 kg)
5' 4" - (163 cm)	108 - 132 lb - (49 - 59.9 kg)	117 - 143 lb - (53 - 64.8 kg)
5' 5" - (165 cm)	113 - 138 lb - (51.2 - 62.6 kg)	122 - 150 lb - (55.3 - 68 kg)
5' 6" - (168 cm)	117 - 143 lb - (53 - 64.8 kg)	128 - 156 lb - (58 - 70.7 kg)
5' 7" - (170 cm)	122 - 149 lb - (55.3 - 67.6 kg)	133 - 163 lb - (60.3 - 73.9 kg)
5' 8" - (173 cm)	126 - 154 lb - (57.1 - 69.8 kg)	139 - 169 lb - (63 - 76.6 kg)
5' 9" - (175 cm)	131 - 160 lb - (59.4 - 72.6 kg)	144 - 176 lb - (65.3 - 79.8 kg)
5' 10" - (178 cm)	135 - 165 lb - (61.2 - 74.8 kg)	149 - 183 lb - (67.6 - 83 kg)
5' 11" - (180 cm)	140 - 171 lb - (63.5 - 77.5 kg)	155 - 189 lb - (70.3 - 85.7 kg)
6' 0" - (183 cm)	144 - 176 lb - (65.3 - 79.8 kg)	160 - 196 lb - (72.6 - 88.9 kg)
6' 1" - (185 cm)	149 - 182 lb - (67.6 - 82.5 kg)	166 - 202 lb - (75.3 - 91.6 kg)
6' 2" - (188 cm)	153 - 187 lb - (69.4 - 84.8 kg)	171 - 209 lb - (77.5 - 94.8 kg)
6' 3" - (191 cm)	158 - 193 lb - (71.6 - 87.5 kg)	176 - 216 lb - (79.8 - 98 kg)
6' 4" - (193 cm)	162 - 198 lb - (73.5 - 89.8 kg)	182 - 222 lb - (82.5 - 100.6 kg)
6' 5" - (195 cm)	167 - 204 lb - (75.7 - 92.5 kg)	187 - 229 lb - (84.8 - 103.8 kg)
6' 6" - (198 cm)	171 - 209 lb - (77.5 - 94.8 kg)	193 - 235 lb - (87.5 - 106.5 kg)
6' 7" - (201 cm)	176 - 215 lb - (79.8 - 97.5 kg)	198 - 242 lb - (89.8 - 109.7 kg)
6' 8" - (203 cm)	180 - 220 lb - (81.6 - 99.8 kg)	203 - 249 lb - (92 - 112.9 kg)
6' 9" - (205 cm)	185 - 226 lb - (83.9 - 102.5 kg)	209 - 255 lb - (94.8 - 115.6 kg)
6' 10" - (208 cm)	189 - 231 lb - (85.7 - 104.8 kg)	214 - 262 lb - (97 - 118.8 kg)
6' 11" - (210 cm)	194 - 237 lb - (88 - 107.5 kg)	220 - 268 lb - (99.8 - 121.5 kg)
7' 0" - (213 cm)	198 - 242 lb - (89.8 - 109.7 kg)	225 - 275 lb - (102 - 124.7 kg)

In both men and women, a WHR of 1.0 or higher increases the risk for heart disease and other conditions that are linked to being overweight.

7.5.3 Skinfold measures (3-site)

A skinfold is constituted by a double layer of skin plus underlying fatty tissue (subcutaneous fat). For measuring a skinfold thickness, the skinfold is lifted with the help of thumb, forefinger and middle finger of the left hand and the two jaws of the skinfold calliper are applied about half a cm below the picked fold at usually the pre marked level.

Since, the fatty tissue is quite compressible, therefore, the skinfold is measured at a standard pressure of 10 gm/mm square. Standard skinfold callipers are supposed to exert a pressure of 10 gm per millimetre square on the skin fold. The reading of the skinfold is read approximately 2 seconds after releasing the full pressure on the jaws of the calliper.

Equipment : The equipment used for measuring all skinfold widths is a standard skinfold calliper. A number of callipers are in use. But the most reliable are Harpenden, Lange and Lafayette skinfold callipers.

I. Tick the correct options.

1. Skinfold technique is used to measure
 - i. weight
 - ii. fat percentage
 - iii. girth measurement
 - iv. over fatness
2. WHR is calculate by
 - i. multiplying waist by hip measurement
 - ii. adding hip by waist measurement
 - iii. dividing hip by waist measurement
 - iv. subtracting waist from hip measurement

II. Answer the following questions briefly.

1. What is BMI?
2. What is WHR?
3. What is Overweight and obesity?

III. Answer the following questions in 150-200 words.

1. Vilas, a male person whose weighs is 90 kg and his height is 1.7 m. Calculate his BMI. Also state the category in which he falls.



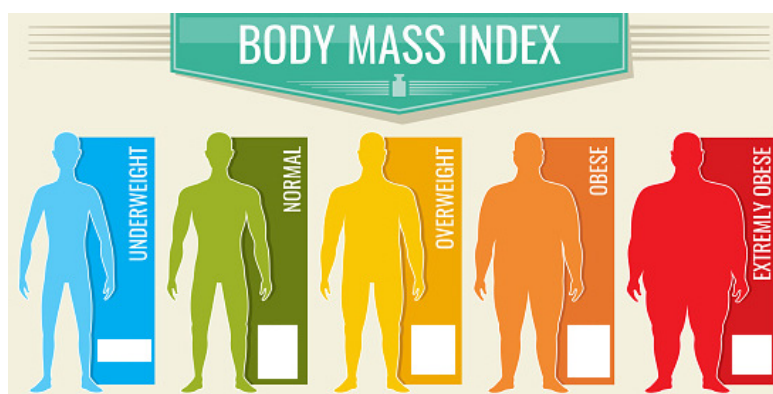


IV. Complete the diagram about some of the tests.

	Body Mass Index	Waist to Hip Ratio	Skinfold Measures
Purpose of test			
How the test is administered			

V. Case Study

BMI is considered a very useful test for body composition. People with high BMI are advised to workout and pay attention to their weight with the help of workout and improvement in their dietary habits. Based on this answer the following questions:-



- What is the range for Normal BMI?
- 30-34.5 is the range for _____.
- A person with BMI 26 is _____.
- Calculate BMI for a male whose weight is 90kg and his height is 1.7m.

VI. Art Integration

Design Posters for the Physical Education Testing area, giving instructions and illustrations for each test.

Suggested Reading:

- Clarke, H. D. (1987). Application of Measurement to Physical Education. Englewood Cliffs, Prentice Hall.
- Kansal, D. (2008). Text Book of Applied Measurement & Evaluation & Sports. New Delhi: Sports & Spiritual Science Publications.
- Morrow, J. R. (2000). Measurement and Evaluation in Human performance. Human Kinetics.

UNIT 7

FUNDAMENTALS OF ANATOMY AND PHYSIOLOGY IN SPORTS



Content

Definition and importance of Anatomy and Physiology in Exercise and Sports.

Functions of Skeletal System, Classification of Bones and Types of Joints.

Properties and Functions of Muscles.

Structure and Functions of Circulatory System and Heart.

Structure and Functions of Respiratory System.





Learning Outcomes

At the end of this unit, you will be able to:

- identify the importance of anatomy and physiology.
- recognize the functions of the skeleton.
- understand the functions of bones and identify various types of joints.
- figure out the properties and functions of muscles and understand how they work.
- understand the anatomy of the respiratory system and describe its working.
- identify and analyse the layout and functions of Circulatory System.



Quiz

- I. Tick the correct answers.
 1. Muscles are connected to bones by
 - a. ligaments
 - b. cartilage
 - c. tendons
 2. A flexor
 - a. decreases the angle at a joint
 - b. extends a limb
 - c. moves a limb towards the midline
 3. Shoulder and Hip Joints are an example of
 - a. ball and socket joint
 - b. hinge joint
 - c. saddle joint
 4. Histology refers to the study of the
 - a. cells of the body
 - b. history of anatomy
 - c. tissues of the body
 5. The membrane on the surface of a lung is called the
 - a. pleura
 - b. pericardium
 - c. mucosa

7.1.1 Definition of anatomy and physiology

Anatomy is a science that deals with the structure of the body and the relationship between the body parts. Or, Anatomy is scientific study of the structure of human body. Early physicians and scientists used to dissect the corpse to understand the relationship between various parts of the body. That's how we came with the word anatomy which is derived from the Greek words Ana which means apart and tomy meaning to cut. Hence, the word anatomy refers to dissection and it can be defined as the science of the structure of a body learned by dissection. In other words, anatomy is the study of the shape and structure of human body and body parts along with their relationship to one another.





Do you know?

Broad Categories of anatomy:

Gross anatomy/ Macroscopic anatomy: It deals with the large structures of the body which can be seen with naked eyes for example digestive system.

Microscopic Anatomy: It deals with the structure which only be seen with the help of microscope. For example, cells of human body.

7.1.2 Physiology

Physiology is scientific study of the functions of human beings. Or, Physiology is the study of responses of human body to the physical activity.

Physiology is derived from the Greek words physio which means nature and logio which means the study of. The detailed functioning of the body and its part and the responses of the body to a given stimulus are the topics that are covered in physiology.

It can further be understood by the example that when we walk, we can see how our body and its part work in a synchronized fashion or how our heart is continuously working to supply oxygen and others nutrients of our cells.

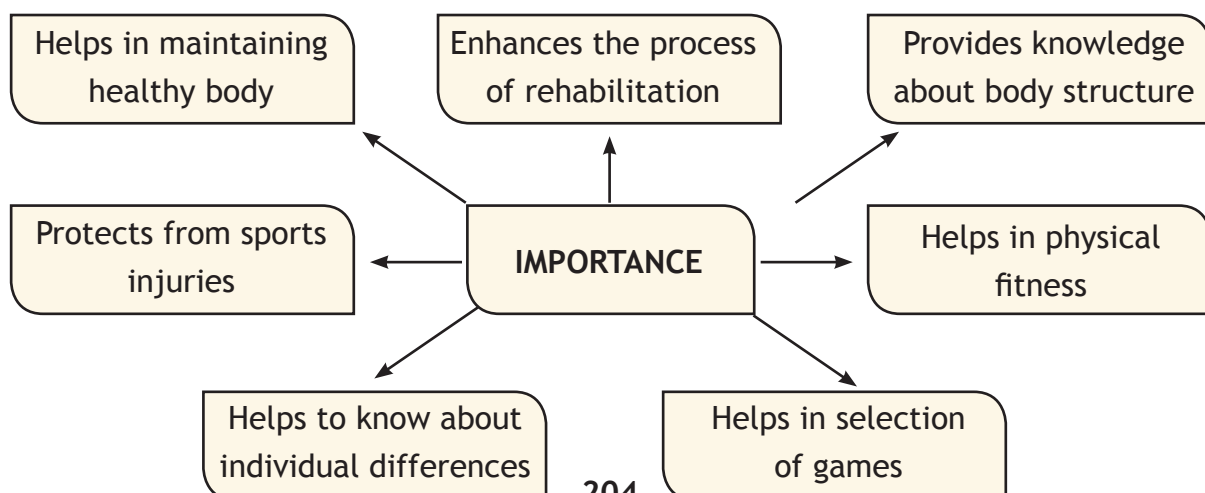
We can also say physiology is the detailed study of life, including the functioning of the smallest of cells, tissues, and other organisms.

Physiology is further divided into sub parts which are as follows:

Human physiology: This branch of physiology refers to the study of a specific organism, i.e., the human being.

Cellular and systemic physiology: Cellular physiology is the study of the function of cells while systemic physiology is the study of the function of the body's systems.

7.1.3 Importance of Anatomy and Physiology





1. **Helps in physical fitness:** Understanding the principles of anatomy and physiology can help a person learn about the body and its functioning which can further help a person to acquire a fit and healthy body. For example, building muscle strength, muscle endurance through appropriate exercises.
2. **Provides knowledge about body structure:** Every individual desires to have a fit body with strong muscles. With the help of anatomy and physiology we can assess our strengths and weaknesses and can work on improving our body. For example, designing an exercise routine based on the requirements and body structure of an individual.
3. **Provides knowledge about the functions of various organs of body:** Knowledge of anatomy and physiology equips us with important knowledge about our body and its systems which can help us train our body in a way that it functions at the optimal level and helps us to lead a healthy and active life. For example, knowledge of cardiovascular system can help us to understand the value of our heart and the importance of physical activity to keep it strong.
4. **Helps in selection of games:** Based on the knowledge of body structure, one can choose a game/sport. For example Basketball or volleyball is a good choice for a tall person and kho-kho is more appropriate for a person who has a short height.
5. **Protects from sports injuries:** Injuries related to sports such as sprain, contusion, fracture, dislocation of joints, etc., are common on the sports field. Sports equipment, based on knowledge of anatomy, is designed to ensure safety. Designing protective equipment in games and sports to provide protection to the soft and delicate organs requires appropriate knowledge about the functions of bones, muscles, tendons, and ligaments. For example, cricket leg pads or helmets are designed based on an understanding of the anatomy and physiology of a cricketer.
6. **Helps in the process of rehabilitation:** Many people suffer from injuries on the sports field, whether it is soft tissue injury or hard tissue injury and due to lack of knowledge of their body. It takes them a long time to recover from these injuries, and in many cases, people may not even recover fully. Anatomy and physiology help us to recover from injuries and attain the preinjury level. For example, suppose your friend twists his ankle while running, and you have a proper knowledge of the anatomy, can administer first aid, like applying ice on the ankle, before taking your friend to the doctor.
7. **Helps in maintaining healthy body:** By making some lifestyle changes and having knowledge about our body, we can attain an ideal weight and a healthy body. For example, knowledge of anatomy provides information about good and bad posture while sitting, standing, lying down, running.





8. **Helps to learn about individual differences between male and female athletes:** Understanding the basic physiological differences between the body of male and female sportspersons is essential because games and sports equipment is designed differently based on these differences. For example, the difference in the structure of shoulders among males and females is the reason for difference in the weights of sports equipment such as shotput, discus, hammer and javelin for males and females.

7.2.1 SKELETAL SYSTEM

The human skeletal system is the internal framework of the body which consists of bones, cartilages, joints, and ligaments. A human body has around 300 bones at the time of birth which decreases to 206 bones in a full-grown human as some bones get fused together.

What makes up the Skeleton

Skeleton system is an amalgamation of bones, joints, cartilages, tendons, and the ligaments

1. Bones are the rigid part of the skeleton. They provide support to the body and their different shapes help in different type of functions. For example, Metacarpals and phalanges helps your hand to form a fist.
2. Cartilage is more flexible than the bones. It gives shape and flexibility to the body to perform various kinds of movement. For example, it gives shape to our ears and nose, it also helps us to expand our chest while breathing.
3. Tendons and Ligaments are strong bands of fibrous connective tissues. Tendons connect muscles to bone, whereas ligaments connect one bone to another bone.

Do you know?

joint: a point where two or more bones are connected in the body in a manner that permits movement.

cartilage: a form of connective tissue that is semi-rigid yet flexible. It is found in the joints and other places such as the nose, throat, and ears.

tendon: a strong piece of tissue in the body connecting a muscle to a bone

ligament: fibrous cords that bind the bones together at joints

7.2.2 Functions of the SKELETAL SYSTEM

The human skeleton is divided into two functional parts:

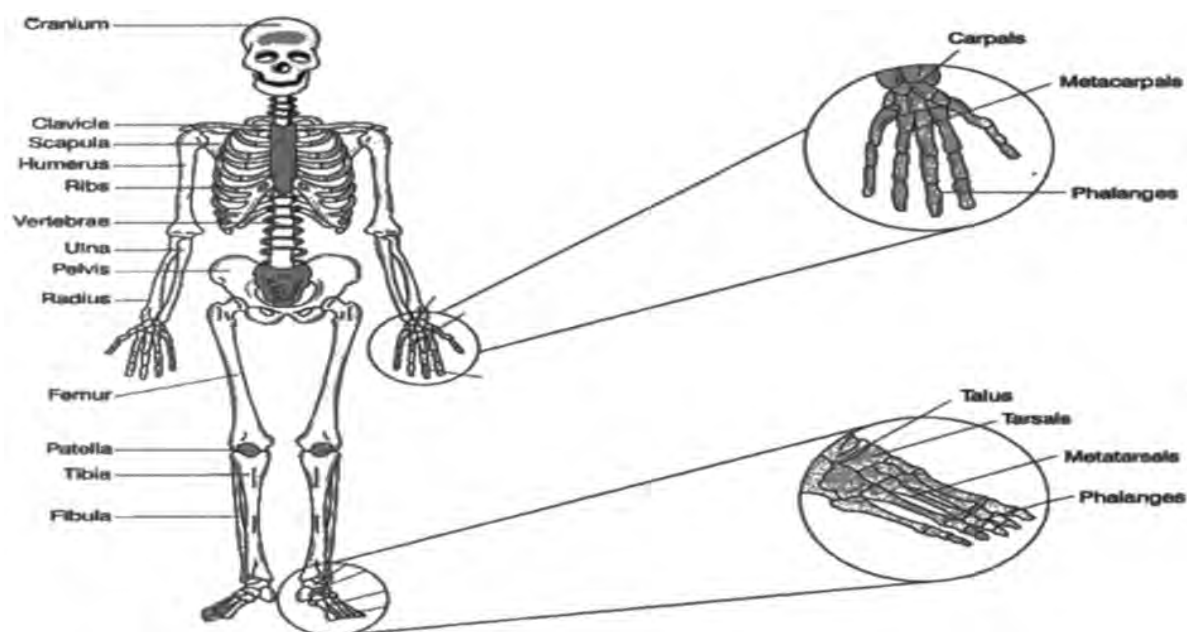
Axial skeleton - consists of the vertebral column, the rib cage, the skull, and the vertebra.

Appendicular skeleton - is attached to the axial skeleton. It is formed by the shoulder girdle, the pelvic girdle, and the bones of the upper and lower limbs.

Functions of the Skeleton

The functions of the skeleton include the following.

1. This skeletal system provides shape and support to the body.
2. It allows the body to create movement by forming the framework of the body, to which the muscles are attached. The movement of the body happens due to the contraction and relaxation of the muscles.
3. Skeletal system provides protection to the soft internal organs. For example, our ribcage protects our heart and lungs, same way our skull protects our brain.
4. The hard substance of the bones also serves as a store house of minerals.
5. Blood cells are also formed within the cavitation of the skeleton which is known as haemopoiesis.



Extension Activity

Working in groups of five draw and label the bones of the following parts:

1. Skull
2. Clavicle
3. The kneecap
4. Bones of the fingers and of the palm
5. Bones of the toes and of the feet.



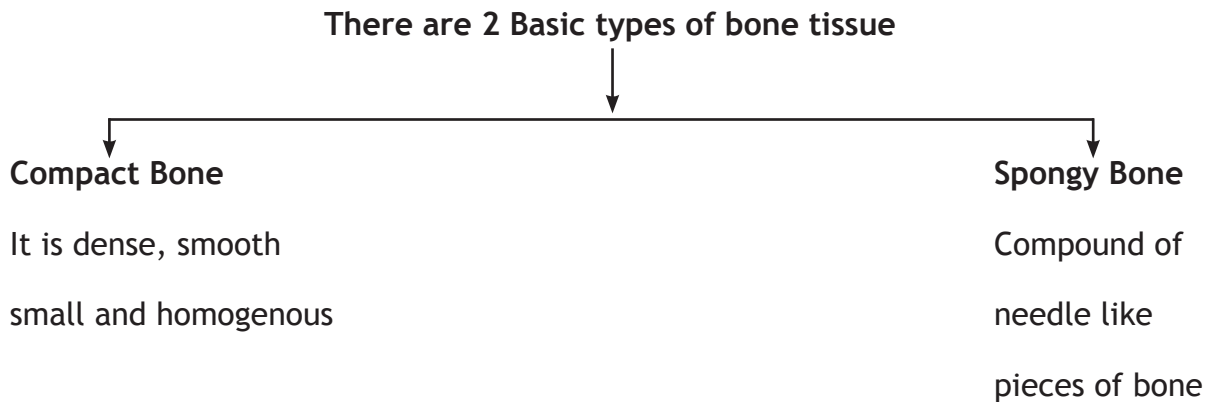


7.2.3 CLASSIFICATION OF BONES

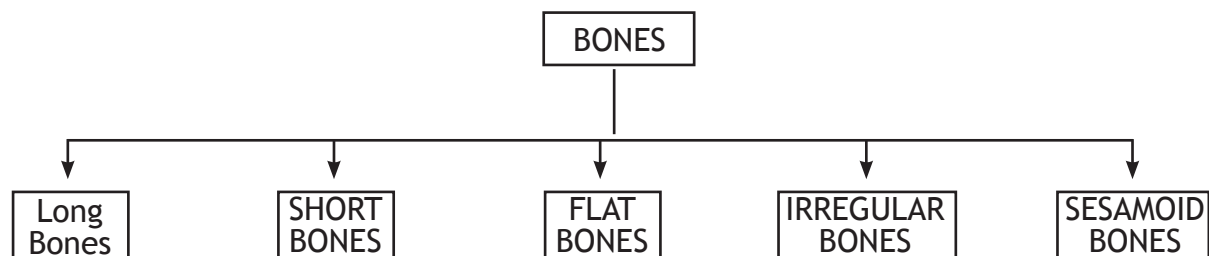
Bones can be classified based on different categories:

- Classification is based on bone tissue.
- Classification is based on shape and size.

Classification based on bone tissue.



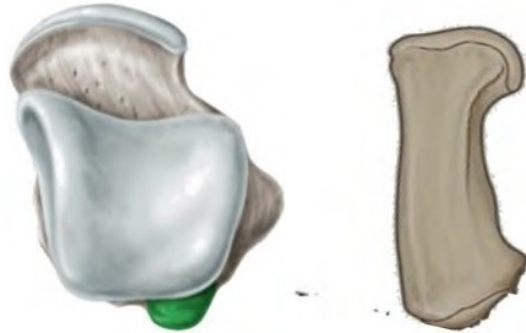
Classification of bones based on shape and size.



1. **Long Bones:** Long bones are hard, dense bones that provide strength, structure, and mobility to the body. They are named for their shape bone and not their size. These bones are cylindrical in shape and they have more length than width. The long bone is covered with a fibre sheet except where it joins with another bone. Where the long bone joins with other bone it is covered with a thin sheet of cartilage. Examples of long bones are: upper and lower arm (Humerus, Radius and Ulna), thigh and leg (Femur, Tibia and Fibula), metacarpals and phalanges in toe and fingers. Long bones contain both yellow bone marrow and red bone marrow, which produce blood cells.



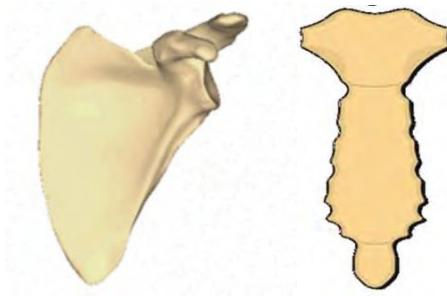
2. **Short Bones:** Short bones have a cube like shape with equal length, width and thickness. A short bone is composed of central spongy bone which is covered with a thin layer of compact bone. The motion of short bones is limited, and they glide on one another. The carpals in the wrist and the tarsals in the ankles are examples of short bones.



Capital (carpal) Bone

Talus

3. **Flat Bones:** Flat bones are thin and usually curved. They are composed of a central layer of spongy bone between two outer layers of compact bone. They form a bony cage and help in the protection of soft internal organs. Flat bones are found in cranial bones, ribs, sternum, scapula, and hipbone.



Scapula

Sternum

4. **Irregular Bones:** Irregular bones vary in shape and structure and therefore do not fit into any other category (flat, short, or long). They often have a complex shape, which helps protect internal organs. e.g., the vertebrae. Irregular bones of the vertebral column, protect the spinal cord. Some bones of the skull are also irregular bones.



Vertebra





5. Sesamoid bones

- Small and round bones embedded in the tendons. Its shape looks like a sesame seed.
- Its number varies from person to person.
- There is only one type of sesamoid bone known as patellae.

Extension Activity

Working in groups of five draw and complete the following table:

Bone	Type	Where it is found in the body
Radius		
Patella		
Metatarsal		
Femur		

Do You Know?

The shortest Bone in the human body is the STAPES found in the middle ear.

7.2.4 JOINTS

A joint or articulation (articular surface) is the point where the two or more bones meet and muscles act on them to cause movement.

Though a joint is usually considered movable, but it's not necessary in all the cases. There are many joints which show limited movement and some that are completely immovable.

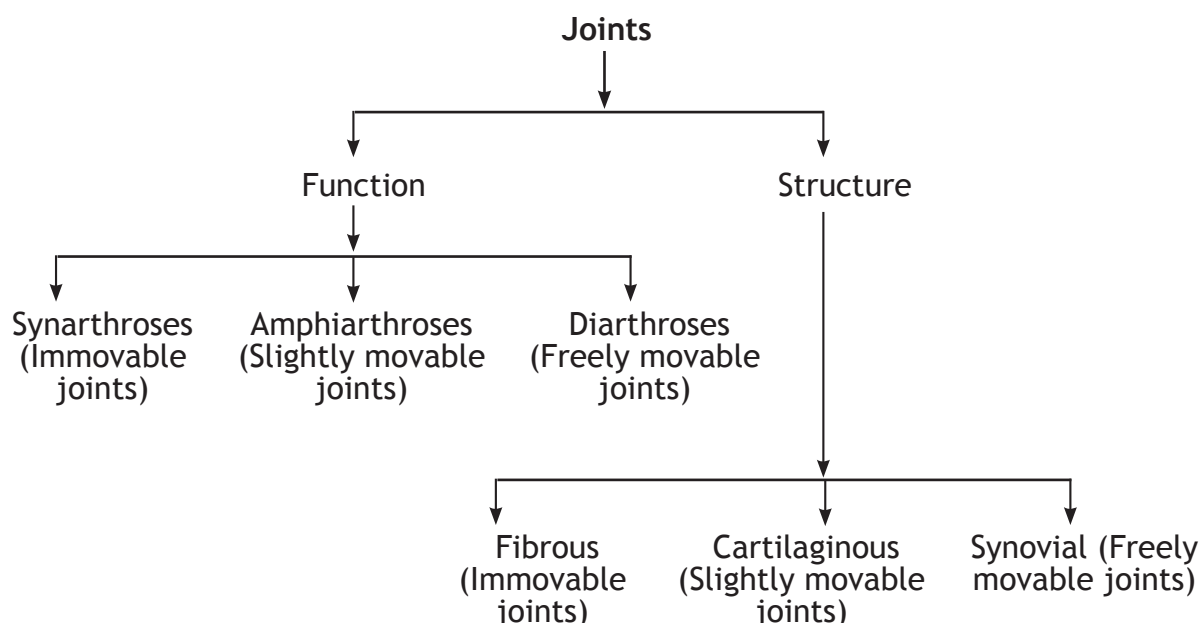
Joints are further classified on the basis of their functions and structure.

Extension Activity

Working in pairs, locate the joints in your

- Shoulder
- Arms
- Wrist
- Fingers
- Hip
- Legs
- Toes

Can you identify the movement in these joints?



The functional classification of joints focuses on the amount of movement permitted by the joint. Based on this:

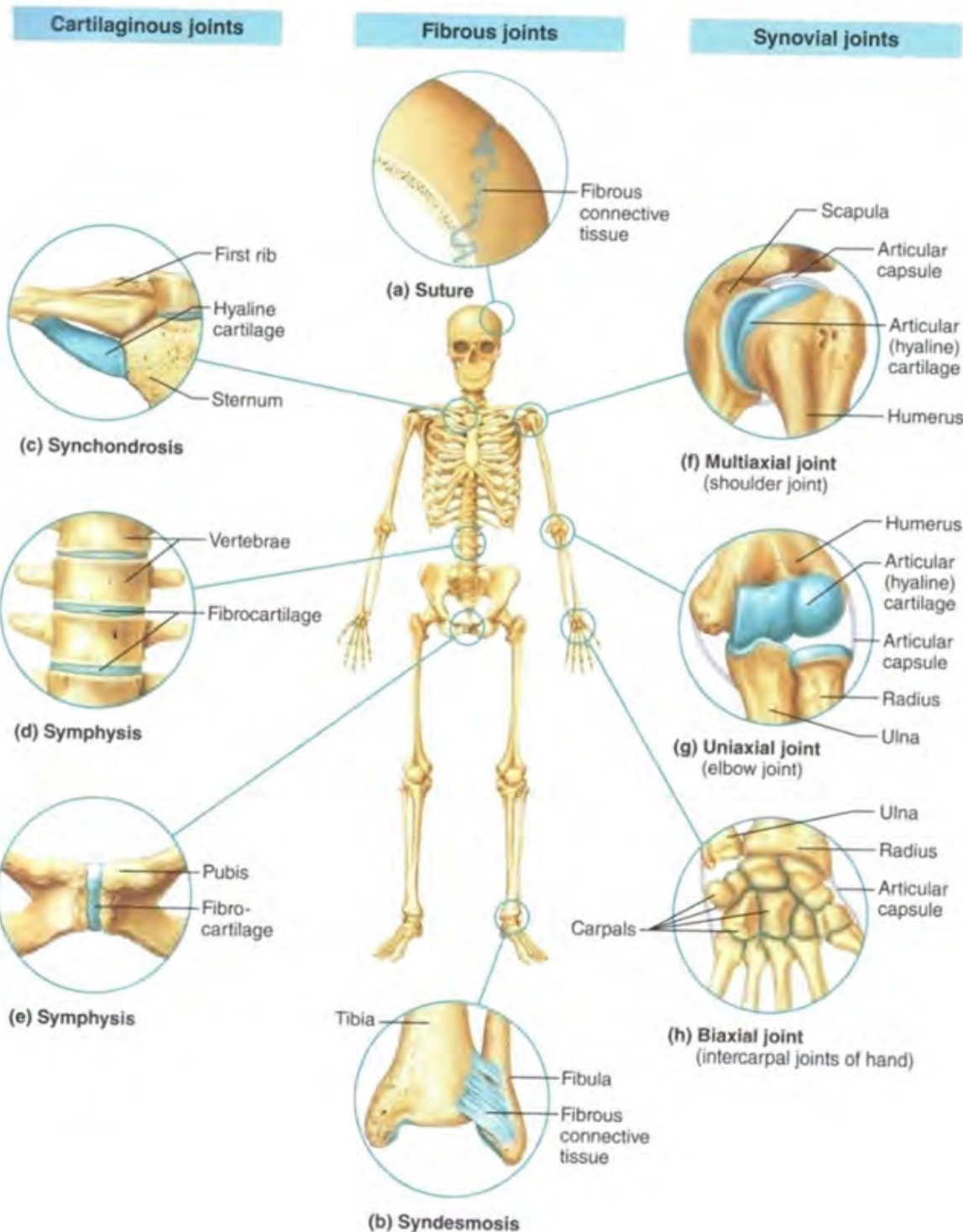
- Synarthroses or they may be called immovable joints
- Amphiarthroses which are also known as slightly movable joints
- Diarthroses or the freely movable joints.

The freely movable joints are majorly found in the limbs, where movement and mobility are of utmost importance. The immovable or slightly movable joints are mostly found in the axial skeleton where the priority is protection of internal organs and firm attachments.

In the structural classification mainly there are fibrous, cartilaginous, and synovial joints. This type of classification is based on whether fibrous tissue, cartilage, or a joint cavity separates the bony regions at the joint.

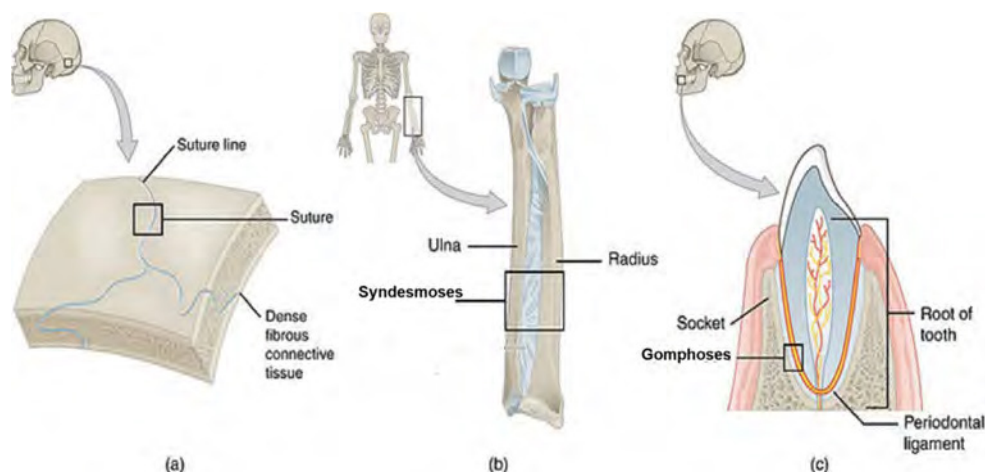
Fibrous joints are generally immovable and, synovial joints are freely movable joints. Cartilaginous joints have a combination of both immovable and slightly movable joints.



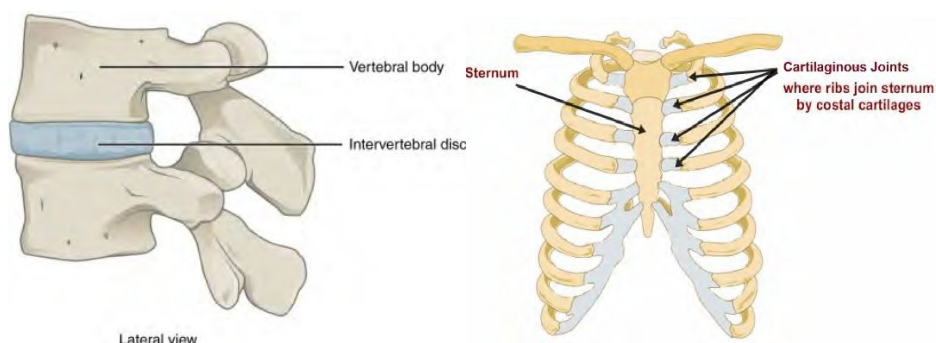


1. **Fibrous Joints** - In this type of joint, the bones are united together by fibrous tissue and show little or no movement. They are again further classified based on structure of the sutures, syndesmoses and gomphoses.
 - i. **Sutures** - A suture is a type of fibrous joint forming a tight union between the bones that prevents any movement between them. Sutures are only found between the bones of the skull or the cranium. The skull bones of a foetus are unfused but after birth, the bones slowly begin to fuse to become fixed, making the skull bones immovable to protect the brain from impact.

- ii. **Syndesmoses** - Syndesmosis is a fibrous joint in which the bones are separated by some distance and united together with the help of ligaments. e.g., fibrous membrane connecting maximum distal parts of the radius and ulna. Due to the lack of flexibility in these joint structures, ligament injuries in syndesmoses joints are common, particularly at the wrist and ankle.
- iii. **Gomphoses**- Agomphosis mostly consists of a peg attached into a socket and held by ligaments. The best example of this is the joint between a tooth and its socket.



2. **Cartilaginous Joints** - This type of joint unites two bones by the help of a cartilage. Very slight movement can occur at these joints. Another characteristic of this type of joint is that the articulating bone surfaces are connected by pads (discs) of fibrocartilage. For example, cartilage of the growing long bones and the cartilage between the ribs and the sternum.



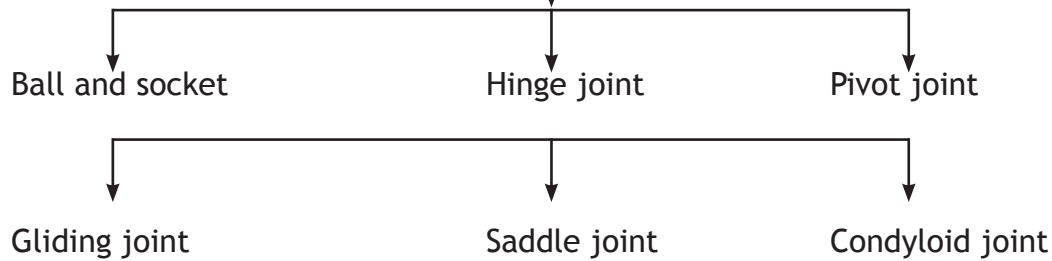
3. **Synovial Joints** - These are freely movable joints. These joints contain synovial fluid. They are mostly found in the limbs.

- All synovial joints consist of four distinguishing features.
- Articular cartilage
- Articular capsule
- Joint cavity
- Reinforcing ligament





Synovial Joints



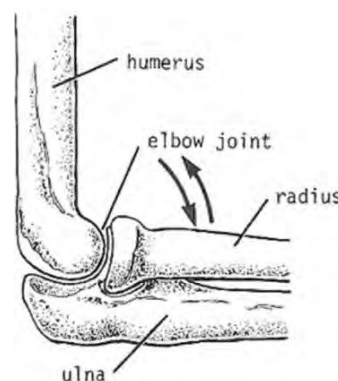
Types of synovial joints:

Synovial joints are classified according to the shape of the articulating surface. As you know, they can further be subdivided into the following categories.

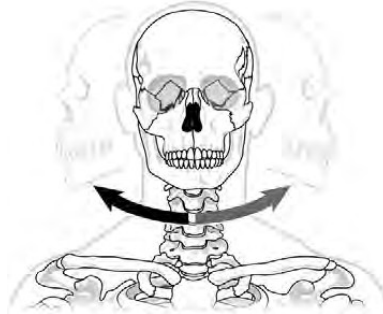
- i. **Ball and socket joint:** The ball and socket joint is a type of synovial joint. It is formed when the ball-shaped head of one bone fits into the cup-like socket or depression of another bone. The ball and socket joint allows the greatest range of movement. These multiaxial joints permit movement in all axes including rotation. e.g., hip joint and shoulder joint. This joint allows movement like an overhead clear in badminton or bowling in cricket.



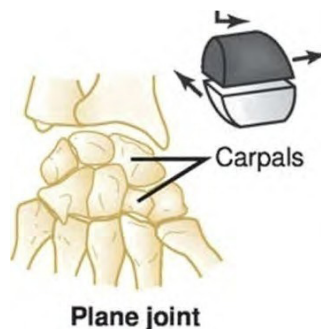
- ii. **Hinge joint:** The cylindrical end of one bone fits into a rough shaped surface of another bone. It allows a back-and-forth movement like a hinge in the door. The bones are restricted to do an angular movement. For example, movement of elbow and knee is the example of hinge joint. The extension and flexion movement are essential for building biceps, triceps and quadricep muscles.



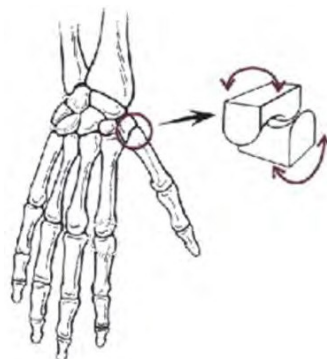
- iii. **Pivot joint:** Pivot joint, also called rotary joint, is a freely moveable joint that allows only rotary movement around a single axis. The moving bone rotates within a ring that is formed by a second bone and adjoining ligament. For example, the joint between the first and the second cervical vertebrae which allows the turning of the head from side to side.



- iv. **Plane or Gliding joint:** A gliding joint, also known as a plane joint, is a type of synovial joint that is formed between bones that meet at flat or nearly flat articular surfaces. Gliding joints allow the bones to glide past on one another in any direction along the plane of the joint – up and down, left and right, and diagonally. The movement in this joint is nonaxial which indicates that gliding does not allow rotation around any axis. For example, inter carpals or joints of the wrist.



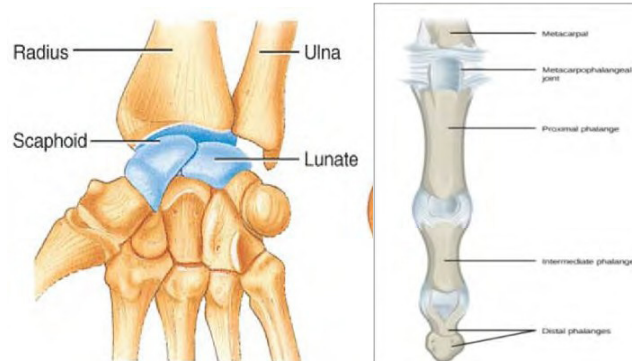
- v. **Saddle joint:** In the saddle joint, the articulating surface is shaped like a saddle, having both convex and concave areas. The bones in a saddle joint can rock back and forth and from side to side, but they have limited rotation. These biaxial joint allow very limited movement like the condyloid joints. For example, thumb joint.





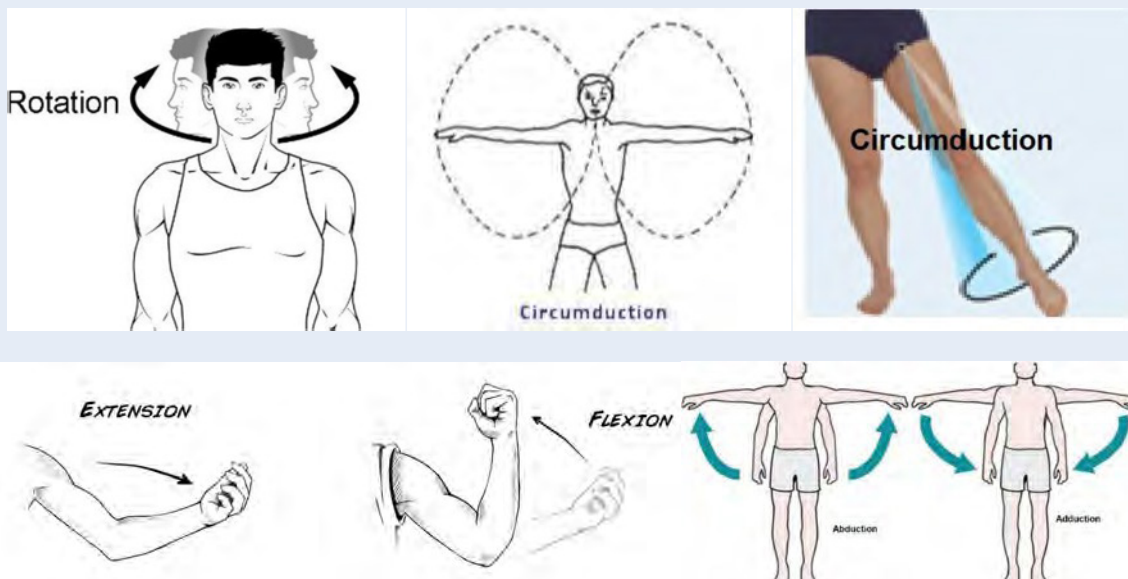
Example of a saddle joint used in sport is in a thumb war. The thumb moves side to side and back and forth for a thumb war.

- vi. **Condyloid joint:** Condyloid joints are a type of synovial joint where the egg-shaped articular surface of one bone fits into an oval cavity in another. This joint allows the moving bone to travel from side to side, back and forth but it does not allow it to rotate. Movement occurs only around two axes so they may be also called biaxial. For example, wrist joint, metacarpal, phalangeal joint. This joint is useful when players use their wrist for dribbling the ball in basketball.



Extension Activity

Practice the following movements. Can you identify the joint used?



I. Tick the correct option.

1. The short bones are generally
 - i. flat
 - ii. cube-shaped
 - iii. curved
 - iv. thin



2. One of the functions of the skeletal system includes haematopoiesis which refers to
 - i. provision of support to the body
 - ii. formation of blood cells
 - iii. production of minerals
 - iv. protection of delicate organs
3. A child has_____bones.
 - i. 206
 - ii. 213
 - iii. 270
 - iv. 300
4. Bones serves as a store house for
 - i. potassium
 - ii. phosphorus
 - iii. calcium
 - iv. nitrogen
5. According to the functional classification of joint which focuses on the amount of the movement of the joint, synarthroses are also known as:
 - i. immovable joints
 - ii. slightly movable joints
 - iii. freely movable joints
 - iv. combination of immovable and slightly movable joints
6. The sutures of the skull are the best examples of:
 - i. cartilaginous joints
 - ii. synovial joints
 - iii. fibrous joints
 - iv. freely movable joints
7. The synovial joints in which angular movement is allowed in just one plane is called
 - i. hinge joint
 - ii. saddle joint
 - iii. plane joint
 - iv. pivot joint





II. Answer the following questions briefly.

1. Name the longest and the shortest bones in the body.
2. List at least two functions of the skeletal system.
3. Name the four main classification of bones.
4. What are the two basic classifications of a joint?
5. What is the major difference between a fibrous joint and a cartilaginous joint?
6. Name two ball and socket joints of the body.

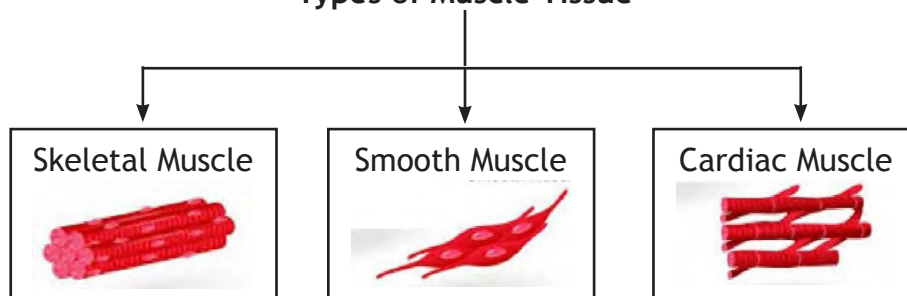
III. Answer the following questions in 150-200 words.

1. Elaborate the functions of the skeletal system.
2. Describe the types of bones found in the human body and discuss their functions.
3. Write about the types of synovial joints in details with suitable examples

7.3.1 PROPERTIES AND FUNCTIONS OF MUSCLES

Muscles in our body are responsible for all movement as the movement in our body is either done by the relaxation or the contraction of muscles. The movement of the muscles can be voluntary or involuntary. The pumping of blood by heart is an example of involuntary movement and running or walking is an example of voluntary movement.

Types of Muscle Tissue

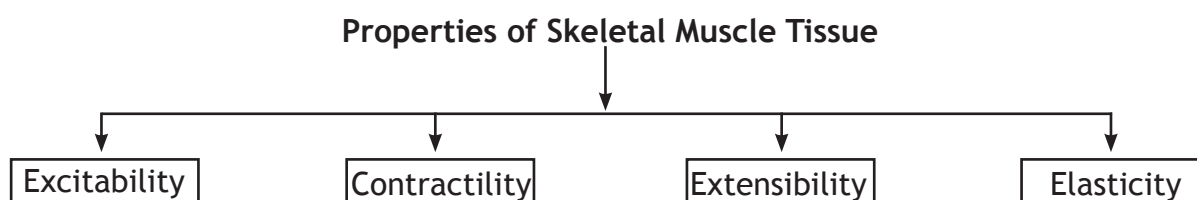


1. **Skeletal Muscles-** Skeletal muscles comprise 40% of the body weight. These muscles are attached to the skeletal system with the help of tendons. These muscles have the ability to exert force. They are also called striated muscles as their striations can be seen when observed under the microscope. These muscles are voluntary in nature which means we can control them at will. For example, walking, running, smiling, eating etc. These muscles can contract most rapidly but not for a long periods, as that results in tiring of the muscle.

2. **Smooth Muscles-** Smooth muscles have elongated, slender, spindle shaped cells. These muscles do not have striations. They are also called involuntary muscles as their expansion or contraction is not under our control. These muscles contract much more slowly as compared to skeletal muscles and cardiac muscles. They are found mostly in hollow organs such as stomach, urinary bladder, and respiratory passages. Smooth muscles are also present in the eyes, where their function is to change the size of the iris and alter the shape of the lens; and in the skin where they cause hair to stand erect in response to cold temperature or fear.
3. **Cardiac Muscles-** Cardiac muscles are found only in the heart where they form the walls of the heart. They are long and striated but not as clearly striated as skeletal muscles. The rate of contraction of cardiac muscles is intermediated between smooth and skeletal muscles. Cardiac muscles are involuntary in nature.

8.3.2 PROPERTIES OF SKELETAL MUSCLES

Skeletal muscles have four major functional properties:



Excitability is the ability to respond to a stimulus, which may be delivered from a motor neuron or a hormone.

Contractility is the ability of muscle cells to forcefully shorten themselves, or the ability for self-contraction.

Extensibility is the ability of a muscle to stretch or the capacity to lengthen themselves.

Elasticity is the ability to recoil or bounce back to the muscle's original length after being stretched.

8.3.3 FUNCTIONS OF MUSCLES

1. **Movement:** Muscles give strength to the body which helps in contraction and relaxation of the muscle for any kind of movement. Movement can be largely divided into two categories: gross movement like walking or fine movement like writing.





2. **Maintenance of posture:** Muscles help us to maintain our body posture whether it is a sitting posture or a walking posture. Good and strong muscles help us to have a good posture and weak muscles don't have the strength to hold a good posture.
3. **Heat generation:** Our muscles help us to maintain the body temperature. Whenever the body heat falls, skeletal muscles start contractions to bring it to normal. For example, when we shiver the body's mechanism brings our temperature to normal.
4. **Respiration:** Our lungs have a muscle called diaphragm where exchange of gases takes place. When it contracts our chest cavity gets bigger and fills with air and then our diaphragm muscles relax our chest cavity pushes the air out.
5. **Constriction of organs and blood vessels:** Nutrients move through our digestive tract, urine is passed out of the body, and secretions are propelled out of glands by contraction of smooth muscles.
6. **Pumping blood:** Our heart pumps the blood and the smooth muscles in our veins and arteries bring the blood to heart from the cells and vice versa.

Do You Know?

The gluteus maximus is the largest muscle in the human body as it has the job of keeping the trunk of the body in an erect posture.

I. Tick the correct answer.

1. How many types of muscle tissue are there?
 - i. 1
 - ii. 2
 - iii. 3
 - iv. 4
2. Locomotion and facial expression are one of the important responsibilities of
 - i. Cardiac muscles
 - ii. Skeletal muscle
 - iii. Smooth muscle
 - iv. cardiac and skeletal muscles

3. The ability of a muscle to shorten forcefully is known as
 - i. extensibility
 - ii. contractility
 - iii. elasticity
 - iv. excitability

II. Answer the following questions briefly.

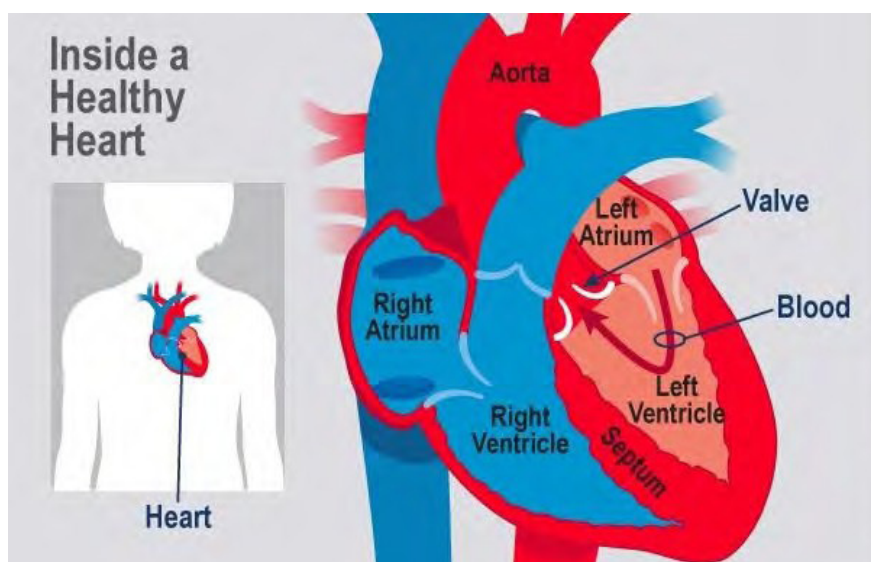
1. What is a muscle? List the major types of muscles.
2. Enlist the four major functional characteristics of the skeletal muscles.
3. Write down the properties of cardiac muscles.
4. How are smooth muscles different from cardiac muscles?
5. Where are smooth muscles found?
6. How do cardiac muscles differ from skeletal muscles?

III. Answer the following questions in 150-200 words.

1. What do you understand by the muscular system? Explain the structural classification of muscles.
2. Write down the functions of muscles in detail.

8.4.1 STRUCTURE AND FUNCTIONS OF THE CIRCULATORY SYSTEM AND HEART

The circulatory system is responsible for the transportation of the gases i.e., oxygenated blood from heart to the body cells and deoxygenated blood back to the heart, and then deoxygenated blood from heart to lungs and oxygenated blood back to the heart with the help of arteries and veins.





The Circulatory system consists of.

1. **Heart:** It is divided into four parts i.e., two pumping chambers known as ventricles and two receiving chambers known as atria. The two sides of heart is separated by a thick muscular wall called the septum.
2. **Blood vessels:** Blood vessels include veins, arteries, and capillaries. Veins brings deoxygenated blood from the cells to the heart. Arteries take the oxygenated blood from heart to the cells. Capillaries are the thin blood vessels where exchange of nutrients and oxygen takes place.
3. **Blood:** Blood is the bodily fluid which carries all the nutrients and oxygen which have to be transported throughout the body. It consists of red blood cells, white blood cells, plasma and platelets. Blood has red colour because of a red pigment called as Haemoglobin present in it.

There are two parts of circulatory system:

1. **Pulmonary circulation:** In the pulmonary circulation the heart pumps deoxygenated blood from its first pumping chamber i.e., left ventricle through pulmonary artery towards the lungs. The blood flows by touching the diaphragm of the lungs where exchange of gases takes place. After the exchange, the oxygenated blood comes back to the heart in its first receiving chamber i.e., right atrium through pulmonary veins. In the entire body there is only one artery which carry deoxygenated blood – the pulmonary artery and there is only one vein that carries oxygenated blood – the pulmonary vein, and they both are the part of pulmonary circulation.
2. **Systematic circulation:** Once the right atrium receives the oxygenated blood, it sends it to the heart's second pumping chamber i.e., the right ventricle and from their it is pumped to the entire body through aorta which is the body's biggest artery, it looks like a tree supplying water to every branch. At each body part there is a network of thin blood vessels known as capillaries which connect arteries and veins. Capillaries have a very thin layer which helps in exchange of gases and other nutrients. The waste product and deoxygenated blood goes to smaller veins, and then to bigger veins and finally reaches back to the heart. From the heart, blood is pumped into the lungs where it is re-oxygenated and returned to the heart. where it is received by the heart in its second receiving chamber i.e., leftt atrium. And then the cycle is completed. Both the circulations happen simultaneously and the heart controls the whole movement depending upon the requirements of the body. For example, you may have experienced when you run fast your heart beats very fast. That is because your heart is trying to meet the oxygen requirement of your body.
3. **Coronary circulation:** The heart works tirelessly from the day we are born till we die. It also needs oxygen to carry out its function. There are coronary arteries that transport the oxygenated blood to the heart and coronary veins takes the deoxygenated blood back to the right atrium.



THE HEART:

The heart is a cardiac muscle which does an alternating movement of contraction and relaxation. When the heart contracts, the term used is systole and when the heart relaxes, the movement is known as diastole. Systole is that movement when the ventricles pump the blood out of the heart and the atrium is ready for the movement of diastole. Whenever blood overflows in the atrium it gives an electronic signal to the brain and the ventricles pump the blood outside the heart and atrium pumps the blood into the ventricles. The amount of blood pumped out of the ventricle in each contraction is known as stroke volume and the amount of blood pumped out in one minute is known as the cardiac output.

Do you know?

Arteries - blood vessels that carry oxygenated blood from the heart.

Arterioles - a small branch of an artery leading into capillaries.

Capillaries - any of the fine branching blood vessels that form a network between the arterioles and venules.

Venules - a very small branch of a vein, especially one collecting blood from the capillaries.

Veins - blood vessels that carry deoxygenated blood back to the heart

7.5.1 STRUCTURE AND FUNCTIONS OF THE RESPIRATORY SYSTEM

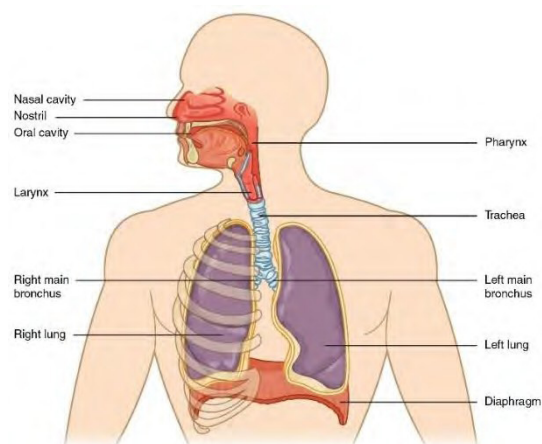
Respiration is made up of two phases called inspiration and expiration: You inhale (breathe in) oxygen during inspiration. You exhale (breathe out) carbon dioxide during expiration. Respiration includes the following processes

- Ventilation, the movement of air into and out of the lungs
- Gas exchange between the air in the lungs and blood, sometimes called external respiration
- Transport of oxygen and carbon dioxide in the blood.
- Gas exchange between the blood and the tissues, sometimes called internal inspiration.

Structure of Respiratory System:

The respiratory system consists of

- The nose
- The nasal cavity
- The pharynx



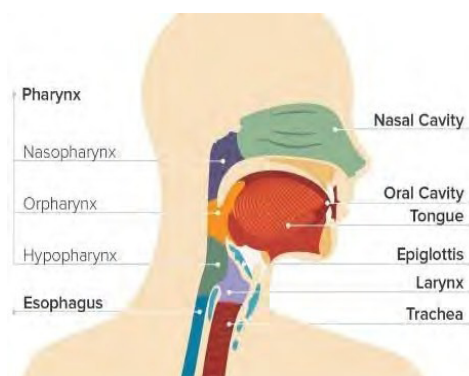


- The larynx
- The trachea
- Bronchi
- The lungs
- Bronchioles
- Alveoli
- Diaphragm

The Nose: The term nose usually refers to the visible structure that forms a prominent feature of the face and refers to the internal nasal cavity.

The Nasal Cavity: It extends from the external opening in the nose to the pharynx, and it is divided by the nasal septum into right and left side.

Pharynx: The pharynx is the common passageway of both the digestive and respiratory systems.



The pharynx can be divided into three regions

The nasopharynx: It is the superior part of pharynx and extends from the internal nares of nasal cavity to the level of uvula.

The oropharynx: The oropharynx is a passageway for both air and food. It extends from the uvula to the epiglottis. The oropharynx is bordered superiorly by the nasopharynx and anteriorly by the oral cavity.

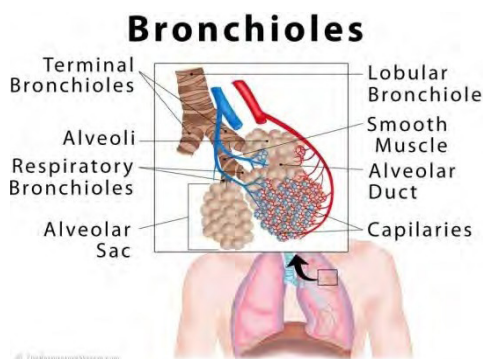
The laryngopharynx: The laryngopharynx extends from the epiglottis to the lower margin of the larynx. It continues the route for ingested material and air until its inferior end, where the digestive and respiratory systems diverge.

Larynx: The larynx consists of an outer casing of nine cartilages that are connected to each other by muscles and ligaments. It is also known as Voice box.

Trachea: The trachea, also known as the windpipe, is a membranous tube that consists of connective tissues and smooth muscles.

Bronchi: The trachea divides into the left and right primary bronchi. The main function of the bronchi, like other conducting zone structures, is to provide a passageway for air to move into and out of each lung. In addition, the mucous membrane traps debris and pathogens.

Bronchioles: Bronchioles, which are about 1 mm in diameter, further branch until they become the tiny terminal bronchioles, which lead to the structures of gas exchange. There are more than 1000 terminal bronchioles in each lung.



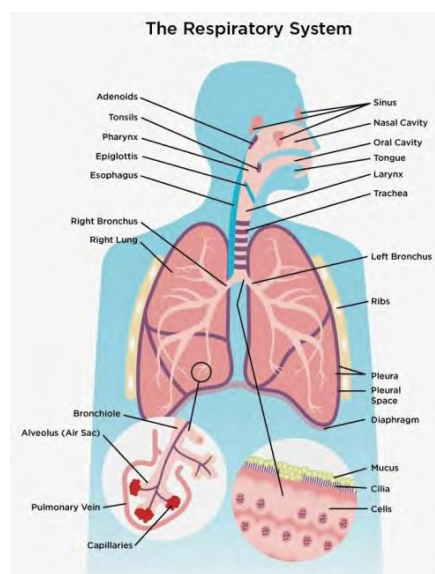
The muscular walls of the bronchioles do not contain cartilage like those of the bronchi. This muscular wall can change the size of the tubing to increase or decrease airflow through the tube.

Alveoli: An alveolar duct is a tube composed of smooth muscle and connective tissue, which opens into a cluster of alveoli. An alveolus is one of the many small, grape-like sacs that are attached to the alveolar ducts.

Lungs: The lungs are the principal organs of respiration. These spongy, pinkish organs look like two upside-down cones in your chest. Lungs are divided into two parts

Right lung: The right lung is made up of three lobes

Left lung: The left lung has only two lobes to make room for your heart.





Diaphragm: The diaphragm is a thin skeletal muscle that separates the abdomen from the chest. It contracts and flattens when you inhale. This creates a vacuum effect that pulls air into the lungs. When you exhale, the diaphragm relaxes, and the air is pushed out of lungs.

I. Tick the correct answer.

1. Trachea is also known as
 - a. Windpipe
 - b. Voice box
 - c. Pharynx
 - d. Nose
2. The movement of air into and out of the lungs
 - a. External respiration
 - b. Ventilation
 - c. Internal respiration
 - d. Respiration
3. The principal organ of respiration is
 - a. Nose
 - b. Larynx
 - c. Trachea
 - d. Lungs
4. The heart is made up of
 - a. Connective tissue
 - b. Epithelial tissue
 - c. Cardiac tissue
 - d. Muscle tissue
5. The heart has_____chambers
 - a. Three
 - b. Four
 - c. Five
 - d. Six



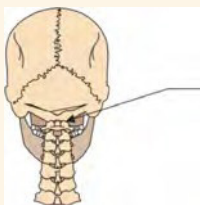
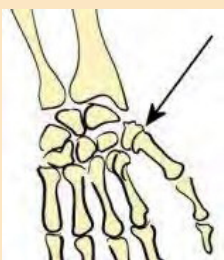


II. Answer the following questions briefly.

1. Define respiration.
2. Write a short note on pharynx.
3. Explain the function of the diaphragm in breathing.
4. Define circulatory system
5. Write a brief note on the heart.
6. What is the difference between Arteries and Veins?

III. Answer the following questions in 150-200 words.

1. What are the functions of respiratory system?
2. What are the functions of the heart?
3. Describe the circulatory system.

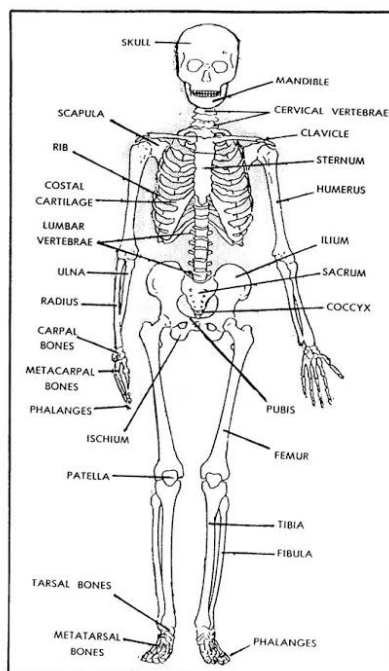
IV. Identify the bones given below and mention the type of Joint that is formed by them. Also mention its function.

Bones	Type of Joint	Functions
		
		
		
		





V. Case Study



On the basis of given picture answer the following questions:-

- Name any four long bones?
- How many bones are there in the vertebral column?
- Scapula is an example of _____.
- How many carpals are there?
- Shoulder joint is an example of _____ joint.

VI. ART INTEGRATION

Working in groups, prepare a 3D model of any one of the systems of the human body that you have studied.

Suggested Readings :

- Dhananjay Shaw (2000), Mechanical Basis of Biomechanics, Sports Publication, Delhi,
- Lutlegen, & Nancy, H. (1997). Kinesiology: Scientific Basis of Human Motion. Mc Graw Hill.
- Physical Education and Yog (373). (n.d.). Retrieved 11 25, 2020, from National School of Open Learning:
- [https://www.nios.ac.in/online-course-material/sr-secondarycourses/physical-education-and-yog-\(373\).aspx](https://www.nios.ac.in/online-course-material/sr-secondarycourses/physical-education-and-yog-(373).aspx)
- Thompson, & Floyd. (2017). Manual of Structural Kinesiology. Mc Graw Hil.

UNIT 8

FUNDAMENTALS OF KINESIOLOGY AND BIOMECHANICS IN SPORTS



Content

Definition and Importance of Kinesiology and Biomechanics in sports

Principles of Biomechanics

Kinetics and Kinematics in Sports

Types of Body Movements - Flexion, Extension, Abduction, Adduction, Rotation, Circumduction, Supination & Pronation

Axis and Planes - Concept and its application in body movements





Learning Outcomes

Students are able to

- understand Kinesiology and Biomechanics with their application in sports.
- explain biomechanical principles and their utilization in sports and physical education.
- illustrate fundamental body movements and their basic patterns.
- learn about the Axis and Planes and their application with body movements.



Usain Bolt Is Still the World's Fastest Man

Usain St. Leo Bolt, or Usain Bolt as he is popularly known (born August 21, 1986, Montego Bay, Jamaica), is the Jamaican sprinter who won gold medals in the 100-meter and 200-meter races in an unprecedented three straight Olympic Games and is widely considered the greatest sprinter of all time.

At the 2008 Olympic Games, Bolt became the first man since American Carl Lewis in 1984 to win the 100 meters, 200 meters, and 4 × 100-meter relays in a single Olympics and the first ever to set world records (9.69 sec, 19.30 sec, and 37.10 sec, respectively) in all three events. (However, a failed drug test by one of his 4 × 100 teammates led to Bolt's having his gold medal in that event stripped.) His 0.66-sec winning margin in the 200-meter race was the largest in Olympic history. His 0.20-sec edge over the second-place finisher in the 100 meters, despite beginning his victory celebration about 80 meters into the race, was the largest since Lewis won by the same margin. At the 2009 world championships, Bolt shattered his 100-meter record, winning the event final in 9.58 sec. Four days later, he broke his 200-meter record by the same 0.11-sec margin to win a second gold medal at the world championships.

After Usain Bolt's victories with World Records in the Olympic Games in Beijing and then in the World Championship in Berlin, our desire to understand the reasons and the basis of his phenomenal running prowess is quite natural. Even an amateur is able to spot a noticeable difference in the running of Usain Bolt and his rivals. Bolt's running is light, playful, relaxed, and at the same time, impressively powerful.

What is it that defines the superiority of this talented sprinter? What does he do better than others, and what parameters of the environment is he using those others don't?

The analysis of Usain Bolt's running technique with the help of biomechanics, kinesiology, anthropometry, and other related sciences provides us with the supporting factors to understand the phenomena that contribute to such remarkable performance.

With his height of 6'5", Bolt is practically the tallest athlete in the World's sprinting history. To some extent, though not directly, it is reflected in the length of his running step. In the final heat on 100m in World Championship in Berlin, Bolt made 41 steps with an average length of 2.44m. His closest competitor Tyson Gay (height 5'11"), made 45.45 steps with an average length of 2.20.

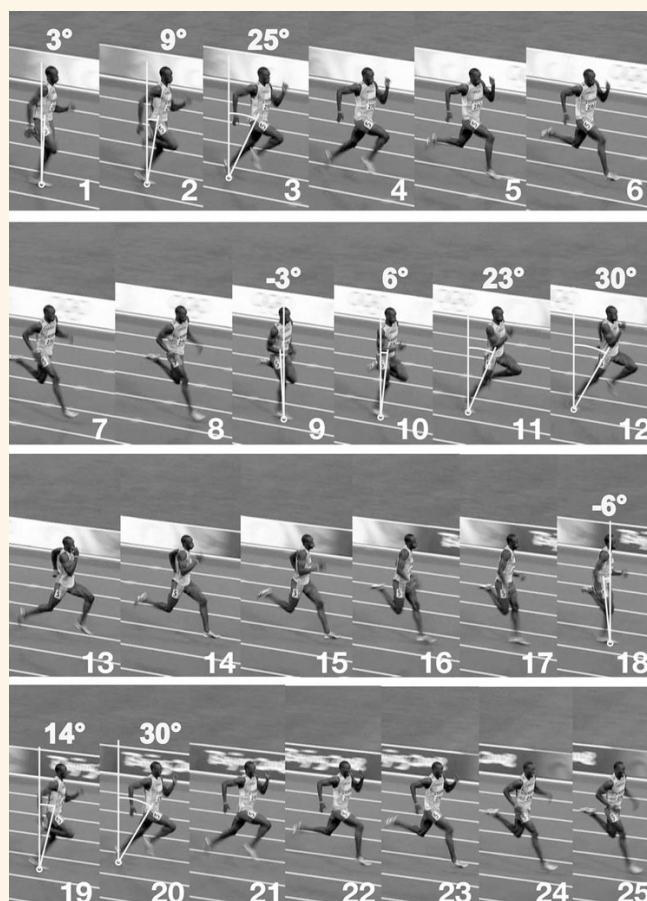
The most crucial factor is that Bolt uses gravity, to be more exact, gravitational torque, as the leading factor that allows him to more effectively involve all other forces, working as a whole and highly effective system for horizontal repositioning



the athlete with high velocity.

Simply speaking, in his running, he uses the body's rotation around the point of support under the action of gravitational torque, which in essence is a free-falling of the body forward.

Therefore, Bolt is more effective as a sprinter. Using a unique speed table (developed together with professor A. Pianzin), which takes into account individual anthropometrical data of the athlete, his step frequency (cadence), etc., We got an average data of angles of falling of Usain Bolt and Tyson Gay in the final 100m of World Championship in Berlin. Bolt's calculated average angle in 100m with the time of 9.58 seconds was 18.5 degrees with an intermediate step frequency (cadence) of 4.28 steps per second (257 steps per minute), and Gay's, with the time of 9.71 seconds - 18.4 degrees, and step frequency (cadence) 4.68 steps per second (281 steps per minute).



Running sequence of Usain Bolt, please disregard the degrees and markers.

Image courtesy of Russian Track and Field Magazine.

At the fastest 20m segment of the distance between 60-80m, where Bolt had the highest speed of 12.42 m/s with the step frequency (cadence) of 4.4 steps per second (264 steps per minute), his angle of falling was reaching 21.4 degrees, the same as Gay's with the average speed 12.27 m/s and the step frequency 4.8 steps

per second (288 steps per minute).

All of this makes sense, i.e., speaking in the language of physics, Bolt just more effectively transforms the rotational (angular) velocity of the body into horizontal. At the end of the day, it is not essential how - consciously or accidentally - Bolt came to this technique; the main thing is that his talent allowed him to perform very well. This technique allows him to use his genetic potential and natural gifts to the fullest and develop his psycho-emotional and mental abilities to the highest level.

Some prognosis about his possible progress. If he manages to increase his average step frequency of running to the level of his rivals, just to something around 4.5 steps per second (270 steps per minute) having the same average angle of falling, his result on 100m could be 9.11 seconds. Isn't it impressive? But he, so far, is dreaming "only" about 9.4 seconds!

Extension Activity

In the sprinting events, there is a need to have an efficient start; look at the different types of start used by the sprinters in short-distance track events. Read the content below and discuss.



Discuss in group

- Identify different types of start in the short sprints.
- Why do different athletes use specific techniques?
- What are the scientific bases for specific techniques?
- Which technique is the best according to you and why?
- What are the kinesiological and biomechanical advantages of different techniques?

Note: Study of kinesiology and biomechanics will help you answer the following questions, and you will also be able to correlate the techniques and the human movements.

8.1.1 Concept of Kinesiology and Biomechanics

Sports activities are good for health, and everyone wants to remain fit, but only some people know the logic and facts involved in these fitness activities, or you can say





the technical points behind the same. Biology and Physics play a vital role in defining the technicalities behind movement. Coaches and teachers have been engaged with these technicalities and put them to best use in improving the performance of athletes. Knowledge of physical activity is learned through experience, scholarly study, and professional practice. In today's world of sports, knowledge of kinesiology and biomechanics plays a significant role in identifying, designing, and applying a training programme to achieve the best performance. So, insight into kinesiology and biomechanics will always help teachers, coaches, doctors, and sports professionals have the upper hand in their specialty areas.

Kinesiology is the scholarly study of human movement, and biomechanics is one of the many academic subdisciplines of kinesiology. Biomechanics in kinesiology involves the precise description of human activity and the analysis of human movement causes. The study of biomechanics is relevant to professional practice in many kinesiology professions. The physical educator or coach teaching movement techniques and the athletic trainer or physical therapist treating an injury use biomechanics to analyse movement qualitatively.

Kinesiology is 'the science of movement' or 'the study of movement.' It includes the study of movement through anatomy and mechanics, whereas Biomechanics is the 'analysis/ study of forces' and the 'application of the principles of physics and their effect on the human body. In short, we can say that biomechanics is the central part of kinesiology.

8.1.2 Meaning of Kinesiology in Sports

Kinesiology is derived from the Greek word kinesis, which means movement, and logos which means to study. Thus, kinesiology is a discipline that studies movements. It is a study of human movement and muscular function. The study of kinesiology seeks to understand the impact of muscle function on health. It draws upon the concepts for several sciences, including biomechanics, anatomy, physiology, and neuroscience. The study of Kinesiology seeks to understand the mechanism of human movement and pinpoint the specific muscle involved in a particular movement. The science of kinesiology views the human body as a machine that functions in a very purposeful way.

Kinesiology, or human kinetics, is a scientific study of human movement. Kinesiology addresses physiological, mechanical, and psychological mechanisms. Applying kinesiology to human health includes strength and coordination, sports psychology, methods of rehabilitation, such as physical and occupational therapy, and sports and exercise.





Do you Know

Aristotle (384-322 BC) is called “father of kinesiology.” Aristotle wrote about three centuries before Christ, “the animal that moves makes its change of position by pressing against that which is beneath it. Hence, athletes jump further if they have the weights in their hands than if they have not, and runners run faster if they swing their arms, for in extension of the arms there is a kind of leaning upon the hands and wrists.” Hart said, “from the point of view of mechanics, we may regard Aristotle’s work as the starting point of a chain of thought which played an important part in the evolution of the subject.”

Aristotle was the first to analyse and describe the complex process of walking, in which rotatory motion is transformed into translatory motion. Aristotle’s treatise, *Parts of Animals, Movements of Animals and Progression of Animals*, described for the first time the actions of the muscles and subjected them to geometrical analysis. The ideas expressed by Aristotle were the forerunners of the ideas of Newton, Borelli, and others. His concepts of leverage, gravity, and laws of motion were remarkably accurate.

8.1.3 Definitions of Kinesiology

“Kinesiology refers to the whole scholarly area of human movement study, while biomechanics is the study of motion and its causes in living things.”

“Kinesiology is a term formed by the combination of two Greek words, Kinesin, meaning to move, and logos, meaning to discourse.” (Rasch & Burke, 1978). When viewed as a discipline, “kinesiology can be defined as studying the movement behaviour of all living organisms.” (Burke R.K 1977).

8.1.4 Importance of Kinesiology in Sports

1. **Analysing human motion:** The knowledge of kinesiology offers future coaches/ trainers/ physical education teachers a clear insight into the analysis of human movement and helps them understand how motor skills and techniques can be improved to ensure successful participation in various physical activities. Example: analysing fundamental movements with reference to sports skills performed.
2. **Learning and improvement of motor skills:** With the knowledge of kinesiology, a coach or teacher learns the nature and effects of each physical activity. This enables him to select intelligently the exercise which will contribute to achieving the targeted aims for an individual, thereby improving the motor skills to the level of perfection. Example: Teaching and applying correct walking and running patterns for trainees and athletes.





3. **Applying anatomic background will help to prevent injuries:** With the knowledge of kinesiology, one can understand the nature and mechanism of most common musculoskeletal injuries. The appropriate preventive conditioning flexibility and muscle-strengthening exercises help prevent athletic injuries. Applying kinesiological principles to the acts of landing, falling, catching, etc., also, to some extent, prevents injuries on the sports fields. Similar know-how of the muscles will help design appropriate activities and exercises for re-educating the weak muscles during the treatment and rehabilitation of the injuries.
4. **Ensuring economy of movement:** Kinesiology helps analyse the physiological relation, energy utilization, and muscular contraction timing of the physical activity and exercises. The structure and mechanics of human performance are also not ignored in the financial world. Example: minimizing the body movement to regulate energy utilization and improve timing in long-duration activities.
5. **Ensuring effectiveness of movement:** Knowledge of the principles of kinesiology assists in recognizing and analysing the quality of awkward and skilful movements and correcting irregular movements so that movement efficiency can be achieved. Example: Analysing body positioning during snatch and correcting the technique to minimize the change of error in competition.
6. **Aiding clinical purposes like postural analysis, corrective exercise, and rehabilitation:** Kinesiology also helps to identify errors in posture through posture analysis and helps to correct them with the help of corrective exercises and rehabilitation. Example: Analysis of posture among students in school and correcting them if required, with the help of corrective exercise.
7. **Designing and teaching exercise and conditioning:** The importance of kinesiology is to aid the improvement of human structure through intelligent activities and efficient use of the body. The human system improves with the service provided it is used per the principles of kinesiology and efficient human motion. Kinesiology helps improve the individuals' general physical condition and fitness through routine exercise and conditioning design. Example: Teaching students the correct position during sit-ups while training and assessment of physical fitness.
8. **Discovering and recognizing the underlying principles of movement:** Kinesiology is the fundamental science in preparation of professionals in the area of human motion, whether they are in physical education, physical therapy, athletic training, or any other related profession. It provides us knowledge about various parts of the locomotor system. In kinesiology, we get to learn about the particular muscles, bones, and joints that are involved in a particular movement, and to what extent; what principles of mechanics are involved in



the exercises or the activities; what is the effect of gravity and other forces on the muscular system; and how the bones serve as the anatomic levers in the human body and how the muscles provide the necessary force to move the body levers. Kinesiology thus helps us learn and analyse all these aspects and the movements of the human body and discover their underlying principles to improve performance.

9. **Designing and teaching fundamental movements:** Physical educators and coaches apply the knowledge of kinesiology mainly to the movements of the normal body. However, physical educators and the therapists, have one common application in studying kinesiology; they are both concerned with posture and body mechanics of daily life skills and analysing the anatomical and mechanical basis of movement.
10. **Acquiring self-realization about own performance:** Since each sports person has his abilities and potentialities kinesiology helps the coaches and selectors match the performer to the activity and the activity to the performer. Example, basketball players can analyse if they need to correct to improve their jumping ability, which can improve their performance.
11. **Enables effective teaching of motor skills (fundamental motor and specialized motor skills):** Kinesiology helps prepare the physical educator to teach effective performance in both fundamental and specialized motor skills. Perfecting the performance refers to mastery and perfection in the technique and defining standards of skill. On the other hand, perfecting the performer means that an individual sportsperson is made perfect in the given act. The intelligent selection of the methods, skills, and activities help perfect the performer and performance.
12. **Ensures evaluation of exercise and activity and their effect on the human structure:** Physical educators or coaches, who deal with physical development or motor skills, are aided in their job by the knowledge and understanding of kinesiological principles. These help them assess and evaluate the extent of effect produced by exercise and movement to achieve the purpose for which these were prescribed.
13. **Providing benefit to physiotherapists and physical medicine professionals:** Knowledge of kinesiology has a three-fold purpose both for the professionals of physical education and physical medicine in the analysis and modification of human movement. Kinesiology enables them to help their trainees or clients perform with optimum "safety," "effectiveness," and "efficiency." "Safety" should be a significant concern for all the movement professionals while designing or selecting movements or activities to avoid doing any harm to the body





8.2.1 Meaning of Biomechanics

The word biomechanics (1899) and the related biomechanical (1856) come from the Ancient Greek *bios* that means life and *mechanike* or *mechanics* refers to the study of the mechanical principles of living organisms, particularly their movement and structure.

Biomechanics is the study of the mechanics related to the functional and anatomical analysis of biological systems, mainly of humans. Study of biomechanics is necessary to study the body's mechanical characteristics and principles and to understand its movements.

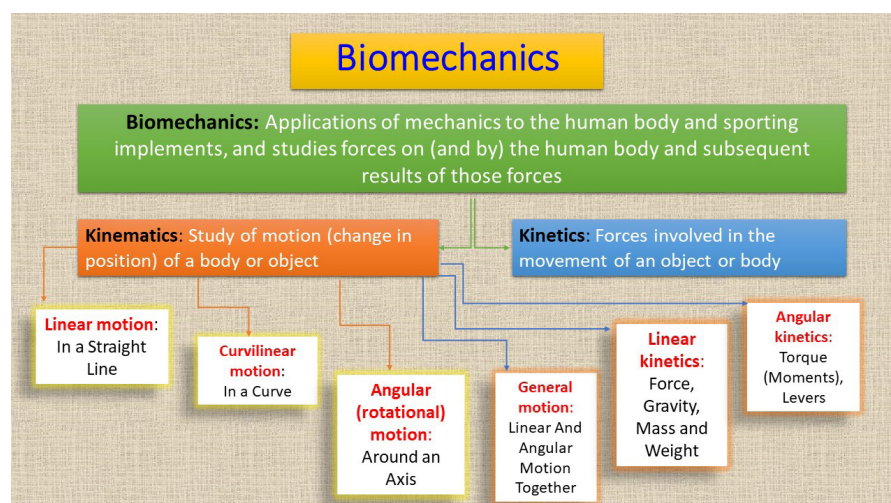
Within "mechanics" there are two sub-fields of study. One is statics which is the study of systems that are in a state of constant motion either at rest (with no motion) or moving with

a constant velocity; and the second one is dynamics, which is the study of systems in motion in which acceleration is present, which may involve kinematics and kinetics.

Kinematics is the study of the motion of bodies with respect to time, displacement, velocity, and speed of movement either in a straight line or in a rotary direction. Whereas, Kinetics is the study of the forces associated with motion, including forces causing motion and forces resulting from motion.

Sports biomechanics is a quantitative-based study and analysis of professional athletes, sportspersons and sports activities in general. In simple terms, it describes the physics of sports. In this subfield of biomechanics, the laws of mechanics are applied to sporting events through mathematical modeling by means of computer simulation, and measurement in order to gain a greater understanding of athletic or sporting performance.

In simple words, sports biomechanics can be expressed as the science of explaining how and why the human body moves in the way that it does





Do you Know

Do you know how much strain you put on your body when pushing, pulling, or lifting to move and handle patients with manual aids? Musculoskeletal disorders continue to be an issue among health personnel, and it is more important than ever that we realize that patient transfers present a serious risk of work injuries.

A biomechanical calculation is a method that calculates how large the load on the musculoskeletal system is in any given situation. For example, it is possible to calculate how much strain is on the discs in the lumbar region if a person is standing with a straight back tilted forwards 45 degrees.

To calculate that, we need some values first:

- Height and weight of the person performing the transfer
- How many degrees the person is bending forwards during the transfer
- How much the patient being transferred weighs
- And how far the reaching distance is

For example, we might have a situation with a person who weighs 80 kilos, is 186 cm tall, and is bending 45 degrees forward, lifting a weight, weighing 10 kilos, at a reaching distance of 30 cm. This case will result in a strain of approx. 255 kg on the disc in the lumbar region (or the weight of the object).

8.2.2 Definitions of Biomechanics

Biomechanics has been defined as studying the movement of living things using the science of mechanics (Hatze, 1974).

“The area of study wherein knowledge and methods of mechanics are applied to the structure and function of the living human system.”

“Biomechanics is the science concerned with the internal and external forces acting on a human body and the effects produced by these forces”. James. G. Hay

8.2.3 Importance of Biomechanics in Sports

1. **Basis for analysing the efficient structure of competitive performance:** Human movement performance analysis can be done in many ways; biomechanics is essentially the science of movement technique and tends to be most utilized in sports where technique is a dominant factor rather than the physical structure or physiological capacities (Analysis the performance of 9.63 at the 2012 London Olympics by Usan Bolt). Following are some of the areas where biomechanics is applied to analyse the efficient structure of competitive performance are given below:





- GAIT Analysis
- Cinematography,
- Videography,
- Electromyography (EMG),
- Accelerometer,
- Dynamometry,
- Electrogoniometry
- The analysis of sport and exercise equipment, e.g., shoes, surfaces, and rackets.

2. **Practical organization of the process of the sport's technical profession:** Sports professionals use technology that helps assess an athlete's performance, using data to track performance, health, and leveraging visual tools that can show how athletes at all levels can improve. Knowledge of Biomechanics helps them apply such tools and obtain data in training, treatment and achieving optimum performances.
3. **Essential for the effective organization of the development of motor abilities:** Sports and games focus on reaching maximum efficiency in motor abilities connected to a particular sports discipline. Motor abilities can be described as relatively stable sets of inner genetic presuppositions needed to carry out locomotive activities. They include force, speed, endurance, coordination, and flexibility. Knowledge of biomechanics helps a coach and teacher understand and apply systematic training for development.
4. **For Diagnostic teaching:** Diagnostic teaching is the process of discovering an athlete's individual abilities, needs, and objectives and prescribing requisite learning assessments. Instructors monitor the trainee's understanding and performance before, during, and after teaching a lesson. Reviewing can inform instructors of their efficacy when conducting assessment and guide them towards areas they need to emphasize in class to aid the athlete's understanding of the material for better learning.
5. **For diagnostic coaching:** Training diagnostics examines and evaluates training and organizational performance through systematic assessments, analysis, and data collection. Knowledge of biomechanics helps a coach and a trainer design training schedule.
6. **For self-evaluation of athletes:** The ultimate aims of an athlete - optimal athletic performance, and reduced risk for injury - go hand-in-hand. The better an athlete's technique through each movement, the better she/he is likely to perform and the more she/he will avoid injuries. Using biomechanics, athletes can look at every tiny detail of how they run, jump, throw, change directions,



- and many other related tasks. The information is invaluable. Example: if an athlete is not optimally bending her/his knees during a jumping or landing task, she/he can focus their training to improve their performance through motor learning and improved strength and balance training.
7. **Designing and accepting equipment:** Advances in sports equipment have revolutionized athletic competition with engineers developing equipment that can enhance performance. Biomechanics not only helps in designing new equipment but also tends to measure the efficiency and effectiveness of equipment as per training requirements. Example: T-shirts, studs, spikes, swimming costumes, hockey sticks, different-sized footballs, and low-weight helmets for protection.
 8. **Evaluate and change the rules and regulations:** Biomechanics is the study of the structure and function of biological systems using the methods of “mechanics,” which is the branch of physics and mechanics involving analysis of the actions of forces. Thus, the laws of mechanics are applied to human biomechanics to have a better understanding of athletic performance through mathematical modelling, computational simulation, and experimental measurement. During such analysis, rules and regulations can be modified for the athlete’s safety and performance enhancement.
 9. **Evaluate new techniques:** The most common method for improving performance in many sports is to improve an athlete’s technique. The application of biomechanics to improve technique may occur in two ways: Teachers and coaches may use their knowledge of mechanics to correct actions of a trainee or athlete to improve the execution of a skill, or a biomechanics researcher may discover a new and more effective technique for performing a sport skill by introducing new technologies. In the first instance, teachers and coaches use qualitative biomechanical analysis methods in everyday teaching and coaching to effect changes in old techniques with the new ones. In the second instance, a biomechanics researcher uses quantitative biomechanical analysis methods to discover new techniques, which then must be communicated to the teachers and coaches who will implement them.
 10. **Select techniques about their suitability to the athletes:** Likewise, biomechanics help in developing new techniques in different games and sports; it also helps in selecting techniques for an athlete based on the one most suitable for them which will help them to improve their technical efficiency and bring performance in competition. Example: For a sprinter who is short, a bullet start is preferable in short-distance sprinting events as it helps them to have an efficient start with effective block clearance time and force impulse on the front and rear starting blocks as well as take-off velocity and acceleration





11. **Selection of players:** Biomechanics helps in understanding the complete human body. Knowledge of biomechanics provides the teachers and coaches with a better understanding of the human body in terms of structural and functional qualities as also the various internal and external forces that affect movement. This understanding helps a teacher and coach to select the players according to the requirements of the sport. Example: short players for gymnastics and tall players for Volleyball etc.
12. **Design and develop exercises for the best outcome:** Employing the principles of Biomechanics enhances performance by utilizing mechanical principles to improve an individual's technique, decide the exercise they use, and modify specific training protocols that the coach or trainer implements to help an individual achieve their utmost potential. Biomechanics is used to develop an exercise that improves performance and reduces the chance of injury since it is designed based on how the body is going to adapt to the biomechanical stress placed upon it. Example: Instead of a full-squat an athlete can perform a half-squat with less stress on the knee joint and lower back muscles.
13. **Prevention and rehabilitation of injuries:** Injuries are fairly common on the sports field. However, a good knowledge of biomechanics helps in preventing injury in various ways. Example, analysis of the runner's style of running, her/his arm swing, foot strike, and even trunk leaning will determine the cause of injury. In fact, just as biomechanics is useful in identifying what forces may have caused an injury, it also helps determine how to prevent the injury from recurring. It also helps in the process of rehabilitation of injuries by helping determine the exercises that may help in the process of rehabilitation. Biomechanics is used to provide the basis for changes in techniques, equipment, and training to prevent injuries.

I. **Tick the correct options**

1. The science that deals with the movement aspect of the human body is known as
 - a. Physiology
 - b. Anatomy
 - c. Botany
 - d. Kinesiology
2. The scientific study of the human or non-human body movements it is known as
 - a. Physiology
 - b. Anatomy



- c. Biology
 - d. Kinesiology
3. Sports biomechanics can be described as-
- a. Mechanics of sports
 - b. Kinesiology
 - c. Physics of sports
 - d. Sports dynamics

II. Answer the following questions briefly.

- 1. Define Kinesiology.
- 2. Define Biomechanics.
- 3. List the importance of Kinesiology in sports.

III. Answer the following questions in 150-200 words.

- 1. Explain the importance of Biomechanics in the field of sports.
- 2. Explain the importance of Kinesiology in the field of sports.
- 3. 'Knowledge of biomechanics helps in the selection of players', Discuss in the context of any one game of your choice.
- 4. 'Knowledge of kinesiology help to design and teach fundamental movements', justify.
- 5. What do you understand by the concept of sports biomechanics? Write in your own words with suitable examples from sports?

Extension Activity

Working in groups, identify the activities in you school, among yourself, where you can relate biomechanics and kinesiology, and list any five below.

S. No.	Activities	Relationship
1.		
2.		
3.		
4.		
5.		

8.3.1 Principles of Biomechanics in Sports

The nine principles of biomechanics constitute the minimum number of core principles that can be applied to all human movements. The principles can be organized into





ones dealing primarily with the creation of movement (process) and ones dealing with the outcome of various projectiles (product). These principles are based primarily on the work of several bio-mechanists (Norman, 1975; Hudson, 1995) who have developed generic biomechanical principles for all human movements. Many biomechanics books have proposed general principles for all movements (Meinel & Schnabel, 1998); various categories of human movements like throwing, catching, and running (e.g., Broer & Zernicke, 1979; Dyson, 1986; Kreighbaum & Barthels, 1996; Luttgens & Wells, 1982); or specific movements (e.g., Bunn, 1972; Groves & Camaione, 1975). Some bio-mechanists believe that general principles applicable to all sports are difficult to identify and have limited practical application due to unique goals and environmental contexts of skills (Hochmuch & Marhold, 1978).

8.3.2 The Nine Biomechanics Principles are:

1. Force-Motion
 2. Force-Time
 3. Inertia
 4. Range of Motion
 5. Balance
 6. The Coordination Continuum
 7. Segmental Interaction
 8. Optimal Projection
 9. Spin
1. **Principle of Force-Motion:** The Force-Motion Principle states that it takes unbalanced forces (and the subsequent torques they induce) to create or modify our motion. Unbalanced forces act on our body, or an object, creating or modifying movement. A free-body diagram is a simplified model of any system or object drawn with significant forces acting on the object. Forces must act first before changes in motion can occur. Force-Motion Principle suggests that muscle groups that primarily contribute to interest motion should be trained. Example: Standing still- forces acting on a person are equal and because of this there is no movement.
 2. **Principle of Force-Time :** The Force-Time Principle states that modification of movement depends on the timing of force application as much as the size of the forces used to create it. It is not only the amount of force that can increase the motion of an object, as also the amount of time over which power can be applied to affect the resulting motion. Increasing the time to use force is also essential in slowing down objects (catching) and landing safely. (Impulse = Force x Time. The greater the time of which force is applied the greater



the resulting motion.) Example: Using the sweep shot in hockey wherein more force and time are applied giving it much more power than a hit.

3. **Principle of Inertia :** Inertia can be defined as the property of all objects to resist changes in their state of motion. The linear and angular inertia measures are mass (m) and moment of inertia (I). We will see that inertia can be viewed as a resistance to motion in the traditional sense, but this property can also be used to an advantage when modifying movement or transferring energy from one body segment to another. Example: To stop a shotput or a netball travelling through the air a force must be applied to it. The force is much higher to stop a shotput because it is heavier than a netball. Therefore, the shotput has more inertia.
4. **Principle of Range of Motion:** Range of Motion is the overall motion used in a movement; it could be linear or angular motion of the body segments. The purpose of some movements might require that somebody segments limit range of motion, while others requiring maximum speed or force might require more extensive ranges of motion. Increasing the range of motion in a movement can effectively increase speed or gradually slowdown from a high speed. Since moving through a range of motion takes time, this principle is related to the force-time principle. The Range-of-Motion Principle states that less range of motion is most effective for low-effort (force and speed) and high-accuracy movements. In contrast, a more excellent range of motion favours maximum efforts related to rate and overall force production. Example: Reduced Range-of-Motion (R.O.M) = Throwing a dart and Increased (R.O.M) = Throwing a javelin
5. **Principle of Balance:** Balance is a person's ability to control their body position relative to some support base. Stability and mobility of body postures are inversely related. In other words, the degree of control over stability or instability depends on several biomechanical factors. It relates to centre of gravity, stability, and equilibrium. To increase stability, increased base of support and lower centre of gravity increases mass of the body. Line of gravity should fall in the middle of your base of support for maximum stability. Example: Sumo wrestlers have a very wide and low stance to maximise their stability when wrestling. They also train to have an extremely large mass.
6. **Principle of Coordination Continuum:** How the muscle actions and body segment motions are timed in a human movement is usually referred to as coordination. The Coordination Continuum principle says that determining the optimal timing of muscle actions or segmental motions depends on the movement's goal. More simultaneous muscle actions and joint rotations are usually observed if high forces are the movement's goal. Low-force and high-speed movements tend to have more sequential muscle and collective efforts. These strategies (simultaneous/sequential) can be viewed as a continuum,





with the coordination of most motor skills falling somewhere between these two strategies. Example: Simultaneous = weight lifting and Sequential= Base Ball Pitcher

7. **Principle of Segmental Interaction:** The principle of Segmental Interaction says that the forces acting in a system of linked rigid bodies can be transferred through the links and joints. Muscles usually work in short bursts to produce torques that are precisely coordinated to complement the effects of torques created by forces at the joints. (Transfer, summation, sequential). Example: In Golf and Tennis shots, the player uses his body parts in order to create maximum power. (Begins with the largest, slowest, and strongest segments and works through to the slowest and fastest segments).
8. **Principle of Optimal Projection:** The biomechanical principle of optimal projection says an optimal range of projection angles for a specific goal for most human movements involving projectiles. There is an optimal angle of projection to achieve a specific goal. Maximum speed/distance of an optimal angle=45 degrees. Example: maximum distance can be achieved by hitting a golf ball on a level plane this causes the golf ball to be hit at exactly 45 degrees.
9. **Principle of Spin:** The principle of Spin or rotations applies largely to projectiles, and particularly sports balls. Spin is desirable on thrown and struck balls because it stabilizes flight and creates a fluid force called lift. This lift force is used to create a curve or counter gravity, which affects the trajectory and bounce of the ball. Spin stabilizes the orientation of the ball, which ensures aerodynamically efficient flight. Example: A tennis player putting a top spin on a ball to make it drop quicker.

Extension Activity

Discuss with your group

- How can the study of sports biomechanics help a coach to train their trainee in a better scientific manner?

Design a poster to show the importance of sports biomechanics in Physical Education and Sports

I. Tick the correct options

1. _____ is a person's ability to control their body position relative to some support base.
 - a. Inertia
 - b. Balance
 - c. Spin
 - d. None form above



2. Simultaneous = weight lifting and Sequential = Base Ball Pitcher is an example of
 - a. Inertia
 - b. Balance
 - c. Spin
 - d. Coordination Continuum
3. Using the sweep shot in hockey, wherein more force and time are applied, gives it much more power than a hit and is an example of which Principle of Biomechanics.
 - a. Force-Motion
 - b. Force-Time
 - c. Range of Motion
 - d. Segmental Interaction

II. Answer the following questions briefly.

1. Define principle of optimal projection.
2. Define principle of force-time.

III. Answer the following questions in 150-200 words.

1. List down the principles of biomechanics and explain any 2 in detail.

8.4.1 Kinetics and Kinematics in Sports

The human body has evolved to its present form through many mutations. It may be unique concerning its anatomy and physiology, but the same laws and principles that govern all other animate and inanimate objects in the universe are also applicable to humans. All motor skills are performed with an implement (bat or racket) or without being influenced by one. In most instances, a number of these physical laws and principles are commonly considered mechanical laws and principles, and they may be classified as static or dynamic involving, on the one hand, objects in a state of static equilibrium and, on the other, objects in motion. Dynamics is further subdivided into Kinematics and Kinetics.

Sports biomechanics is traditionally divided into the study of kinetics and kinematics. Kinetics is the study of the relationships between the forces acting on the body and how those forces affect motion. Kinematics is the geometry of objects' motion, including displacement, velocity, and acceleration. In simple terms, kinetics studies the muscles that cause movement (gravity, friction, etc.), while kinematics describes the motion (velocity, acceleration, etc.)





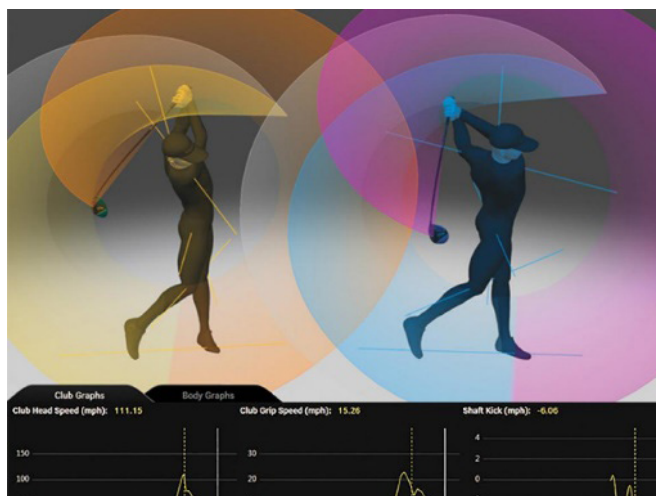
Kinematics analyses motion in terms of time, displacement, velocity, or acceleration. In the language of science, it is the geometry of motion, describing the above four states of motion as they occur either in a straight (linear) line or in a rotary (angular) direction. Thus, we can say that Kinematics is the mechanics of motion without reference to the forces causing that motion - so only from a geometrical point of view. This is the displacement and velocity of your body's segments and joints.

Kinetics is the action of forces in producing or changing motion. This considers the influence of various interacting objects and how they react with one another. Therefore, we can say that Kinetics is that aspect of dynamics that considers the force that causes objects or bodies to move. Force may be a pull or a push. All levers in the human body are pull-type machines, but in performing skills, the element of inspiration becomes a mechanical part of the actual skill, like the hand's force that 'pushes' the shot. Human levers produce force to overcome resistance, and this action is working. Kinetics considers the forces which cause motion and includes Newton's three 'Laws of Motion'. For example, in the study of the golf swing, kinematics focuses on details of the swing 'motion' such as the shape of the clubhead, its path, position of the body and club at various swing events, velocities of the body parts and club, and the timing of slow-down of the body for speed-up of the club. To accurately describe the swing motion, it is essential to measure it accurately. Therefore measurement of motion is one of the central aspects of kinematics.

Do you Know?

Kinematics and kinetics are sub-areas of biomechanics. Kinematics is the study of the description of motion, while kinetics is the study of the explanation of motion. In kinematics, the focus is on the object's motion, while kinetics focuses on the cause of motion dealing with the 'why.'

Fundamental kinematic quantities include time, position, displacement (distance), velocity (speed), and acceleration. In addition to these, shapes of trajectories of various points on the body, club, and orientation of motion planes of multiple body segments and clubs are also kinematic issues. A complex motion of an object can be resolved into the linear motion of the centre of mass (COM) of the body and the angular motion of the body about its COM, which is also a kinematic issue. The kinematic sequence plot is based on the angular velocity patterns of body segments, lines, and clubs.



Picture source: <https://www.golfdigest.com/story/stuff-gears-golf>

Do you Know?

The Fundamental Differences Between Kinetics and Kinematics

S.No.	Attributes	Kinetics	Kinematics
1.	Definition	Kinetics is the study of motion considering the mass and external forces as well.	Kinematics is not dependent upon the mass of the object.
2.	Relation	It attempts to determine the relationship between the motion of bodies caused by inertial force and the mass of a body.	Kinematics is about simply describing motion. Such as velocity, displacement, time, and acceleration.
3.	Study	Study of the motion caused by forces, gravity, friction, torque	To determine the "how" of motion.
4.	Nature	It attempts to get at the cause.	It is descriptive and based on observation
5.	Treated	Treated in terms of energy transformations	Treated geometrically
6.	Example	A person sitting inside the train. A child running around in the house, running fan	A Moving Train Parabolic locus traced by a football. A stone hitting the ground.
7.	Uses	Concept of gas laws, fluid dynamics, physical chemistry	Classical mechanics in terms of engineering.





I. Tick the correct options

1. The kinematics analyses motion in terms of
 - a. Time
 - b. Displacement
 - c. Velocity
 - d. All of the above
2. Sports biomechanics is traditionally divided into the study
 - a. Kinetics
 - b. Kinematics
 - c. Both a and b
 - d. None of the above

II. Answer the following questions briefly.

1. Define Kinetics.
2. Define Kinematics.
3. List the importance of Kinesiology in sports.

III. Answer the following questions in 150-200 words.

1. List down the difference of kinetics and kinematics.

8.5.1 Movement

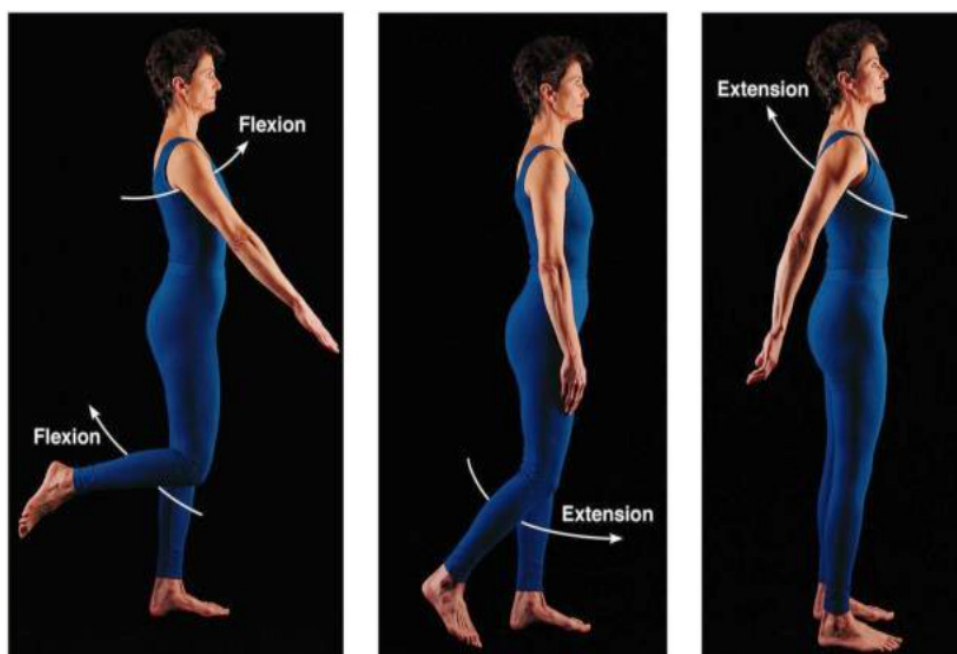
Movement or motion is the act of moving, change of place or posture, or transference, by any means, from one situation to another. Humans can move from one place to another through coordinated movements and postures. The movement produced by the human body due to the contraction of muscles and bending of bone joints is called human movement. Human movements are controlled by the nervous system. Hence, human movement incorporates the use of muscles, ligaments, joints, and bones.

Movement is one of the things that differentiates a living thing from a non-living thing. As referred to earlier, movement is the change in the position of an object. In the human body, it takes place when the living organism moves a body part or a combination of parts to bring about a change in position. We use the term locomotion to describe the movement which results in the change of position of the whole organism. It is important to understand the difference between the two - movement and locomotion - in relation to living things.

There are a variety of movements that happen in the human body, e.g., the movement of eyelids, heart muscles, jaw, and teeth. In addition, more complicated movements are performed in sports and games. To understand such basic to complex movement let's discuss the fundamentals of movement first.

8.5.2 Types of Body Movements

1. **Flexion**- it is the bending of flexing a limb. Closing/ decreasing the angle at the moving joint.
2. **Extension**- it is straightening or extending a limb. Opening/ increasing the angle at the joint. It is the opposite movement of flexion.



Picture source: <https://www.slideserve.com/garan/body-movements>

3. **Abduction**: - Moving a Limb away from the body's centreline.
4. **Adduction**: - Moving a Limb towards the body's centreline is called adduction.
5. **Rotation**: It is the movement around the long axis.

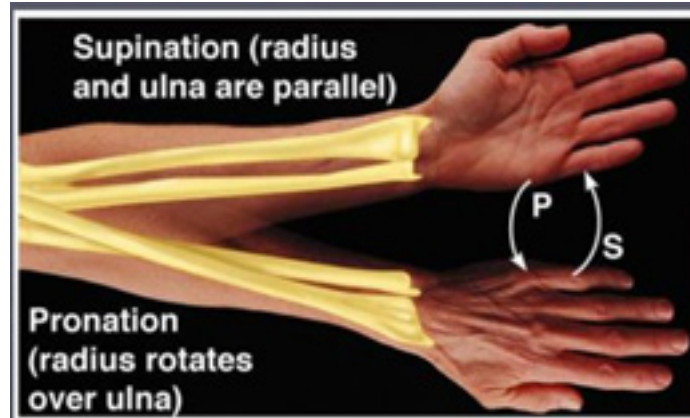


Picture source: <https://www.slideserve.com/garan/body-movements>





6. **Circumduction:** It combines flexion, extension, abduction and adduction. Usually this movement occurs at ball and socket joints like shoulder joint, hip joint, etc.
7. **Pronation:** It means turning the palm down.
8. **Supination:** It means turning the palm up.



Picture Source: <https://www.slideserve.com/garan/body-movements>

8.5.3 Axis and Planes

In kinematics, the limbs or segments of the body are assumed to rotate about the joints, with no translational, or sliding, movement. While this is not strictly correct, it offers a usable approximation of the actual joint motion. The joint serves as an axis (a line around which something can rotate), and associated with the axis is a plane, (like a sheet of paper perpendicular to the axis), in which the rotational movement takes place.

For a better understanding of the axis and planes of movement, we must know the following terminologies:

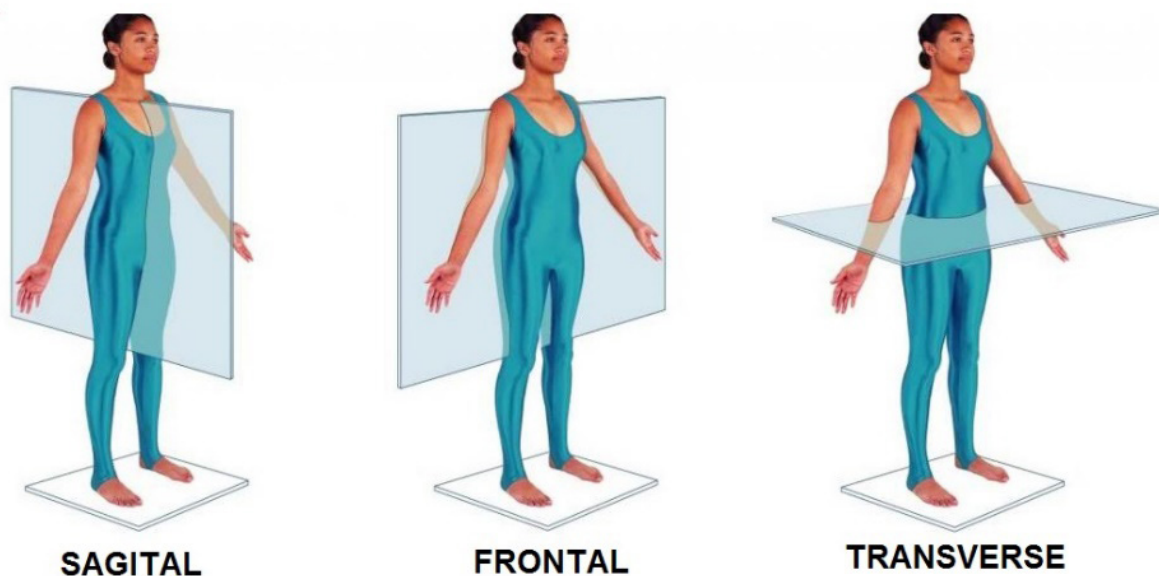
- Anterior/ Ventral- towards the front of the body
- Posterior/Dorsal- towards the back of the body
- Superior/Cranial- towards the head of the body or upper part of the body.
- Inferior/Caudal- towards the lower part of the body.
- Medial- towards the midline of the body (inner side).
- Lateral- away from the midline of the body (outer side).

8.5.4 Plane

A single plane divides the entire body into two parts. There are three planes of motion in which our body moves. Most of our moments are not straight up or down or side to side or in a single direction etc., especially in sports.

- a. **Sagittal plane (Median plane):** - It lies vertically and divides the body into right and left parts. Flexion and extension types of movement occur in this plane. Example: kicking a football, chest pass in netball, walking, jumping, and squatting.
- b. **Frontal plane (lateral or coronal plane):** - It also lies vertically and divides the body into anterior/ Ventral- and posterior/ Dorsal- parts. Abduction and adduction movements occur in this plane. Example, jumping jack exercises, raising and lowering arms and legs sideways, and cartwheel.
- c. **Transverse plane (horizontal plane):** - It lies horizontally and divides the body into superior and inferior parts. Rotation types of movement occur in this plane. Example, hip rotation in a golf swing, twisting in a discus throw, pivoting in netball, and spinning in skating.

“The centre of gravity may be defined as the point at which the three planes of the body intersect each other”.



Picture Source: <https://apki.or.id/klasifikasi-gerak-sendi-bagian-4/>

8.5.5 Axis

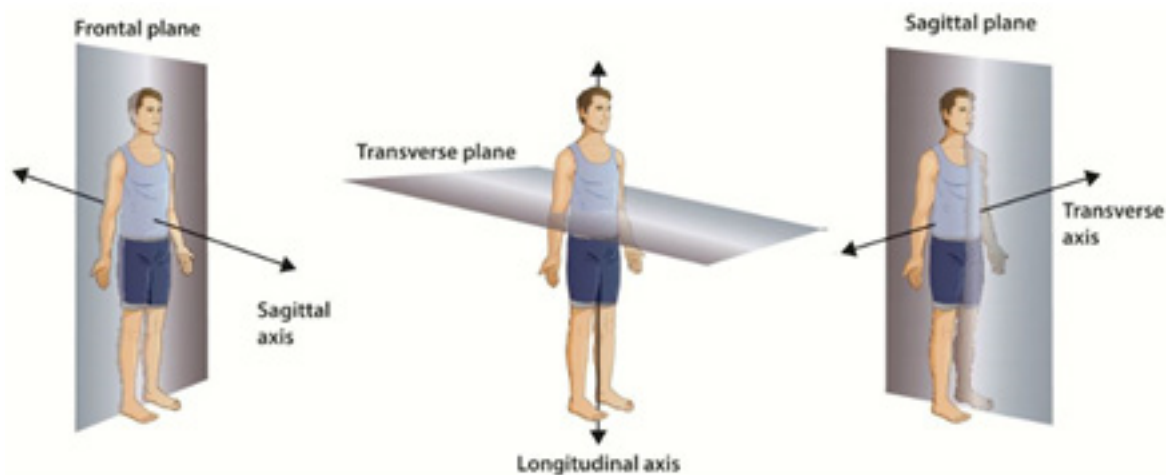
An axis is a point or straight line around which an object moves or moment of the body segments occurs. There are three axes of rotation, and each axis is perpendicular to the plane.

- a. **Sagittal axis:** - It is also called the anteroposterior axis. It passes horizontally from posterior to anterior. It is perpendicular to the frontal plane. The movements that occur in this axis are abduction and adduction.





- b. **Frontal axis (transverse axis):** - It is also known as the horizontal and mediolateral axis. It is perpendicular to the sagittal plane. It runs from side to side. Flexion and extension are the movements taking place in this axis.
- c. **Vertical axis (longitudinal axis):** - It is perpendicular to the transversal plane. It passes vertically from inferior to superior. Typically, rotation types of movement take place on this axis.



Picture Source: https://d1e4pidl3fu268.cloudfront.net/37ea7a9c-cd02-4d6f-bd87-5e802a22ad7d/FrontCover.crop_983x738_2,0.preview.PNG

8.5.6 Concept and its application in Body Movements

Movement is generally referred to by the particular plane it occurs in. An example of this would be a description of walking as a sagittal plane movement. In reality, this is only a description of the gross direction of movement. At the individual joint level, movement will occur in all three planes, not solely in the sagittal plane. Example, during walking, the hip will be flexing/extending in the sagittal plane, adducting/abducting in the frontal plane, and internally/externally rotating in the transverse plane.

The same concept applies to all the individual joints in the lower limbs. The movement that you effectively “see” does not represent what is occurring in terms of motor control and force absorption within all three planes. Example, the most apparent hip movement is expressed in the sagittal plane during gait. Still, there is an interplay between eccentric force absorption and concentric force production in all three planes at the joint. The hip subtly decelerates internal rotation and adduction and accelerates external rotation and abduction.

This simultaneous movement can be seen as one motion with three components - it can be termed tri-planar motion. The exercise professional must be comfortable with the concepts of tri-planar motion and the fact that all functional movements

are three-dimensional. However, it is biomechanically understood that description in single plane terms is most useful when generalizing gross movement patterns.

Examples of dominant planes, motions, and axis in gross movements

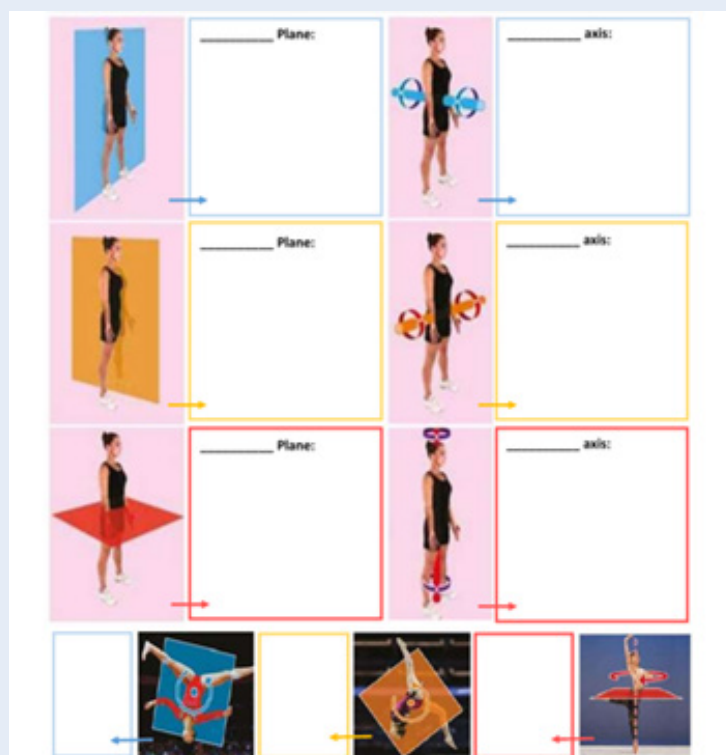
Plane	Motion	Axis	Example
Sagittal	Flexion/extension	Frontal	Walking Squatting Overhead press
Frontal	Abduction/adduction Side flexion Inversion/eversion	Sagittal	Star jump Lateral arm raises Side bending
Transverse	Int-rotation/ ext-rotation Horizontal flexion/extension Supination/pronation	Vertical	Throwing Baseball swing Golf swing

Do you know?

All body movements occur in different planes and around different axes. A plane is an imaginary flat surface running through the body. An axis is an imaginary line at right angles to the plane, about which the body rotates or spins.

Extension Activity

Now identify the plane and axis in the picture below:



Or

Perform front-roll, back-roll, and cartwheel. Write on which plane and axis these movements took place.





Movements	Axis	Planes
Front-roll		
Back-roll		
Cartwheel		

I. Tick the correct options.

1. The term flexion refers to
 - a. bending
 - b. turning
 - c. twisting
 - d. straightening
2. Extension is
 - a. bending
 - b. turning
 - c. twisting
 - d. straightening
3. Moving away from the reference axis is known as
 - a. Flexion
 - b. Extension
 - c. Abduction
 - d. Adduction
4. Bringing the body part closer to the reference axis is called
 - a. Flexion
 - b. Extension
 - c. Abduction
 - d. Adduction
5. The plane which divides the body into a left and a right is called
 - a. Coronal plane
 - b. Sagittal plane
 - c. Vertical plane
 - d. Transvers plane

II. Answer the following questions briefly.

1. What is plane of movement?
2. Which plane and axis is involved while we kick a football.
3. Differentiate between flexion and extension.

III. Answer the following questions in 150-200 words.

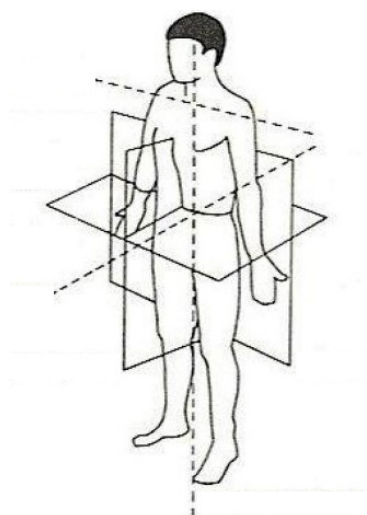
1. Differentiate between abduction and adduction.
2. How does knowledge of movement and its type contribute for graceful movement?

IV. Working in groups, complete the following table on biomechanics and sports.

What is sports biomechanics?	How do we apply biomechanics in sports?	What are the principles of bio-mechanics?	What are the advantages a) for coaches b) for sportspersons

V. Case Study

Fundamentals of kinesiology and Biomechanics in Sports.





On the basis of given picture answer the following questions

- (a) Identify and label the planes and axis
- (b) A vertical plane that divides the body into left and right side is known as _____.
- (c) _____ axis runs from left to right through the centre of the body.
- (d) Sagittal axis is also known as _____ axis.
- (e) _____ plane passes through the middle of the body and divides the body horizontally in the upper and lower half.

VI. Art Integration - Making Powerpoint Presentation

The mechanics of physical activity during dance include all the fundamental movements, which help us in full-body coordination. Keeping in view the importance of fundamental movement, make a PowerPoint presentation on the topic "Fundamental Movements and Dance Moves" and present it in your classroom.

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UNIT 9

PSYCHOLOGY & SPORTS



Content

Definition & Importance of Psychology in Physical Education & Sports;

Developmental Characteristics at Different Stages of Development;

Adolescent Problems & their Management;

Team Cohesion and Sports;

Introduction to Psychological Attributes: Attention, Resilience, Mental Toughness





Learning Outcomes

At the end of the unit, students will be able to:

- Identify the role of Psychology in Physical Education and Sports
- Differentiate characteristics of growth and development at different stages.
- Explain the issues related to adolescent behavior and Team Cohesion in Sports
- Correlate the psychological concepts with the sports and athlete specific situations

Discussion

Read the newspaper clipping given below regarding the role of Sports Psychology in an athlete's performance.

In a First, Psychologist on Tour with India's Women's Hockey Team

BENGALURU: In a much-appreciated move, the Sports Authority of India has assigned a psychologist to travel with the Indian women's hockey team as they head to Spain, and for subsequent matches.

A career in sports can be incredibly stressful, and not just because there's a pressure to perform. Players often experience homesickness, loneliness, the mental effects of incapacitating injuries, and the after tremors and competitive failure, to name a few. Unaddressed, these things could wreak havoc in a player's life.

A psychologist off the pitch can certainly work on improving group dynamics and addressing individual concerns. But a psychologist who's on the pitch can, in chief coach Sjoerd Marjine's words, "analyse how the group dynamics are when we play consecutive matches and how the players react to victory and defeat." This opportunity, which had been missing previously, can now provide a better understanding of the team and what issues to work on.

Discuss in your group

- Think of a sports team from your school/state/country.
- Are they confident of winning, and often win over teams said to be stronger than them?
- Is the team repeatedly making the same mistakes/ losing constantly?
- Are athletes more at risk of mental health issues than the general public? Why/why not?
- Do all athletes have similar problems, or do they differ according to their age or gender?

Based on the news clipping and your discussion above, can you think how a sports psychologist can help improve the performance of athletes?

Present your ideas to the class.

Sportspersons often display different behaviour on the field. Let us consider the following cases.

Case 1: Luis Suarez, an International soccer player, began his career in Europe with Groningen in Holland. In the career of this Barcelona striker there have been three biting incidents on the sports field. The first occurred while he played for Ajax Amsterdam in a game against PSV Eindhoven. Suarez bit midfielder Otman Bakkal. The second incident was when Suarez bit Branislav Ivanovic while playing for Liverpool against Chelsea in 2013. The third incident was when Suarez bit Giorgio Chiellini during the World Cup in Brazil in 2014 while Uruguay played Italy.





In his book, *Crossing the Line*, Suarez attempted to justify the action by saying, “The adrenaline levels in a game can be so high; the pulse is racing and sometimes the brain doesn’t keep up. The pressure mounts and there is no release valve..... I was frustrated because we were drawing what was a very important game, and we were on a bad run. I wanted to do everything right that day, and it felt as though I was doing everything wrong. The pent-up frustration and feeling that it was my fault reached a point where I couldn’t contain it anymore.”

Case 2: MS Dhoni, popularly known as Captain Cool, has always remained composed under pressure and carried India out of delicate situations single-handedly. Whether he was chasing or defending a total in a cricket match, Dhoni, unlike others, was usually seen to be cool and unflappable, concentrating on guiding his teammates to deal with pressure. Unlike the brash aggression of some of the other players, Dhoni did not lose his cool on the field. In an interview Dhoni revealed that he, too, experienced the same emotions as the other players frustration, anger, disappointment, but he rather focused his energy into thinking what should be done. “Whatever the format may be, I get into the process of what can be done now, depending on the situation. In Test cricket, you get a slightly longer duration to chalk out your plan. In one-day cricket, you do have some time constraints and in T20s, everything happens very quickly. So the demands are very different,” Dhoni explained. “I would say I feel equally frustrated, angry and times, disappointed as well. But for me, none of these are very constructive and what is more important for me is that what needs to be done right now, that mostly matters. And once I get into that process of thinking I manage to handle my emotions in a much better way. I am like everyone else, but I tend to control my emotions better than others,” Dhoni added.

Games and sports have always occupied an important place in human life and have flourished in all cultures since times immemorial. However, even a non-trained sportsperson, who is not involved in competitive sports, needs a psychological commitment to participate in regular physical exercise. It is this involvement keeps her/him physically and mentally healthy and helps her/him pursue day-to-day tasks with confidence. This sense of well-being and enhanced confidence provides the intrinsic motivation to the individual to participate in physical activities. Sports psychology not only benefits an individual or a sportsperson but also benefits a group, a mass and the whole society.

9.1.1 DEFINITION AND CONCEPT OF PSYCHOLOGY IN PHYSICAL EDUCATION AND SPORTS

Extension Activity				
Choose any two sports of your interest and complete the table below				
Names of Athletes	Name of the Sports	Region they belong to	International Competitions/ Medals won	Factors that led to their success

Knowledge of psychology helps not just athletes to achieve optimal performance but also addresses the needs, objectives and quality of action to achieve excellence and highest performance in any competition.

Let us first try and understand the meaning of the terms sport and psychology. The term Sport can be described as physical activity for the purposes of recreation, health, competition and education. The term Psychology, on the other hand, is derived from the Greek word psyche meaning soul and logos meaning study. So, psychology was considered as study of soul.

So, psychology was considered as study of soul. This concept was promoted by Greek philosophers under the branch of Philosophy as they believed that the soul was the essence of a person, and it decided how the individual behaved. It was during the late 19th century, that philosophers shifted their interest towards trying to understand how the body is influenced by what is “inside the body” - the mind, and by the events “outside the body” - the environment. They started inquiring about the link between the body and the mind. Psychology, then, came to be explained as a study of the mind.

Later, this description of psychology as ‘a study of mind’ had to be rejected due to lack of observational experiences under controlled conditions. This initiated a new pathway for psychology which is scientific in nature, and includes those behaviours which can be observed and measured. Thus, J.B.Watson explained psychology as a study of observable and overt behaviours that can be measured scientifically. The concept was further challenged after the introduction of computers, which promoted expansion of research opportunity with precision. It led to the new concept of psychology as a study of memory, reasoning, problem solving and other cognitive process. Therefore in the modern context, psychology is a science about “understanding of behaviour and cognitive processes”.





Psychology as a scientific study of behaviour and mental processes has three important aspects to be discussed.

- Firstly, it is scientific in nature; this means it has a scientific approach to acquiring knowledge involving certain key values and standards which are universally accepted and reliable.
- Secondly, it is the study of behaviours which are observable actions and reactions.
- Thirdly, it also includes study of cognitive processes, which involve different aspects of mental life, like memory, reasoning, intelligence, attention etc.

The European Federation of Sports Psychology defines sports psychology as “the study of the psychological basis, processes and effects of sport.”

Sport psychology, therefore, is an interdisciplinary science that draws on knowledge from the fields of Kinesiology (the scientific study of movement) and Psychology. It includes the study of the manner in which psychological factors affect performance and the way in which participation in sport and exercise affect psychological and physical factors. Sport psychology is used for team sports as well as individual fitness endeavours.

It was in 1925 that Coleman Griffith, often called the “Father of Sports Psychology” in North America, set up the Athletic Research Laboratory at the University of Illinois. The field of Sports Psychology became an area of proficiency that uses psychological knowledge and skills to address performance and well-being of athletes, developmental and social aspects of sports participation, and systemic issues associated with sports settings and organizations. Sports Psychology is the study of psychological factors that affect the learning and performance of motor skills. Due to its important role in the enhancement of performance in the sports field, it is necessary for us to understand the broader meaning and scope of Sports Psychology.

Do you know?

American Psychology Association in 1986 created a new division for Sports Psychology referred as Div.47. According to APA the field of sports psychology focusses on two main areas:

- a. helping athletes use psychological principles to achieve optimal mental health and to improve performance (performance enhancement).
- b. understanding how participation in sport, exercise and physical activity affects an individual’s psychological development, health and well-being throughout the lifespan.

Exercise and Sports Psychology is the scientific study of the psychological factors that are associated with participation and performance in sport, exercise, and other types of physical activity.



APA (2009)

A field of study in which the principles of psychology are applied in a sports setting.

R Cox (2007)

Sports Psychology is concerned with the psychological foundations, processes and consequences of the psychological regulation of sports related activities of one or several persons acting as the subject(s) of the activity.

Richard. H. Cox (2012)



Sports and exercise psychology is the scientific study of people and their behaviours in sports and exercise activities and the practical application of that knowledge.

Weinberg and Gould (2011)

9.1.3 APPLICATION OF PSYCHOLOGY IN PHYSICAL EDUCATION AND SPORTS

Many strategies and procedures are used to address problems faced by athletes and other sports participants. Some of the applications of psychological concepts and theories in physical education and sports are:

Cognitive and behavioural skills training for performance enhancement

Counselling and clinical interventions

Consultation and training

1. Cognitive and behavioural skills training for performance enhancement include
 - Concentration and attention control strategies
 - Goal setting



- Imagery Training
- Cognitive-behavioural self-regulation techniques
- 2. Counselling and clinical interventions include support for managing:
 - Athletic motivation
 - Over-training and burnout
 - Eating disorders and weight management
 - Substance abuse
 - Grief, depression, loss and suicide
 - Sexual identity issues
 - Aggression and violence
 - Athletic injury and rehabilitation
 - Career transitions and identity crises.
- 3. Consultation and training include
 - Team building programmes for sports teams and organisations.
 - Sports organization consultations for behaviour economics
 - Systems interventions with parents and families involved in youth sports participation
 - Education of Physical Educators, Coaches and Trainers regarding role of interpersonal and leadership skills for talent development
 - Education of Physical Education and sports professionals towards early identification and prevention of psychological difficulties.

9.1.5 IMPORTANCE OF PSYCHOLOGY IN SPORTS AND EXERCISE

A. Benefits of Exercise and Physical Activity:

- i. **Cognitive Aspect:** The benefits of physical activity go beyond health and wellness of the body. Research suggests that physical activity positively impacts the brain and improves cognition, mood, attention, problem-solving abilities, strategic planning and academic achievement in students.
- ii. **Emotional Aspect:** Physical Activity provides positive feelings and counters negative mood state, depression and anxiety because of increased engagement in recreational, health-related and competitive activities. Sports psychology enhances physiological capacities such as strength, speed, flexibility, etc. as motivation plays a major role in the enhancement of the physical capacity of sportspersons. Acute bouts or



short duration of exercise are also beneficial, but chronic or regular exercise is required for maintaining long term benefits.

Extension Activity

Choose a sport or activity in which you regularly participate. Explain the motivational forces that have driven you when you have achieved your best.

Are the motivators you chose the same as for all your class mates? Why/ why not?

Think of times when you have been anxious and nervous when facing a challenge. What strategies did you employ to overcome your anxiety? Do you think athletes utilize similar strategies? Why/why not?

Share your ideas with the class.

- iii. **Social Interaction:** Exercise as an activity provides opportunity for people to participate in both group as well as individual exercise programmes. e.g., participating in a team event, group exercise programme or an individual activity in a social structure. Group Exercise experience is pleasurable for participants; hence it is good for mental health and social wellbeing. However, choice of individual exercise is preferable and beneficial for people low with self-esteem or for those suffering from anxiety related to body image and physical self-concept. In addition, spectators and fans at a match or sports activity also bond socially.
- iv. **Distraction Ability:** Exercise provides opportunity for distraction from the current mood state. Acute dose or short duration of exercise is helpful in reducing anxiety through the distraction ability of exercise; regular exercise has long term benefits.

B. Psychological Advantages of Sports Participation

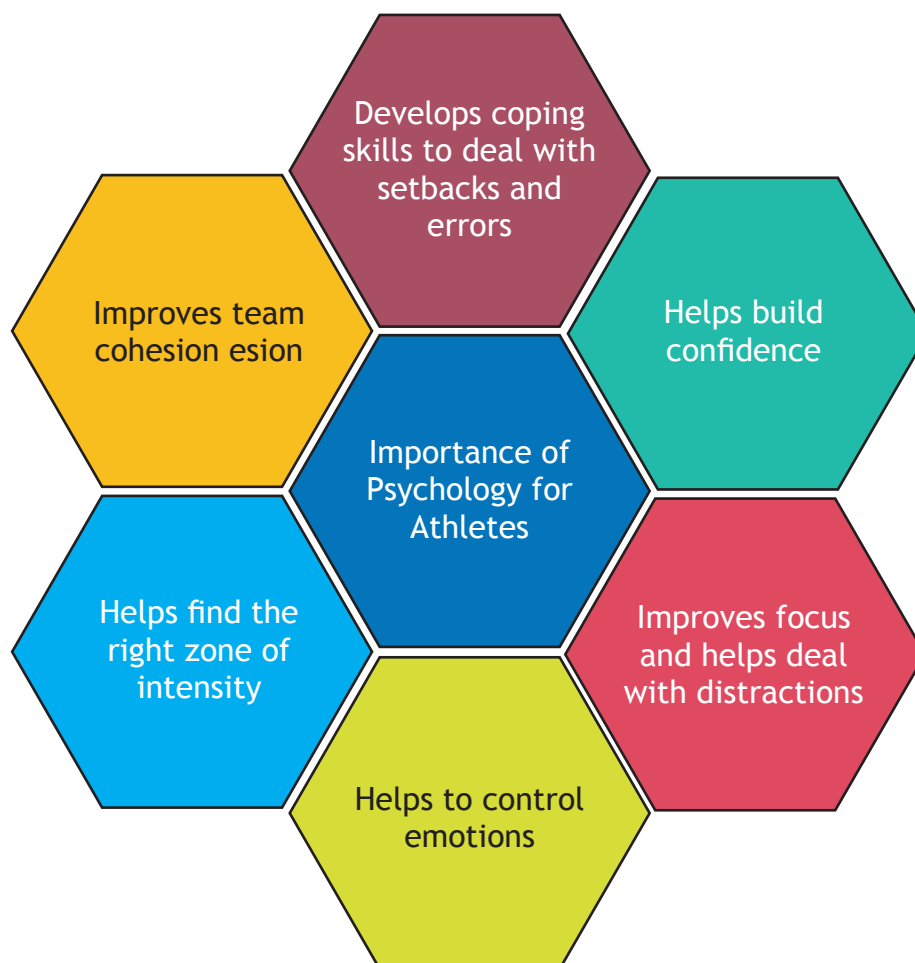
- i. **Life skills:** Sports participation and competitions help to develop sense, sensitivity and sensibility among participants which helps them to approach and tackle the issues and challenges of life with positivity.
- ii. **Developmental aspects:** Sports participation experience provides opportunity among the participants to develop social relationships including making friends and enjoying team atmosphere; it also helps in developing a spirit of healthy competition.





- iii. **Behaviour modifications:** Sports participation increases perceived competence and self-efficacy. Positive sports experience enhances intrinsic motivation
- iv. **Cognitive and Motor Skill acquisition:** Repeated training and playing sports helps in:
 - ◆ improving attention deficit disorder
 - ◆ developing memory
 - ◆ developing reasoning ability
 - ◆ developing decision making skills

C. Performance enhancement of athletes through sports psychology



D. Exercise adherence through psychological interventions

Regular exercise is an essential component for a healthier lifestyle and the concept of following a culture of exercise and physical activity throughout life is appreciated uniformly across the world. However, there may be still a large population whose exercise level must be low or some of those who have begun exercise, but may not continue for long, and many who may lose steam in



between. Psychological theories and research understand the determinants of exercise adherence and non-adherence to help participants maintain a lifelong commitment to regular exercise, and may also be used to identify potential drop outs.

I. Tick the correct option.

1. Psychology as study of behaviour was defined by
 - i. JB Watson
 - ii. Plato
 - iii. Skinner
 - iv. Pavlov
2. Who known as father of experimental psychology?
 - i. Wilhelm Wundt
 - ii. John B Watson
 - iii. Richard H Cox
 - iv. Sigmund Freud

II. Answer the following questions briefly.

1. Define psychology?
2. Define sports psychology?

III. Answer the following questions in 150-200 words.

1. In what ways could knowledge of sports psychology benefit athletes?

9.2.1 DEVELOPMENTAL CHARACTERISTICS OF GROWTH AND DEVELOPMENT

Growth and development are multidimensional requiring integration and coordination between the various aspects. To understand the growth and development of an individual, it is helpful to understand the four main areas of development.



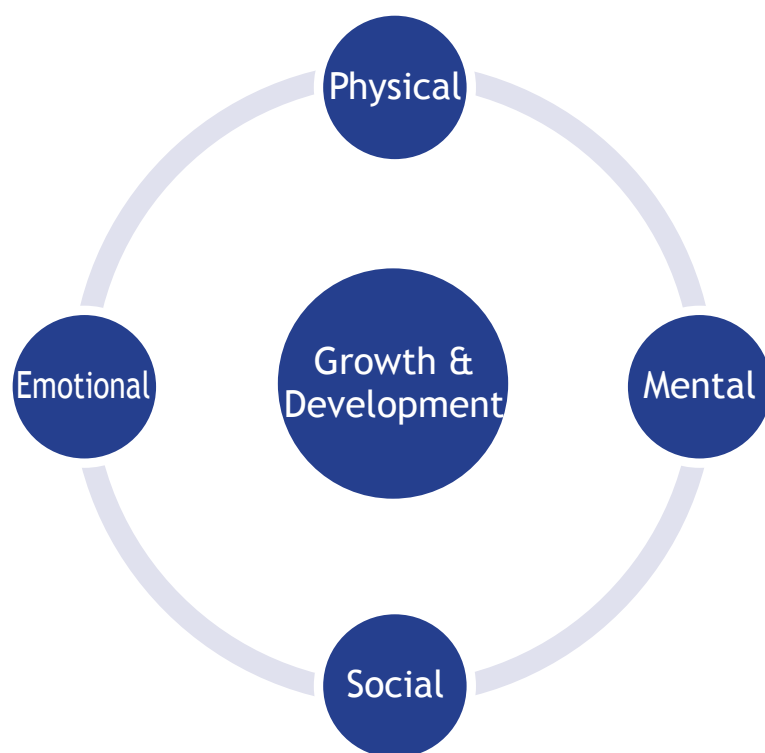


Figure-1: Schematic illustration of the interaction between the four main areas of development

S. No.	Areas of Growth and Development	Characteristics
1.	Physical	height and weight
2.	Mental	thinking and understanding
3.	Social	interacting with others
4.	Emotional	feelings and attitudes

As is illustrated in Figure 1, the overall development of an individual is influenced by a constant interaction between the four areas of development. Growth and development of an individual is the result of interaction between physical, mental, emotional as well as social aspects of development.

What is physical development? Development of physical aspects includes of the various physiological changes occurring to an individual starting from birth till death. Measurement and assessment of physical aspects of development includes factors such as height, weight, strength, flexibility and other motor abilities. Changes in body composition due to change in age influences various other aspects of development. Most of the physical developments are quantifiable and measurable in terms of size, shape and weight, therefore have standard tools to assess them.

What is cognitive development?

Cognitive, or its extended term mental development, is an essential aspect of an individual's development. It includes abilities such as memory, perception, language,



information processing, and thinking which influence decision-making abilities. According to change in biological age, these abilities keep changing along with growth and maturation. There is a general pattern of mental development, but each individual develops their mental abilities in a unique pattern which is influenced by genetic factors, social environment and experience available to an individual during different stages of growth. The important aspect about cognitive aspect is that, all the abilities are inter-related and they develop as a unit.

What is social development?

Social development refers to the aspects wherein an individual interacts with the society and which results in development in various aspects of an individual at different stages of life. Social development is also the ability to communicate effectively with the members of the society and to observe societal norms of the community according to one's age group.

What is emotional development?

Emotion refers to responses consisting of physiological reactions and expressive behaviours which may be subjective in nature. Emotional development is part of a person's personality development and it refers to the ability to express and control one's emotions. It includes control over psycho-physiological reactions of the body with respect to the conditions, environment and situations surrounding them. From childhood to old-age, individuals acquire new skills to manage feelings and emotions as it is highly affected by the environment and conditions around an individual. A wide variety of emotions are expressed by individuals at different stages of growth and display. Age and gender along with quality of emotional experiences are major factors affecting the emotional decisions an individual.

9.2.2 STAGES OF GROWTH AND DEVELOPMENT

Change is the one inevitable thing in life. Change could be visible, as in physical aspects, involving weight, height gain or muscle and fat mass reduction and increase etc., or it could be related to cognitive abilities, i.e., the ability to understand, the emotional ability to respond to different stimuli, or the ability related to social aspects and the capability to choose groups and individuals, or the ability to evaluate the moral aspects and to value and respect people and happenings with rationale regarding ethical and moral principles. These changes are commonly described according to various stages of development based on different age groups. If we observe the behaviour of people living around us, we see they are not similar in their behaviour. Most of the changes or differences are because everyone is in different stages of development. The developmental stages are considered to be temporary and consist of characteristics which are dominant at a particular stage. Individuals





differ with respect to time and rate of development, but they are expected to attain these developments within their stages. Thus, these accomplishments become social expectations which are known as developmental milestones.

From the perspective of physical education and sports, these changes influence participation and performance in physical activities, exercise and sports. Therefore, a detailed understanding of the changes which occur at different age groups or different stages of growth and development is very essential and critical for optimal growth and development of an individual.

While there is no consensus in classification of different stages of growth and development, broadly speaking, the stages of human life span can be divided into:

- Infancy (birth to age 2)
- Childhood (2-11 years)
 - ◆ Early childhood (2 to 6years)
 - ◆ Middle childhood (6 to 11years)
- Adolescence (11 years to about 20 years)
- Adulthood (20 -65 years)
 - ◆ Young Adulthood (20 to 40 years)
 - ◆ Middle Adulthood (40 to 65 years)
 - ◆ Late Adulthood (65 years and above)

Stages	Developmental milestones
Infancy : 0-2 yrs	<p>Physical: The child's body weight increases to almost triple the birth weight, and increase in height is about one-third during the first year alone. Growth of brain size is also rapid during first 18 months.</p> <p>Linguistics: Children start developing language ability and learn through their sense organs. They explore the world in their own ways and express their intellect by making various sounds like gurgling, cooing, etc.</p> <p>Social & Emotional: Expressing joy, anger, sadness is achieved by 6 months.</p> <p>Motor skills: The infant first controls his head and trunk, then lifts his chest, sits upright, crawls, creeps, stands with help, stands holding some objects and starts walking.</p>



Early Childhood: 2-6yrs	<p>Physical: The child develops athletic appearance and loses baby chubbiness. Brain and head grows rapidly during this period.</p> <p>Cognitive: The child develops ability to classify objects, people or events. They are imaginative, animated and create their own hypothetical world.</p> <p>Psycho Social: He/She is able to express his/her feelings and emotions and communicate needs and feelings with others.</p> <p>Linguistic: The child develops the ability to speak in complete sentences.</p> <p>Motor skills: The child has better control of his/her physical movement and can have better coordination of body parts.</p>
Late Childhood (Pre-Adolescence) 6-11yrs	<p>Physical: There is an increase in strength as body parts become stronger.</p> <p>Cognitive: By this age children develop concrete thinking abilities, in which they develop ability to think logically and use mental operations to solve problems. However, they still lack abstract thinking ability.</p> <p>Psycho Social: The child develops gender identification and social comparison to identify themselves from others.</p> <p>Motor skills: They have developed the ability to use body parts with appropriate speed.</p>
Adolescence (11-20 years)	<p>Physical: Boys and girls develop height, weight, muscles and achieve maturity but in growth is in spurts. The onset of this stage is marked by the onset of puberty.</p> <p>Psycho Social: At this stage boys and girls are argumentative and they have a tendency to find fault with the authority figures. They are self- conscious and influenced by their peer group.</p> <p>Cognitive: Boys and girls become innovative and take great interest in learning various skills. They also develop the ability of abstract thinking.</p> <p>Motor skills: They develop strength, speed, endurance, flexibility, coordination at a rapid rate.</p>
Early Adulthood (20 -40 years)	<p>By the time they reach adulthood, individuals are responsible, mature, self-supporting and well-integrated into society.</p>





Middle Adulthood (40-65 years)	This period is characterised by strong social networking, relatively stable personality, and life is dominated by work and family.
Old Age (65 and above)	This period is marked by decline of health and faculties, and individuals often plan to retire. It is marked by inactiveness and people are prone to various physical limitations.

Developmental Characteristics and Stages of Growth and Development: A Sports Model

In sports, an athlete's growth and development at different stages of life is an essential component to be considered while planning training, selection of activity, grouping of athletes according to abilities etc.

The growth and development stages of athletes can be grouped into four categories:

- below 9 years Fun Phase
- 10-12 years Foundation Phase
- 13-15 years Formative Phase
- 16-19 years Final Phase

By identifying and understanding the main characteristics of each of these developmental stages, athletes' needs can be better taken care off.

Key Features

Fun Phase: Below 9

Elements	Physical	Motor Skill	Cognitive	Psycho-social
Characteristics	Slow but steady increase in height and weight	Learns basic motor skills	Short attention span.	Sensitive to criticism
Teaching/ Coaching Pedagogy	Add minimal physical conditioning	Plan fun-oriented activities to develop motor skills	Add variation and variety in drills	Create stress free atmosphere

Foundation Phase: 10-12 years

Elements	Physical	Motor Skill	Cognitive	Psycho-social
Characteristics	Growth spurt and changes due to puberty	Motor skill development at different rate	Increased perception and Logical	<ul style="list-style-type: none"> • High Self-Confidence • Tendency to self-evaluate and compare oneself with others
Teaching/ Coaching Pedagogy	Plan low intensity physical conditioning	Focus on skill refinement and development	Introduction of Small Sided Games (SSG); Allow guided discovery	Avoid winning and losing; Give positive feed backs

Formative Phase: 13-15 Years

Elements	Physical	Motor Skill	Cognitive	Psycho-social
Characteristics	Physical and hormonal changes	Increase in adaptation	Development of ability for abstract thinking	<ul style="list-style-type: none"> • Sensitive to peer pressure • High level of criticism • Self-centred
Teaching/ Coaching Pedagogy	Plan Training at match speed Add fitness component	<ul style="list-style-type: none"> • Practise in Real match situations • Add tactics and strategy 	Schedule long and intense playing hours	Allow increased decision making





Final Phase : 16-19 Years

Elements	Physical	Motor Skill	Cognitive	Psycho-social
Characteristics	All round development (Automatic capacity). Specified gym drills prerequisite	Autonomic phase of skills acquisition	Abstract reasoning skills	<ul style="list-style-type: none">Emotional autonomyAble to take positives/negatives
Teaching/ Coaching Pedagogy	Prepare for High intensity match-related drills	Develop Motor perceptual abilities; Develop tactical and actual game scenarios.	Involve and allow decision making during scheduling of training	Assign Individual roles and responsibilities

The phases may differ slightly between males and females as females tend to mature more quickly than males, thus reaching adolescence at an earlier age.

I. Tick the correct option.

1. Infancy stage is for the age group
 - i. 0-2 years
 - ii. 2-6 years
 - iii. 6-11 years
 - iv. 11-20 years
2. Change in memory and perception are indicators of
 - i. social development
 - ii. physical development
 - iii. mental development
 - iv. emotional development
3. Peer interaction and relationship reflects
 - i. group dynamics
 - ii. physical growth
 - iii. moral values
 - iv. emotional development



II. Answer the following questions briefly.

1. Define concepts of Growth and Development?
2. Explain characteristics of Growth and Development?
3. Which type of activities can be undertaken in early childhood? Why?

III. Answer the following questions in 150-200 words.

1. Discuss the developmental characteristics of early childhood and their impact on learning.

9.3.1 ADOLESCENT PROBLEMS AND THEIR MANAGEMENT

Adolescence as defined by WHO includes individuals between the age group of 10-19 years, a period of transition from childhood to adulthood. It is marked by the onset of puberty, which now occurs earlier, on an average, than in the past. This age group is considered critical because it marks the developmental transition of an individual from childhood to adulthood, which involves physical, psychological, social and neuro- developmental changes.

Raman is a 14-year-old who has just entered Class 9 in his Secondary School. He has noticed that his body is going through some physical changes. As a result, he has become self-conscious about his physical appearance. He has also begun taking measures to insure more privacy at home. For example, he locks the door every time he enters the bathroom, and he always takes his phone calls in his room with his door closed. He also values his relationships with his friends and has begun spending more time with them. He has started valuing his freedom, thus gets aggressive or irritated with restrictions by family members on certain tasks. His parents understand the behaviour changes, thus creating space for him at home and listening to his thoughts and ideas. They involve him in sports and outdoor activities to channelize his energy. Raman's behaviour and physical changes are common during adolescence.

Adolescence stage is a critical time of life, when a child transforms into an independent individual, develops new relationships, enhance social skills and acquires behaviours which will be everlasting throughout life. Due to these various changes, adolescents need explicit attention and support to help them contribute positively to society.

Physical growth and development during adolescence is marked by changes in height and weight, body composition, skeletal mass, and sexual maturation. The biological changes during adolescence that occur due to the onset of puberty, mark the transition of the child into an adult. The growth spurt associated with puberty, which results in physical and hormonal changes is also marked by remarkable changes in energy levels, thus developing in the individual a strong recognition of personal identity,





moral and ethical value sets, and a feeling of self-esteem. The hormonal changes are linked to the cognitive and psycho-social changes, wherein adolescents develop stronger reasoning skills, logical and moral thinking, and become more capable of abstract thinking and making rational judgements. This stage of adolescence surely creates opportunities for significant developments because of wide chronological age range, but it also creates space for dissatisfactions too, thus creating turbulence in the adolescent which can be reflected in behavioural as well as emotional aspects. They are exposed to a variety of substance abuse like tobacco, drugs etc. They face greater risk of violence and can experience different types of emotional drainage leading to depression and suicide tendencies.

Do you know?

Adolescent health

Coming of age: adolescent health



24 September 2018 -- The world now has more young people than ever before -- of the 7.2 billion people worldwide, over 3 billion are younger than 25 years, making up 42% of the world population. Around 1.2 billion of these young people are adolescents aged between 10 and 19 years. Adolescence is a critical time of life. It is a time when people become independent individuals, forge new relationships, develop social skills and learn behaviours that will last the rest of their lives. It can also be one of the most challenging periods. "Coming of age" examines these issues facing adolescents.

Read "Coming of age"



Extension Activity

Answer the following questions:

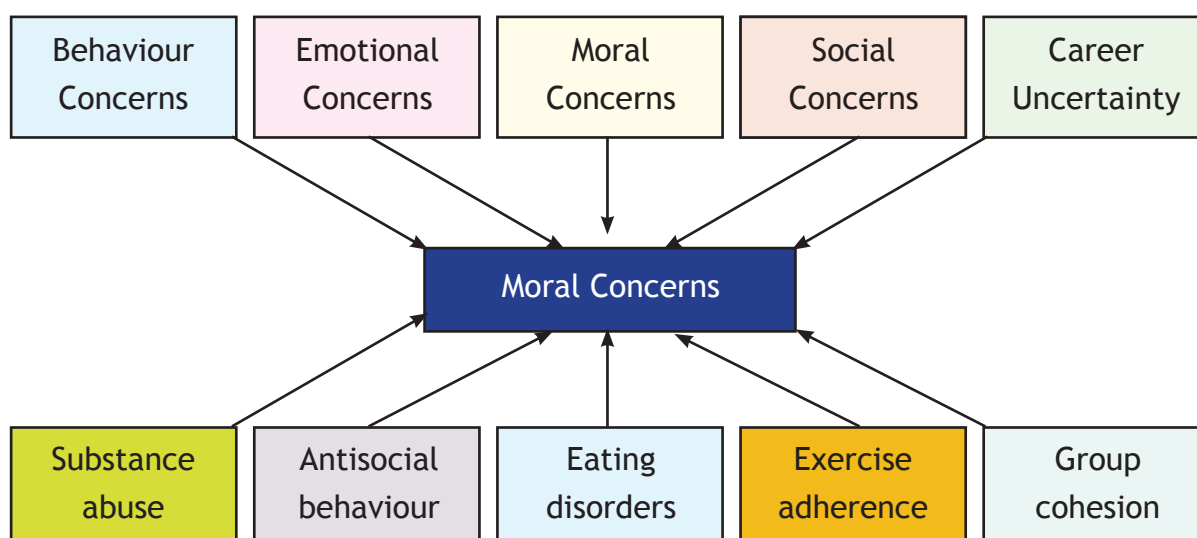
- How important is it for you to be accepted by your peers?
- What are some situations in which you have, or someone you know has, experienced peer pressure?
- Why do you think it's so difficult to withstand peer pressure?
- What would you do if one of your friends began pressuring you to do something you didn't want to do, or didn't approve?
- If someone were consistently trying to pressure you to do something you were uncomfortable with, would you consider that person a friend? Why or why not?
- Why do you think peer pressure is so often associated with negative behaviour?
- What are some ways to avoid negative peer pressure?
- Is there positive peer pressure?
- What are the ways in which friends could have a positive influence? Share your views with the class.

Early Adolescence (10-14 yrs) is the initial stage wherein a child like Raman starts adjusting to the rapid body changes and adapts to sexual changes. This stage is very suitable for cognitive development, the child develops concrete thinking, and an ability to understand the perspective other than their own. They also fall short of problem-solving skills related to behaviour modifications. They develop early moral concepts about there being just no one right view, instead there can be different opinions regarding similar concerns. At this stage, a strong peer influence is also reflected through development of relationships among peer group/ friends and admiring celebrities.

Middle adolescence (14-17 yrs) is the stage wherein puberty has passed, thus creating a consciousness in the adolescents about their physical appearance and sexual attractiveness. This stage is very critical, as it establishes emotional separation from the parents and a desire for being independent and need for space. This period is also marked by development of abstract thinking, ability to use verbal communication effectively, and development of conventional morality. With the development of conventional morals, importance of peer pressure and peer acceptance and approval increases. They start focusing on maintaining social order but will surely like to match their behaviour with their beliefs by trying the things which they consider as “undesirable”. Due to this, individuals in this age group are prone to engage in social problems including addiction to smoking, drug abuse and other health-risk behaviours.

Late adolescence (17-19 yrs) is the stage where the adolescent develops a personal sense of identity as the biological development concludes for most. Thus, he/she is now better able to cope with situations of peer group pressure, body imaging and behaviour impulses. They move on from concrete thinking to abstract thinking which prompts them to set their own moral guidelines without any need for social acceptance. This stage is also marked by increased behaviour control, consistency and stability leading to creating space for themselves within the society.

Adolescence Problems





Adolescence problems: When various problems like behaviour issues, emotional problems, moral dilemmas, social concerns along with career uncertainty combine together, they create behaviour deviations among the adolescents and raise concerns and problems among the society members at home, at school, in the sports teams etc. These behaviour deviations lead to problems such as substance abuse which have negative effects on health, developing of eating disorders leading to anorexia nervosa or bulimia nervosa, indulging in anti-social behaviour due to aggression and anxiety, non-adherence to outdoor activity, sports and exercise. The various types of concerns associated with adolescence at different stages are to be understood and supported by family, friends, teachers, coaches, relatives in accordance to the needs and demands of the individual. Any deviation in any of the mentioned aspects of the adolescent leads to different types of problems which need appropriate understanding and management.

The problems associated with adolescence due to behaviour deviations can be many, but a few major issues along with their management are discussed below.

1. **Substance abuse** is one of the major concerns among the adolescence. It is behaviour that is neither ethical nor socially acceptable. Drugs have addictive properties, and have lethal effects on health. Alcoholism, smoking, drugs etc attract the adolescence age group due to peer pressure and various other factors.

Management: The issues related to intervention include a combination of cognitive and behaviour techniques.

- The cognitive techniques include expression of concern for individuals by coaches and parents, setting limits on unacceptable behaviour and developing behaviour policies for class, team or group.
- The behaviour techniques include involvement of peer for transfer of accepted behaviours, engagement of individuals during free time through participation in sports, exercise, recreation or any outdoor or indoor activities for constructive modification.

2. **Eating Disorders** are the result of various psychological aspects like anxiety, depression etc. due to which the adolescent develops eating disorders like

- (a) Anorexia nervosa which is reflected in bizarre eating patterns and habits like unusual starvation due to social or physique anxiety for weight loss.
- (b) Bulimia Nervosa which is presented by binge eating patterns due to depression and other psychological fluctuations.

Eating disorders can be found among addicted exercisers when they stop exercising, start dieting and develop anorexia or bulimia due to depression, especially in females, who develop consciousness towards physical appearance.



Management: These issues concerned with eating disorders can be managed through two essential processes

- **Diet Awareness** is essential towards management of eating disorders. It can be done through promotion of awareness about dietary habits among the adolescents at various levels including at school, home, residential organizations and at community events involving adolescents.
- **Promotion of Fitness:** Physique and physical appearance have no substitute other than exercise and physical activity along with a healthy diet pattern. Promotion of fitness activities and participation in sports or outdoor activities need to be facilitated at all levels of community interaction opportunities.

3. **Anti-Social Behaviour** is a prominent pattern reflected among the adolescents due to the psychological turbulence happening along with sudden spurts of physical changes during adolescence when not adequately supported by the community and associated members. Issues of aggression have a larger impact on the adolescent due to change in cognitive abilities.

Management:

Catharsis: Aggression can be regulated through fulfilment or discharge of negative feelings, or catharsis. Individuals should be given an opportunity to speak and express their emotions, as suppressing of emotions and provision of opportunities for adolescents to share their thoughts along with their peer group.

Circular Effect: Aggression has a circular effect, as one act of aggression leads to another. Therefore, there is a need to break the circle so that it is not repeated again. Ideal recommended style to break the circle is through positive reinforcement.

Management:

- Break the violence cycle as soon as frustration is reflected i.e., aggressive behaviour of seniors is reflected on juniors or of one player on another.
 - Provide space for players to speak and express their opinion and the manager/coach must listen to it positively.
4. **Exercise Adherence:** With the growth in physical aspects and development in social, mental, cognitive aspects in adolescence, energy channelization is essential for cohesive development. Participation in outdoor and indoor activity along with participation in sports and exercise is essential for lifelong learning towards wellness. Dropout rate from participation of sports and exercise is a





common reflection among the adolescence. The general reasons identified for the dropouts are:

(a) Intrapersonal Constraints:

- i. Lack of fun and enjoyment or getting bored;
- ii. Low perceptions of physical competence;
- iii. Low intrinsic motivation and high stress level;
- iv. Negative feelings towards team or coach;
- v. Anxiety and nervousness due to excessive criticism.

(b) Interpersonal Constraints:

- i. Family or peer pressure;
- ii. Social priorities;
- iii. Excessive alternate opportunities;

(c) Structural Constraints:

- i. Time available for training;
- ii. Sports related injuries;
- iii. Financial feasibility;
- iv. Insufficient facilities and infrastructure;
- v. Overuse/Burnout;

Adherence Management: Support of family, teachers, coaches, trainers is essential towards helping adolescence towards exercise adherence as an essential component towards life.

Adoption	Maintenance
<ul style="list-style-type: none">• Access to facility and time• Self-motivation• Social influence• Self-efficacy• Behaviour coping skills	<ul style="list-style-type: none">• Knowledge about importance of healthy life style, exercise and sports• Positive attitude towards exercise and sports• Confidence to succeed in vigorous exercise Programme/sport



I. Tick the correct option.

1. Rajita regularly binges on large meals. She then makes herself vomit and follows up with two hours of exercise. Rajita is most likely suffering from which eating disorder?
 - i. Toxaemia
 - ii. Obesity
 - iii. Bulimia nervosa
 - iv. Anorexia nervosa
2. Which of the following is the age group for Early Adolescence?
 - i. 6-9 yrs
 - ii. 10-14 yrs
 - iii. 14-17 yrs
 - iv. 17-19 yrs
3. Which one of the following is NOT a problem related to adolescence
 - i. Eating Disorder
 - ii. Substance Abuse
 - iii. Anti Social Behaviour
 - iv. Lack of Language development

II. Answer the following questions briefly.

1. Define Adolescence as per WHO?
2. Explain the different stages of adolescence?
3. List some of the problems of adolescence.

III. Answer the following questions briefly.

1. Describe various adolescence problems? How can they be managed?

9.4 Team Cohesion and Sports

As a social psychological topic, team cohesion ranks as a very important factor for enhancing team performance and feelings of satisfaction among members. Let's try to understand about the terms Group and Team along with the term 'cohesion'.

Group can be defined as 'two or more persons who interact with one another such that each person influences and is influenced by each other person'. A team is more than just a group. The term 'team' can be defined as 'a small number of people





with complementary skills who are committed to a common purpose, common performance goals, and an approach for which they hold themselves mutually accountable’.

When we refer to a ‘team’ in sport psychology we are also referring to a group of people who play together and have a powerful influence on each other. For this reason, the terms group and team are sometimes used interchangeably. Group cohesion can be defined as “a dynamic process which is reflected in the tendency for a team to stick together and remain united in the pursuit of goals and objectives”. Because a sports team is a group, definition of group cohesion can be applied equally well as a definition for team cohesion. Fundamental to the study of team cohesion is the understanding of group dynamics. Members of a team or group begin to interact with each other the moment the group is first formed. Once a group is formed, it ceases to interact with outside forces in the same manner that a collection of individuals would. The team becomes an entity in and of itself.

The word cohesion literally means sticking together. Thus, team cohesion is the sum of the forces that influence members to remain part of a group or team. A highly cohesive team is likely to be more united and committed to success than a team low in cohesion. It is often said that a team is more than just the sum of the individual players. This is because the cohesiveness of a team can be just as important as the talent of individual team members. If you are a follower of football or cricket, you might have noticed that, in certain seasons, teams composed of brilliant individual performers collectively underperform. This is probably due to the fact that the team members have somehow failed to ‘gel’ together. This is an example of lack of team cohesion.

Team Cohesion in sports: Team cohesion is a multidimensional construct that includes both Task Cohesion and Social Cohesion. In sports when team cohesion is to be developed, coaches need to differentiate between task cohesion and social cohesion. Task and Social cohesion are two independent components of team cohesion and failure to differentiate between the two can lead to failure in developing team cohesion among the teams. Task cohesion refers to the level of team members working together to attain and achieve common and identifiable team goals in a cohesive environment. Social Cohesion refers to the level of liking among the team members and amount of personal satisfaction of being together in as team members. Group orientation of each team may differ in their task and social cohesiveness, therefore its essential to understand the team cohesion in a more comprehensive way to help sports teams to remain united in the pursuit of goals and objectives.

Group Cohesion: Belonging to a peer group is a key need for an adolescent, which



can be dynamic in both structure as well as process. Group cohesiveness and its norms help to facilitate the group to achieve more than individuals would be able to on their own. The purpose of a group is towards bringing a change along with providing support and insight into either the individual, the group as a whole, or the environment. Working in groups may well encounter internal problems and conflict at certain stages, but with effecting group functioning strategies, they provide a positive and supportive environment to develop and learn new interpersonal skills. Teams are special kinds of groups, members of teams often have complementary skills and are committed to a common goal or purpose and they are mutually accountable for their activities. In teams, there is a positive synergy attained through the coordinated efforts of the members.

Group Management:

a. Goal Setting

- i. Set teams goals and take pride in their accomplishment.
- ii. Each player must be aware of their roles and make them believe it is important
- iii. Take time to learn something personal about an individual

b. Avoid formation of cliques

- i. Promote regular meetings and interactions
- ii. Positive encouragement on losing and avoiding public punishment
- iii. Avoid personal prejudice or scape goats usage
- iv. Provide equal opportunity
- v. Focus on maximum transparency
- vi. Develop team drills and activities to promote team cooperation
- vii. Highlight areas of success even during failure.

Determinants of Team Cohesion

There are various factors which decisively affects the team cohesion among sports teams. While developing team cohesion in sports among the team members, several elements have been identified that determine conditions for setting high level of team cohesion. Below are list of few determinants of team cohesion in sports, which can be classified into personal factors, teams factors, leadership factors and environmental factors.

1. Personal factors





- Satisfaction
- Similarity of experience

2. Team factors

- Prior success
- Communication
- Having team goals
- Importance of achieving goals

3. Leadership factors

- Effort to develop cohesion

4. Environmental factors

- Size of group

Benefits of Team cohesion

The consequences or benefits of high level of team cohesion in sports can be observed for team as a group outcome as well as for individual athletes. Improved team cohesion do help individual athletes to give their optimal performance and it also helps team as a group to stay unified in a cohesive environment while attaining team goals and objectives. Let's discuss the benefits of team cohesion from the perspective of group outcome as well as individual outcomes.

1. Group outcomes

- Team stability : Research reveal that when athletes reflect high level of social cohesion in sports teams, there is high possibility of their continuation in sports in future season. Therefore, social cohesion is a strong predictor of athletes intension to continue with sports team involved and improve team stability.
- Team Efficacy: Group cohesion helps teams to believe in their abilities and develop self-confidence among team members, leading to improved level of group or team efficacy. Team efficacy helps teams, and its members to believe that that can be successful.

2. Individual outcomes

- Improved Athletic Performance: Team Cohesion in sports has a strong association with improved athlete performance. When athletes as associated with common and identifiable team goals (task cohesion), their individual performance of athletes within the team is enhanced.



- **Perceived Psychological Momentum:** Sports team having high level of team cohesion and have increased task cohesion are more likely to enjoy the benefits of psychological momentum. Team cohesion helps athletes during competition and contests to develop a perception about momentum of competition to be in their favor.
- **Enhanced mood, emotion, and satisfaction:** Improved team cohesion reflect increases positive emotions and greater self-satisfaction among athletes. Athletes part of highly cohesive sports team enjoy positive mood compared to athletes associated with less cohesive teams.

I. Tick the correct option.

1. Which of the following is considered as characteristic of team cohesion?
 - i. Members seeing themselves as one rather than collection of individuals.
 - ii. Members of group having their own objectives
 - iii. Members hold hidden agenda
2. The main objective of Team Cohesion is to ?
 - i. Work independently
 - ii. Cooperate and work together to accomplish common goals
 - iii. Criticize other group.
3. Which of the term describes the level to which group members work together towards a common and identifiable objectives of a team?
 - i. Group Respect
 - ii. Task Cohesion
 - iii. Social Cohesion
 - iv. Group Respect

II. Answer the following questions briefly.

1. Define Group and its characteristics ?
2. Describe the benefits of Team Cohesion?
3. Explain the determinants of Team Cohesion?

III. Answer the following questions in 150-200 words.





1. How important is for a sports team to develop Team Cohesion.
2. Discuss a plan to develop team cohesion among team members?

9.5 Introduction to Psychological Attributes

9.5.1 Attention

The term attention and various concepts related to attention are very common in the arena of sports and athletes do consider it important for performance. Attention is about taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or train of thoughts. It implies withdrawal from some things in order to deal effectively with others. In sport, nothing can be more important than paying attention to the object at hand. On the surface, the idea of paying attention seems simple enough, but psychologists have long recognized that the attention process can be very complex. Attention in sports describes the focusing of his or her own role in relation to other teammates, set of situations, particular stimulus on the play field and its often accompanied by an increase in readiness to receive and respond to the situation involved. Inability to do so may lead to effect performance even by the athletes with highest skill sets and abilities. For athletes, state of attention may be produced initially in many ways, including as a conscious, intentional decision, as a normal function of social interaction, or as a reaction to an unexpected event. Attention can more broadly defined as the concentration of mental effort on sensory or mental events, thus attention focus on addressing to relevant environmental cues and elimination of irrelevant cues.

In sports, the theory of all-or-none phenomenon which means either you concentrate or you don't is not relevant anymore. It is interesting to understand that there are various types of attention focus and each type has specific utility for specific sports, this is referred as attention styles. The attention styles can be classified of four types which is divided as per two independent dimensions i.e. 'direction' and 'width'. Attention style as per width can be narrow attention or broad attention focus, whereas attention style as per direction refers to external and internal attention focus.

- A. **Width:** refers to athletes' tendency to take in multiple or wide range of information as opposed to focusing very narrowly on one source of information or cue while churning out other cues and information.
- (a) **Broad Attention Focus** allows athletes to perceive several occurrences simultaneously. Athletes with broad attention focus would be aware of rapidly changing situation and environment around them. For example, a batsman focusing on the pace of the ball as well as the seam and swing



of the ball, or a football player dribbling the ball focusing on ball as well being aware of the space where he is moving.

- (b) **Narrow Attention Focus** is the ability of the athlete to focus on a particular or important task when surrounded by multiple cues. For example, athlete listening only to his team-mates' instructions or focusing on to their specific task rather than getting distracted by other cues or information.

B. Direction refers to where we tend to focus our attention, and varies from internal state of own mental or physical state to external state of what is happening around the athletes.

- (a) **External Attention Focus** directs an athlete to focus outward or attend to other objects or cues other than their own self. A hockey player focusing on their own position on the field as well as attending focus to opponents and their own team mates around them is an example of external attention.
- (b) **Internal Attention Focus** directs inward thoughts without attending to the external cues or objects. A Basket baller just sticking to his/her own position on the court rather than making changes to get away from opponents or an shooter focusing only on to their shooting target without getting distracted by other influencing factors.

9.5.2 Mental Toughness

Mental toughness is a multifaceted construct made up of multiple key components including values, attitudes, cognitions, emotions, and behaviors that refer to an individual's ability to thrive through both positively and negatively construed challenges, pressures, and adversities. Mental toughness is having the natural or developed psychological edge that enables you to (a) generally, cope better than your opponents with the many demands (competition, training, lifestyle) that sport places on a performer, and (b) specifically, be more consistent and better than your opponents in remaining determined, focused, confident, and in control under pressure.

Mental toughness is not considered just as personnel disposition anymore, according to latest research mental toughness consists of 'natural and developed' psychological characteristics. Mental toughness is important to sports psychology because it represents a culmination of what it takes to be an elite athlete at any level of competition. There are several important factors required for mental toughness:

- i. Ability to thrive through challenge,





- ii. Sport awareness,
- iii. Tough attitude,
- iv. Desire for success.

Attributes of Mental Toughness

Mental toughness can be developed among athletes and play an important role in competitive sports. There are several characteristics of an individual which can be considered as attributes of mental toughness.

- Self-confident and self- assured
- Able to focus and concentrate
- Intrinsically motivated
- Strong work ethic
- Committed to excellence
- Persistent and determined
- Positive attitude, no negativism
- Resilient in the face of failure or injury
- Thrive on pressure and challenge
- Consistent personal values
- Emotional intelligence
- Physically tough
- Gracious in face of success

9.5.3 Resilience and Sports

The challenge to solve mystery of life is lifelong. The ability to cope and recover with these said or unsaid encounters in life is known as Resilience. The one who has the ability to adapt to life's challenges by integrating a wide range of traits, habits, and skills is a resilient person.

Resilience refers to one's ability to bounce back emotionally in the face of adversity
Resilience is the ability to bounce back from adversity, trauma, tragedy, danger or other sources of stress in life.

Resilience is the force within the individual that drives a person to confront and overcome adversity. Resilience drives a person to confront and overcome adversity



and has been described as an innate righting mechanism. This force may be described as an innate mechanism and as the human capacity to confront and overcome adversity.

When stress is prevalent, one can learn to deal with it and bounce back quickly. Becoming more resilient in the face of inevitable stress can enhance one's outlook and health significantly. In other words, it can be said that one of the ways in psychology, to deal with trauma, threats, adversity, or substantial stressors such as problems in sportsperson's personal or professional life, health challenges, and performance-related stress is to develop a strategy known as Resilience.

Sports is no different story, everyday existence in sports entails a certain amount of stress. It's always there, no matter if it is learning of the new skill, injury, fear of training load, challenge of winning in competition, etc. In the face of hardship situations in sports, it is easy to lose one's composure. Despite the best efforts to cope with pressure, results might be unfortunate like, high chances of failure, dropouts, loss of interest, lack of confidence, harm to self, aggression, inability to perform learnt skills, etc

Types of Resilience:

1. **Natural Resilience:** It is a natural ability that is bestowed upon a person at conception. It is characterized by openness to new experiences, an eagerness to learn, and a want to have fun.
2. **Adaptive Resilience:** Adaptive resilience is when, as a result of adverse circumstances, one has to learn, adjust and adapt.
3. **Restored Resilience:** Restorative or "learned" 'resilience is the type of resilience, restored by learning skills that aid in coping with life's challenges. This can also aid in dealing with the past, present, and future traumas in a more effective manner.

I. Tick the correct option.

1. Which of the following is not a psychological attribute ?
 - i. Heart rate
 - ii. Attention
 - iii. Resilience
 - iv. Mental Toughness
2. Attention focus allowing athletes to perceive several occurrences simultaneously is referred as:





- i. Narrow Attention Focus
 - ii. Broad Attention Focus
 - iii. External Attention Focus
 - iv. Internal Attention Focus
3. An individual's ability to bounce back emotionally in the face of adversity is referred as :
 - i. Aggression
 - ii. Anxiety
 - iii. Resilience
 - iv. Motivation

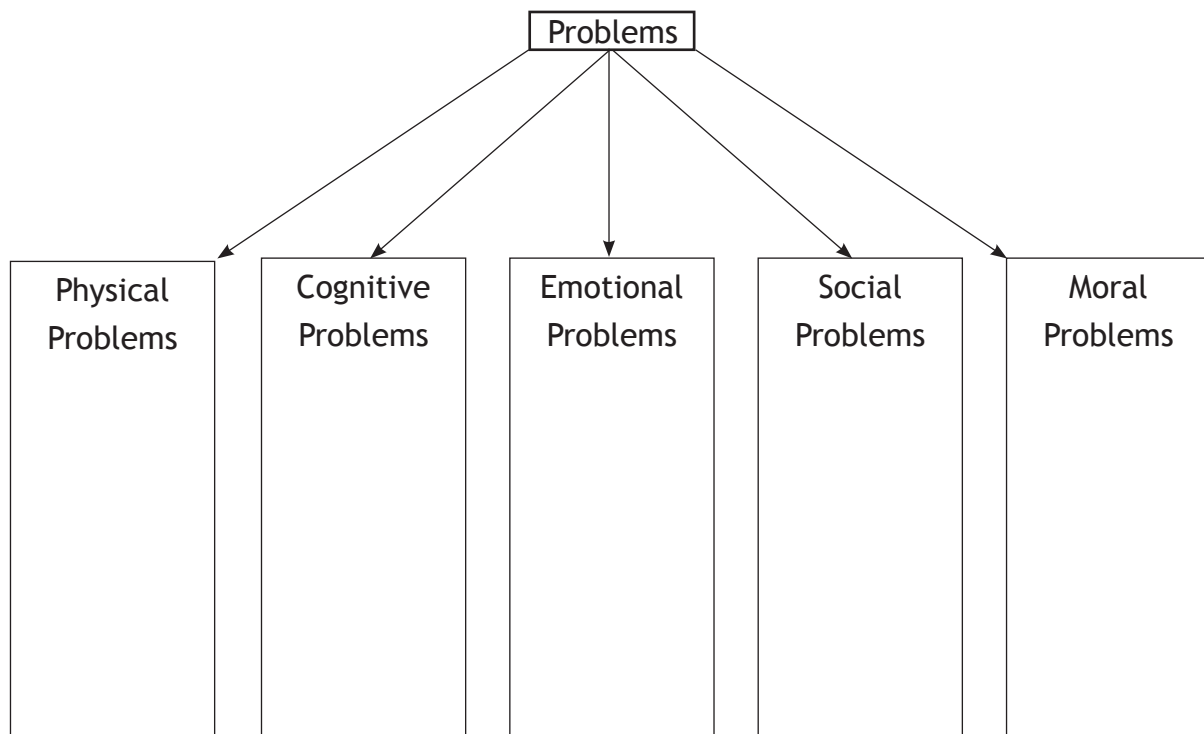
II. Answer the following questions briefly.

1. Describe Attention along with its types?
2. Explain Resilience and its importance in sports?
3. Describe role of Mental Toughness sports performance?

III. Answer the following questions in 150-200 words.

1. Explain the role of various psychological attributes influencing sports performance ?

IV. What are the common problems faced by Adolescents?



V. Case Study



Zaneet , a school sports champion and grade A student, has not been performing well in the past few months due to which his coach scheduled a counselling session with him to understand his problems. After a heart to heart talk the coach understood that his problems are basically related to his age and are commonly faced by Adolescents. Therefore he explained to Zaneet how to deal with these issues.

- List down any four Adolescent problems.
- List down any four ways how to manage Adolescent Problems.
- What is the range of Adolescence?

VI. Sports Integration

Sports Integration - WRITING A STORY

Choose an Indian athlete who has won a medal in the International arena - Olympics, Paralympics or Special Olympics. Research and write the story of the athlete highlighting the factors that made her/him succeed.





Suggested Reading

- Baron. R.A. (2008). "Psychology" Pearson Education South Asia, New Delhi.
- Cox. R.H. (2012). "Sport Psychology: Concepts and Applications" Mc Graw Hill, New York, USA.
- Jarvis. M.(2006). "Sport Psychology" Routledge, New York, USA.
- Weinberg. R.S; Gould.D. (2003). Foundations of Sport and Exercise Psychology" Human Kinetics, Champaign. USA.



UNIT 10

TRAINING AND DOPING IN SPORTS



Content

Concept and Principles of Sports Training

Training Load: Over Load, Adaptation, and Recovery

Warming-up & Limbering Down - Types, Method & Importance

Concept of Skill, Technique, Tactics & Strategies

Concept of Doping and its disadvantages





Learning Outcomes

You will

- understand the concept and principles of sports training.
- summarise training load and its concept.
- understand the concept of warming up & limbering down in sports training and their types, method & importance.
- acquire the ability to differentiate between the skill, technique, tactics & strategies in sports training.
- interpret concept of doping.



Discussion					
Do you follow a fitness routine? Complete the given training and share your information within your group. After discussion, is there anything you would like to change? If so, why/why not?					
Personal Details					
Name		Age		Gender	
Physical Fitness Goals					
What are your short-term physical fitness goals? (3 months)		What are your medium-term physical fitness goals? (6 months)		What are your long-term physical fitness goals? (a year)	
Your Current Lifestyle/state					
How would you describe your current level of fitness?	Unfit	Below Average	Average	Good	Very Good
How important is an exercise to you?	Not all important	Slightly important	Moderately important	Very important	Extremely important
How often do you exercise?	1-2 times a week	2-3 times a week	3-4 times a week	4-5 times a week	Everyday
What barriers, if any, prevent you from exercising more regularly?	I don't have enough time	I can't stay motivated	I have an injury	I don't enjoy exercising	I exercise regularly with no barriers
Would you say you eat a healthy balanced diet?	Not really	Sometimes	Fairly often	Often	Always

10.1.1 Introduction

Sports performance training is the training of the body and mind to prepare the athlete for the rigors of a specific sport. It differs from personal training in that the athlete is conditioned and appropriately prepared to compete in her/his sport of choice, rather than broader general fitness. Individual characteristics such as age, gender, and fitness levels are combined with scientifically proven training methods





and exercises to create a customized, sports-specific workout plan that results in a more confident, motivated athlete. The focus is to enhance the athlete's performance in competition by using the latest advancements in sports science and kinesiology to develop a sport-specific strength and conditioning programme that improves the athlete's overall athleticism - strength, agility, speed, power, coordination, and balance as it relates to the sport in which they compete. For example, a volleyball player involved in sports performance training will perform exercises that mimic the movement patterns required on the volleyball court. She will focus on reaction, balance, vertical leap, agility, and high-intensity interval training. By modelling her training around the demands of her sport, she will develop the specific abilities needed to excel in competition.

Do you know?

The preparations of an ancient Olympic athlete started many months, even years, before the opening of the festival, in the gymnasium. The Ancient Greek gymnasium was a public location used for training, education, exercise, and socializing - something like the modern community centre. In Ancient Greek society, achieving a harmonious balance between body and mind was an essential aspect of an individual's personal development. Therefore, the gymnasium hosted wrestling matches and provided weight lifting training as well as music rehearsals and philosophy lectures.

10.1.2 Meaning and Concept of Sports Training

Training for achieving something in a competition is not a new idea. With the passage of time, more time and effort is being devoted to training and preparation for competitions. For example: Invention of new techniques in the field of athletics and weight training methods has shown very encouraging results. Training for any game or event has become very technical, and a scientific approach is needed to get the desired results.

Sports training is based on specific individual care, improved fitness, scientific ways, psychological feedback, technical help, sound machines and apparatus, climate, diet, safety precautions, etc. Training methods are based upon scientific principles in a systematic order. Thus, the training helps develop fundamental skills, advanced skills, techniques, tactics, strategies, emotional stability during the competition, motivational forces, etc. It gives the trainee practical and theoretical knowledge regarding performance, and it also guides her/him on how to improve further in different ways. We can say that these are methods to improve general and specific performance in games and sports. The following definitions may be helpful in understanding the meaning of sports training.



Definition

"Sports training is the basic form of preparation of sportsmen."

'Mathew'

"Sports training is a pedagogical (educational) process, based on scientific principles to prepare sportsmen for higher performances in sports competition."

'Hardyal Singh'

"Sports training is based on scientific knowledge and a pedagogical process of sports perfection which through systematic effect on psycho-physical performance ability and performance readiness aims at leading a sportsman to top level of performance."

"Harre"

"Sports training is the basic form of an athlete's training. It is the preparation systematically organized with the help of exercises, which in fact is a pedagogically organized process of controlling an athlete's development."

"Matveyev"

"Sports training is a planned and controlled process in which, for achieving a goal, changes in complex sports and motor performance ability to act and behaviour are made through measures of content methods and organisation."

"Martin"

"Sports training is a scientific-based and pedagogically organized process through which planned and systematic effect on performance ability and performance readiness aim at sports perfection and performance improvement as well as at the contest in sports competition."

"G. Thiess and G. Schnabel"

"Sports training is a targeted approach to training focused on your sport of choice."

"Todd Townes"

"Sports training is training designed specifically to increase performance and minimize injury of general sports performance as well as specialized sports performance."

"P. Garrison"





Extension Activity

Sports training is the process of preparing athletes for a specific competition. This preparation needs long-term planning, which includes:

- ◆ Conditioning training (strength training, endurance training, flexibility training)
- ◆ Training of technique (Technical preparation)
- ◆ Training of tactics (Tactical preparation)
- ◆ Psychological training (Mental preparation)

Working in groups, interview five sportspersons from different school teams participating in CBSE's Zonal Competitions (or any equivalent Competition). Find out details of their training under the heads given above.

10.1.3 Principles of Sports Training

For formulation, implementation, and development of players and guidelines for coaches, certain principles of sports training are followed, which are given below:

- a) **Principle of Continuity:** Training should be a continuous process. There should not be any breaks. It should be a regular phenomenon. If there are long intervals between training sessions, an individual's fitness decreases, and the human body adapts to reduced load.
- b) **Principle of progression load and overloading:** The principle of overload states that there should be greater than the average load on the body as required for training adaptation. It means that the training load should be increased to improve the performance of sportspersons. The load should be given carefully. If more load is given to the trainee constantly, performance may decline.
- c) **Principle of Specificity of Training:** General and specific training are equally important to improve performance. Initially, general training should be given to developing all components of fitness and later on the proportion of specific training should be increased gradually. For example, speed improved through running will also benefit football. All athletes need general fitness development, but throwers need more strength training.
- d) **Principle of uniformity:** Firstly, training is uniform to all players. But training should have an individualistic approach with time. A coach should take into consideration the following points:
 - i. Sex
 - ii. Age

- iii. Psychological difference
 - iv. Training level
- e) **Principle of periodization:** It prepares the sportsperson to give their best performance in a particular competition. It has three phases:
- Macro-cycle,
 - Meso-cycle and
 - Micro-cycle.
- Macro Cycle:** Duration of three months to one year. The last macrocycle should be aimed at recovery and relaxation.
- Meso Cycle:** Duration of three to six weeks. Here also, the last cycle should be aimed at recovery.
- Micro Cycle:** Duration of three to ten days. The last training session should aim at recovery and relaxation.
- f) **Principle of Warming up and Limbering Down:** Warming up is a must before any training session as it prevents muscle soreness and injury. After the training session, gradual cooling down or limbering is also essential for returning to the normal level.
- g) **Principle of Active Participation:** Active participation means the player should follow the principle of the law of readiness, which is very significant for getting good results in various levels of competition. The player and teacher should participate actively.



- h) **Principle of Variety:** Training is a long-term process, and load and recovery can become boring for both the athlete and the coach. So, a successful coach should plan variety in the training programme to maintain the interest and



motivation of the athlete. Sometimes, change and variety may be achieved by changing the nature of the exercise, time of the day of the session, training group, and the environment.

- i) **Principle of Ensuring Result:** The apex aim of sports training is to attain good results. It can be said that sports training aims to enable the sportsperson to put up a better performance in the competition. This principle cannot be achieved without the implementation of other principles. So, stress should be laid on the implementation of the other principles by the coach.
 - j) **Principle of Rest and Recovery:** The training programs should be designed in a way that there is proper rest and interest in the training activities because the body regenerates during rest and becomes better and stronger than before.
-

I. **Tick the correct options**

- 1. In order to develop the best performance of an athlete in competition, sports training has become
 - a. scientific and systematic
 - b. disorganized and irrational
 - c. complex and painstaking
 - d. easy and approximate
- 2. The main benefit of systematic and scientific sports training is an increase in
 - a. performance
 - b. injuries
 - c. physical labour
 - d. supervision
- 3. 'Micro-cycle' involves training of
 - a. One week
 - b. 1-2 weeks
 - c. 6-8 weeks
 - d. 8-10 weeks
- 4. According to the Principle of Continuity, a training program should be
 - a. regular
 - b. irregular



- c. once a week
 - d. once a month
5. The systematic planning of athletic or physical training is called
- a. periodization
 - b. specificity.
 - c. frequency.
 - d. variance.
6. Which of the following is not a principle of sports training?
- a. Principle of specificity
 - b. Principle of overload
 - c. Principle of continuity
 - d. Principle of rest

II. Answer the following questions briefly.

- 1. What do you understand by the term sports training?
- 2. What is the need for sports training?
- 3. What do you understand by the Principle of Meso-cyclicity?
- 4. List the phases of the principle of periodization.
- 5. What do you mean by the progression of load?
- 6. Differentiate between general and specific preparation.

III. Answer the following questions in 150-200 words.

- 1. In what ways does sports training become an essential part of a trainee's life in sports?
- 2. Why is systematic sports training required for an athlete?
- 3. Apart from training, list the factors, that contribute to a successful plan?
- 4. "Scenario of sports training is changing day by day." Justify the statement.
- 5. All players diligently follow the principles of training. Specify the factors that should be kept in mind while preparing a training plan.





Extension Activity

For a month, every day in the morning you/all will do 30 minutes of physical activity, in which you will follow the schedule designed by your sports teacher. At the end of every week mark, the principle of sports training is applied in the training program:

List the Principles of training that you applied to improve your performance

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

10.2.1 Training Load: Over Load, Adaptation, and Recovery

The sports training process involves activities and movements, leading to fatigue. Fatigue is the direct product of load caused by physical activity or exercise. Fatigue is essential for improving the performance capacity of a sportsperson. Training load, therefore, is of central importance in sports training. Load, overload, and recovery are critical issues for team physicians treating and caring for athletes.

10.2.2 Training Load

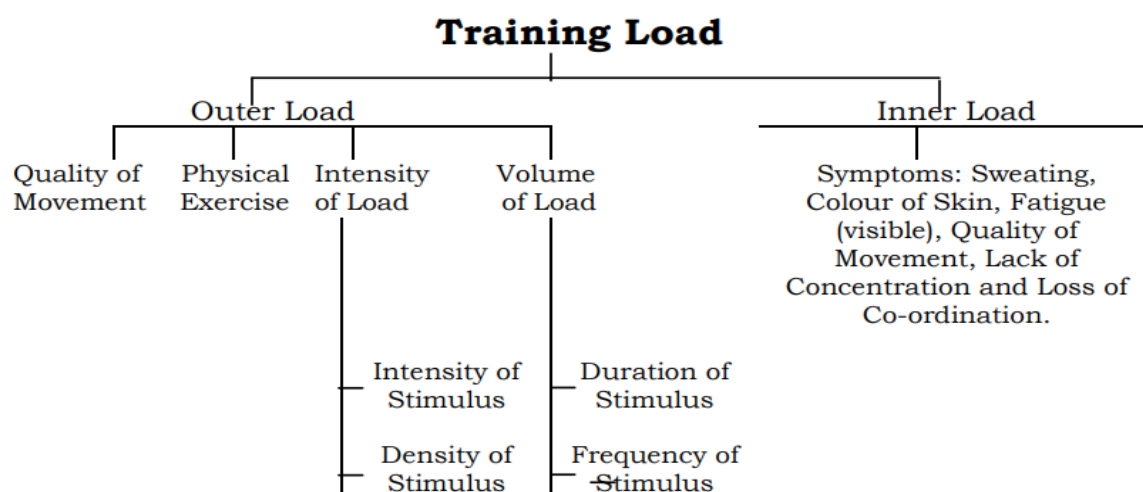
Physiological and psychological demands are placed on the individual through motor stimulus (movement), resulting in improvement and maintenance of performance capacity. Training load is of two types, namely

- Outer load and
- Inner load

Load is an inevitable result of athletic conditioning, training, and competition. Load inactivity may be a stimulus experienced and responded to by an individual before, during, or after participation. Load creates a demand or stress (both physiological

and psychological) and has internal and external components. Load that is safely managed may improve athletic capacity and performance and reduce risk of injury and illness.

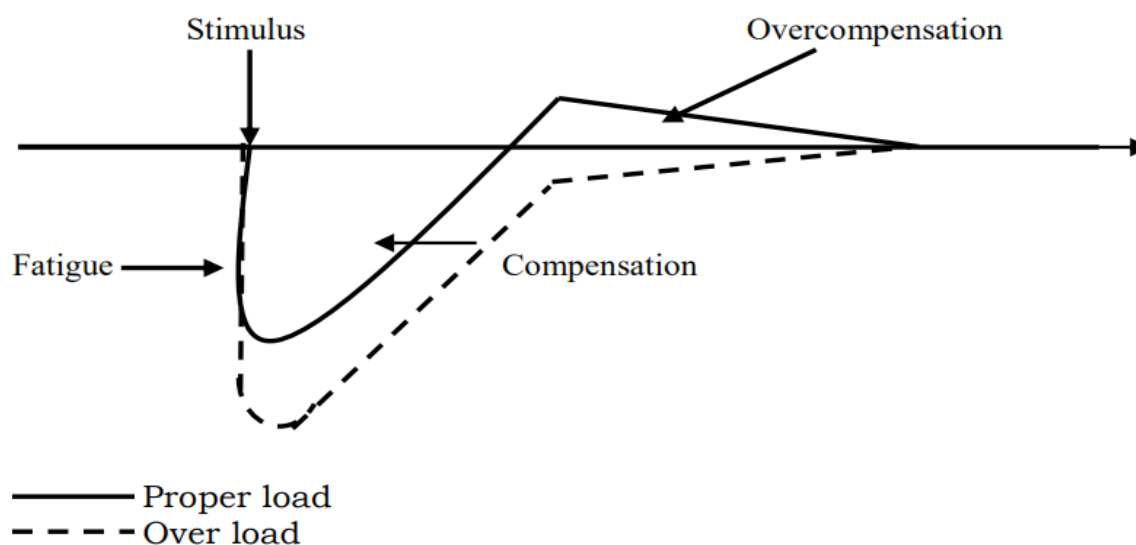
The following figure will provide a complete concept of various features of training load.



10.2.3 Overload

The normal development of the training state of a sportsperson is disturbed when the physical and psychic daily load of life exceeds the loading capacity of the individual. Overloads, administered over a more extended period, lead to decreased performance capacity. Modern sports scientists consider the overloading phenomenon a disturbance in regular nervous activity. Performance in sports is not only a matter of muscular metabolic efficiency but it also, to a large extent, depends upon the efficiency of the nervous system. When the nervous system is disturbed, optimum energy and metabolic process utilization also gets disturbed. The other body systems can also not perform to the best of their efficiency. An excessive training load causes incomplete adaptation, and the sportsperson will have problems recovering from the training stimulus. These problems with recovery can also be cumulative. They occur when the loading is repeatedly too tremendous or too closely spaced. The decline in performance caused by incomplete adaptation is one of the most apparent symptoms of overtraining. In this situation, the coach must allow time for proper recovery and should evaluate and reduce the training loads used.





Thus, we can say that overload is a load that is excessive or a load that is not well managed. It will result in anatomical, physiological, and psychosocial conditions that manifest in altered performance, injury, and illness. Identifying and modifying load and minimizing overload have been advocated as central parts of optimal performance and injury and illness and prevention strategies.

The definition of overload chosen by the coach depends upon the particular physical characteristics that need to be developed.

- **Strength:** overload is increasing the resistance in terms of kilogram, etc.
- **Strength endurance:** overload is increasing repetitions of activity with a resistance ranging from the athlete's own bodyweight to adding weighted belts, etc. to the athlete, to light and sub-maximal loads. The lactic anaerobic energy pathway has high involvement.
- **Aerobic/heart endurance:** overload is increasing the amount of time that the person can continue a low strength demand in a steady state of work of low-intensity repetitions. The aerobic energy pathway is involved exclusively.
- **Speed endurance:** overload is increasing the number of high-quality repetitions of an exercise per unit of time; or increasing the quality of repetition while keeping the number at or above a fixed threshold; although this may take place in a climate of the cumulative lactic anaerobic pathway by-products, the alactic energy pathway has critical high involvement.
- **Speed:** overload is performing (and or selecting) a given task faster.



- **Elastic strength/power:** overload is increasing the resistance without loss of speed, or increasing the speed of moving a fixed sub-max \square max resistance.
- **Mobility:** overload is taking effective joint action beyond its present limit.

Overloading is of two types.

- a) **Dominance of excitation process:** This state occurs when the training load suddenly increases without adequate preparation.
- b) **Dominance of relaxation process:** This state results when an overdose of training load is administered continuously over an extended period.

Causes of Overloading

The main cause which leads to overloading can be discussed under the following four categories:

1. Faulty Training Method

- (a) The recovery process may be neglected.
- (b) There may be a rapid increase in the training load thus adaptation does not take place.
- (c) There is a high volume of load with maximum or sub-maximum intensity.
- (d) There is forced technical training involving complicated movements without adequate rest.
- (e) There may be excess of competition with high demands.
- (f) The training may be one-sided.

2. Life Factors

- (a) The player may have had an insufficient night's rest.
- (b) The player's daily routine is irregular.
- (c) The player may have a luxurious daily routine.
- (d) There may be an indulgence in alcohol and nicotine on part of the player.
- (e) Bad living conditions of the player may be responsible.
- (f) The player's leisure time activity is faulty.
- (g) There is a quarrel in the family or the community.





3. Social Factors

- (a) There could be excess of engagements.
- (b) Friction in the family could also be a reason for overload.
- (c) If the sportsperson is unsatisfied in her/his profession or studies, it may lead to overload.
- (d) A misunderstanding with colleagues could also be a reason.
- (e) Overloading in professional work, studies etc. could also be a reason.
- (f) The family could have an unfriendly attitude towards sports.
- (g) Excess of entertainment programmes could be a reason.

4. Health Factors

The sportsperson could be suffering from any/either of the following.

- (a) Fever
- (b) Bad stomach
- (c) Infectious disease
- (d) Injuries

Symptoms of Overload

The symptoms of overload are grouped as follows and they also appear in the same order:

1. Psychological symptoms

- (a) Increased excitability.
- (b) Tendency toward hysteria.
- (c) Becoming quarrelsome.
- (d) Less contact with the coach.
- (e) Increased sensitivity towards criticism.
- (f) Depression.
- (g) Indifference.
- (h) Loss of confidence.
- (i) Loss of motivation.



2. Performance Symptoms

- (a) Increased error in technique.
- (b) Decreased concentration.
- (c) Decreased differentiation ability.
- (d) Decrease in strength, speed, and endurance abilities.
- (e) Slow recovery.
- (f) Decreased competition readiness.
- (g) Increased tendency to surrender to competition.
- (h) Uncontrolled behaviour in competition.

3. Somatic-Functional Symptoms

- (a) Loss of sleep.
- (b) Loss of appetite.
- (c) Loss of weight.
- (d) Disturbance in digestion.
- (e) Frequent giddiness.
- (f) Susceptibility to injuries.

Do you know?

Training monitoring is about keeping track of what athletes accomplish in training, for the purpose of improving the interaction between coach and athlete. Over history, there have been several basic schemes of training monitoring. However, the difficulty in standardizing the conditions of training made this process unreliable. With time, the measurement of heart rate (HR) evolved from interval training toward index workouts, where the main monitored parameter was the average time required to complete index workouts. These measures of training load focused on the external training load, and what the athlete could actually do. With the advancement in the scientific community, HR, lactate, VO₂, and power output, were used to monitor training loads in athletes of differing abilities. These methods often require laboratory testing for calibration and tend to produce too much information, in too slow a time frame, to be optimally useful to coaches. The TRIMP concept which was mathematically complex was also introduced. Nowadays wearable sensors are used which provide high-resolution data of the external training load. These methods are promising, but problems relative to information overload and turnaround time for coaches remain to be solved.





Extension Activity

Join team practice sessions and start preparing for an Annual Zonal Competition for this year. Scale your level of exertion experienced by you in the Rating of Perceived Exertion below every day after the session for 15 days.

Scale	Experience (Exertion)	<input checked="" type="checkbox"/>
0	Nothing at all	
0.5	Very, very slight just noticeable	
1	Very slight	
2	Slight	
3	Moderate	
4	Somewhat severe	
5	Severe	
6-7	Very severe very severe	
8-9	Very, very severe	
10	Maximum	

I. Tick the correct options

- Outer load in training depends on
 - sweating
 - colour of skin
 - the intensity of load.
 - fatigue
- Intensity of load, Volume of load, Physical Exercise are features of
 - outer load.
 - intensity.
 - inner load.
 - recovery
- Cause of Overload in training is associated with.
 - intensity
 - frequency
 - duration
 - faulty training method



4. Overload in sports training relates to when
 - a. oxygen is adequate to meet the needs of the body.
 - b. the oxygen-supplying mechanisms are not able to increase.
 - c. the intake of oxygen is insufficient to meet the demand.
 - d. the supply of oxygen is more than required.

II. Answer the following questions briefly.

1. What do you mean by training load?
2. List the causes of training overload?

III. Answer the following questions in 150-200 words.

Explain overload in training and draw a flow chart of symptoms of overload?

10.2.4 Adaptation

In a literal sense, the word adaptation means to get adjusted. The human organism can get modified (adapted) to the environment, and as the environmental conditions change, the human organism also changes in due course. This adaptation process is also applicable to sports training—the human organism can modify to a new state of performance efficiency due to the administration of external load. Thus, load and adaptation go side by side. This adaptation process is biochemical and applies to improving conditional abilities (strength, speed endurance) only. As the sportsperson is exposed to the training and competition demands, this results in a disturbance of the homeostasis (internal body balance). The sportsperson makes an effort to restore the state of homeostasis by causing the different systems and bodily functions to adjust to the state of disturbance. In case the bodily homeostasis is disturbed again and again for a certain period, the human body responds by causing structural and metabolic changes, enabling the body to withstand the load more efficiently. This is called adaptation.

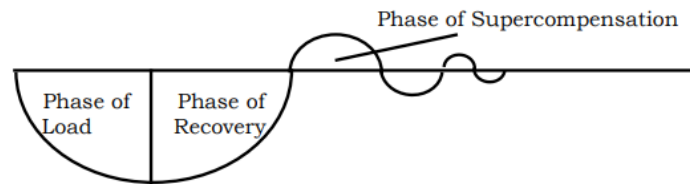
The following three conditions are to be fulfilled for adaptation to the training load.

1. Training load has to be as per the loading capacity of the sportsperson.
2. Recovery period should be in proportion to the training load.
3. Loading and recovery process must be repeated for a certain period (10 to 20 days).





Effect of one training schedule on performance



Effect of regular training on performance

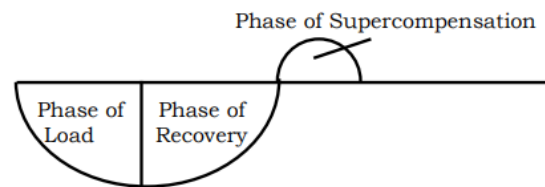


Fig. 3. Adaptation to training loads

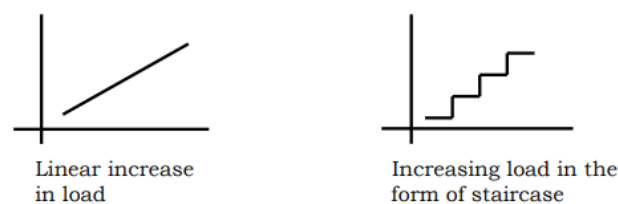


Fig.4. Procedure of increasing training load

Conditions of Adaptation

To ensure the effectiveness of the training load in each training unit, the following conditions of adaptation are to be strictly adhered to:

- Adaptation is maximum when the training load is given on an individual performance basis. To enable a sportsperson to have optimal benefit from training, the limitations shall be administered keeping in mind the specific character of an individual.
- There should be a correct proportion between intensity and volume of training load. The intensity of stimulus has an inverse relationship with the volume of stimulus.
- The adaptation process results from the correct proportion between phases of load and recovery.

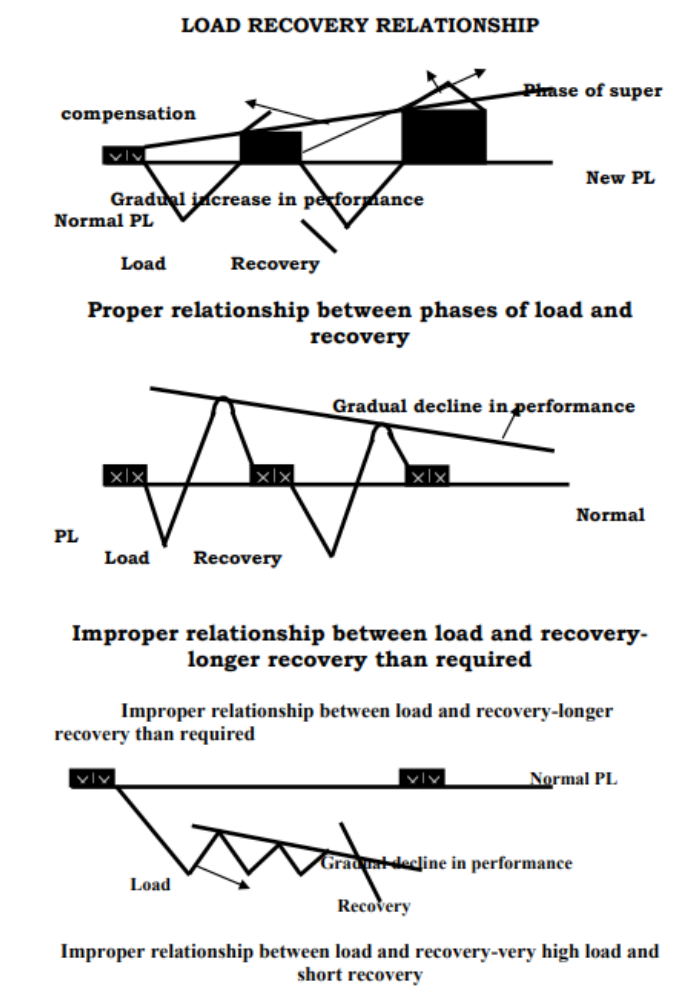
Recovery

Both training and competition loads enhance sports performance. In the long-term training process, the quantum of load is gradually increased, leading to improved performance. A beginner adapts to training load faster, whereas, with the increase in training age, higher loads are administered, resulting in slower growth in performance. Sportspersons cannot effectively undertake very high loads of training unless proper

means are adopted to accelerate the process of recovery. Administering appropriate means can ensure quicker recovery and enable a sportsperson to undertake more frequent loads.

Recovery is the period and process during which the body responds to load. Adequate recovery may result in positive adaptations for athletic capacity, performance, and injury and illness risk. In contrast, inadequate recovery may maladapt for athletic ability, performance, and illness.

Recovery from training and competition loads requires a considerable amount of time. Recovery can be divided into the following three stages:



Stage I:

In this phase, fatigue and recovery co-occur as the training or competition progresses. This process occurs because of the resynthesis of adenosine triphosphate (ATP), Creatine phosphate (CP), and glycogen and the neutralization of lactic acid. For activities, which continue for a long duration and for sports played for a considerable period, the pace of recovery in this phase plays an important role. Recovery during this phase largely depends upon the functional capacity and efficiency of different systems and organs.





Stage II

This phase commences with the completion of the training schedule (cessation of physical activity) and ends with the restoration of homeostasis of the body. This phase lasts from a few minutes to 2 to 3 hours. The following active recovery means can be adapted to make the recovery process faster.

1. Deep breathing exercises
2. Intake of drinks containing carbohydrates, vitamins, salts, and minerals.

Stage III

This phase of recovery can last from many hours to several days. In this phase, the anabolic process facilitates recovery. Substances such as enzymes and proteins, which get depleted in the process of undertaking the load, get resynthesized.

The pace of recovery is affected by the following factors:

Stimulus intensity and stimulus volume (factors of load).

- a) Types of training load
- b) Health and fitness status
- c) Rest and sleep
- d) Good diet
- e) Daily routine
- f) Total load of the day

Do you know?

There are two different categories of recovery:

- ◆ **Immediate or short-term recovery** - This is the most common form of recovery and occurs within hours after an exercise session or event. Short-term recovery includes low-intensity exercise after working out and during the cool-down phase.
- ◆ **Long-term recovery** - This refers to recovery periods that are built into a seasonal training schedule and may include days or weeks incorporated into an annual athletic programme.

Extension Activity

As a group, survey whether your school team preparing for zonal competitions for this year is recovering and adapting properly. Scale their level of physiological experience in the form below:

S.no	Experience	<input checked="" type="checkbox"/>
1	Fatigue	
2	Loss of motivation	
3	Irritability	
4	Restlessness	
5	Weight loss	
6	Lack of mental concentration	
7	Sore muscles	
8	Anxiety	
9	Unrefreshed on awakening	

I. Tick the correct options

- Which are the conditions that need to be fulfilled for adaptation to the training load?
 - Recovery period should be in proportion to the training load.
 - Rest should be given more focus than training
 - Loading process must be repeated for a long period
 - Training load should not be compromised even during injury
- Factors for the slow pace of recovery include
 - optimal health and fitness
 - adequate rest and sleep
 - good diet
 - fatigue and lactic acid accumulation
- Overload in training can be avoided by increasing
 - intensity
 - frequency
 - duration
 - recovery





II. Answer the following questions briefly.

1. What do you mean by adaptation?
2. Explain the importance of the recovery process in training?

III. Answer the following questions in 150-200 words.

1. Explain the conditions of Adaptation that ensure the effectiveness of the training load

10.3.1 Warming up and Limbering Down

Warming up is a process by which the human machine is brought to a condition at which it safely responds to the nerve impulses of the person for quick and efficient action. Warming up is heating the body's muscles and preparing them to start work. It helps the athletes prepare physically, mentally, and physiologically for any training or competition. If warming up is effective, muscles become ready to respond efficiently. In this process, muscles are warmed-up by running, jogging, and performing freehand exercises before the training or competition. This preparation before training or competition is called warming up. The following definitions may help to know more about warming up.

- "Warming-up raises the body temperature by running and performing exercises before the activity or competition."
- "Warming up is a practice in itself."
- "Warming up is a process by which human-machine is brought to a condition at which it safely responds to the nerve impulses of the persons for quick and efficient action."
- "Warming up is done to tone up the body to meet the ensuring activity."
- "Warming up consists of a series of preparatory exercises either before a training session or competition."





Types of Warming-Up

There are the following types of warming up.

1. **Passive Warming-up:** In this, the player warms up his body through external sources and not with actual participation in physical activity. It can be done by sunbathing, using a heavy uniform, drinking hot water, massage, drinking hot beverages (tea, coffee), etc. Performing Passive Warming-up by these means is beneficial because there is no energy expenditure in warming up.
2. **Active Warming-up:** In active warming-up, the individual warms his body through actual participation in physical activities. These activities improve his efficiency and tone up the muscles for the training for competition. Its duration is 10 to 30 minutes. Warming up is done slowly without spending much energy just before the workout. In active warming up the body's temperature increases up to the required level. Jogging and stretching exercises are included in such type of warming-up. There are two types of active warming up:-
 - (a) General Warming-up
 - (b) Specific Warming-up
 - (c) **General Warming-up:** General warming-up is usually performed in all types of activities. This warming-up type includes jogging, jumping-running, stretching, striding, wind sprints, calisthenics, and other general exercises. It increases the mobility of all the joints and improves the coordination of the body and mind. It also enhances muscle tone. It prepares the body physically and mentally. The duration of general warming up depends upon the nature of the work.
 - (d) **Specific Warming-up:** These particular exercises are performed after the activities of general warming-up. They are of a particular type that vary from game to game. This type of warming up increases the mobility of all joints and improves the coordination of the body and mind. For example, a sprinter may take a few starts and run for a short distance before the actual competition. A basketball player may practice for lay-up shots or free throws before the match. The primary stress is practicing various skills in the game, in the specific warming-up.





Picture Source: <https://exerciseinjuryprevention.weebly.com/>

Do you know?

Warming up is a preliminary exercise of physical and mental preparation for strenuous exertion.

Specific Warming-Up for Some Games

- **Basket Ball:** Dribbling, shooting, shuttle run, lay-up shots, dodging, free throws and take practice, etc.
- **Cricket:** Dummy bowling and batting, catching, fielding, etc.
- **Badminton:** Tossing, high clear, low clear, smashing, making with jumps, dropping practice and court crafting, etc.
- **Tennis:** Knocking, wall practice, volley, clear service practice, clear slice, lob, return, etc.
- **Shot Put:** Shifting the shot from left hand to right hand and vice versa, standing throws, putting the shot with both hands, gliding practice with or without the shot, etc.
- **Kho-Kho:** Dodging, Zig-Zag running, pole to pole running.
- **Volleyball:** Blocking, passing, smashing, etc.

Methods of Warming Up

There are various methods through which an athlete can warm up his/her body.

1. **Physical Activities:** These activities involve some set of exercises for the body parts through which the body gets prepared to perform any task at an optimum level. These exercises must be done at a slow pace and low intensity to prevent fatigue or overload before the competition or sports event. Some of the best physical warming-up activities include:



- (a) **Jogging** - This is generally done at a slow pace for 5 to 10 minutes to increase the body temperature.
 - (b) **Bending and Stretching Exercises** - These include limb and trunk exercises like stretching of shoulder muscles, arm muscles, clavicle muscles, back muscles, hip muscles, and leg muscles and include movements like flexion, extension, abduction and adduction, circumduction, and rotation.
 - (c) **Striding** - Striding is best before events requiring explosive effort. The athlete may run around 30 to 40 meters at sub-maximum intensity at least 3-4 times with proper rest in between.
 - (d) **Wind Sprints** - Wind sprints are sprinting exercises performed for short distance with spikes. The athlete moves from a walk or slow run to a faster run and repeatedly reverses.
- 2. **Massage:** This method increases and regulates blood flow in the body, thereby increasing the athlete's body temperature for producing efficient movement. Different techniques of massage include effleurage, petrissage, kneading, friction, vibration, and percussion.
 - 3. **Drinking Hot Beverages:** This method including warm water, tea, coffee, etc stimulates the body's functions. However, care must be taken to consume these in limited quantities to avoid any discomfort.
 - 4. **Bath:** Hot bath therapy is usually very common in sports in cold countries. It can be performed before and after the task. A hot bath before the event may improve the blood flow, and increase body temperature and muscle activation of the athlete. After the task, it may help an athlete to cure muscle tension and reveal relaxation to the body.

Importance of Warming Up

Warming up plays a vital role in sports training or competitions.

- 1. **Psychological preparedness:** Performing a set of routine or specific activities/ exercises before the training and competition helps an athlete plan and build himself /herself to competing readiness, thereby eliciting optimum output.
- 2. **Reduces anxiety and tension:** Warming up reduces anxiety and tension and increases the motivational levels of a sports person.
- 3. **Facilitate optimum performance:** Performance can be optimised by increasing the speed of nerve impulses and metabolic rate improving the reaction time of a sports person.
- 4. **Prevents sports injuries:** Adequate warming up before the training period or competition prevents loosening and tearing of muscles and reduces muscle cramping.





5. **Assists flexibility:** Warming up assists flexibility and increases the range of motion helping a sportsman to exert force up to maximum reach.
6. **Enhances mechanical:** Suppleness of muscles is increased through warming up.
7. **Facilitates motor fitness components:** Motor fitness components like strength, endurance, flexibility, coordinative abilities, and speed are enhanced.
8. **Increases muscle temperature:** As a result of warming up, which muscles both contract more forcefully and relax more quickly, the risk of over-stretching a muscle and causing injury is reduced. It also improves muscle elasticity; this can enhance speed and strength.
9. **Increases blood temperature:** Due to warming up, there is an increase of blood temperature and build up of lactic acid, which leads to weakening of the binding of oxygen to haemoglobin. As a result, oxygen is more readily available to working muscles, which may improve endurance.
10. **Blood vessels dilate:** Warming up dilates blood vessels that increases blood flow and reduces stress on the heart.
11. **Increases range of motion:** The increased range of motion allows large joints such as shoulders and knees to reach their maximum movement potential.

10.3.2 Meaning of Limbering Down

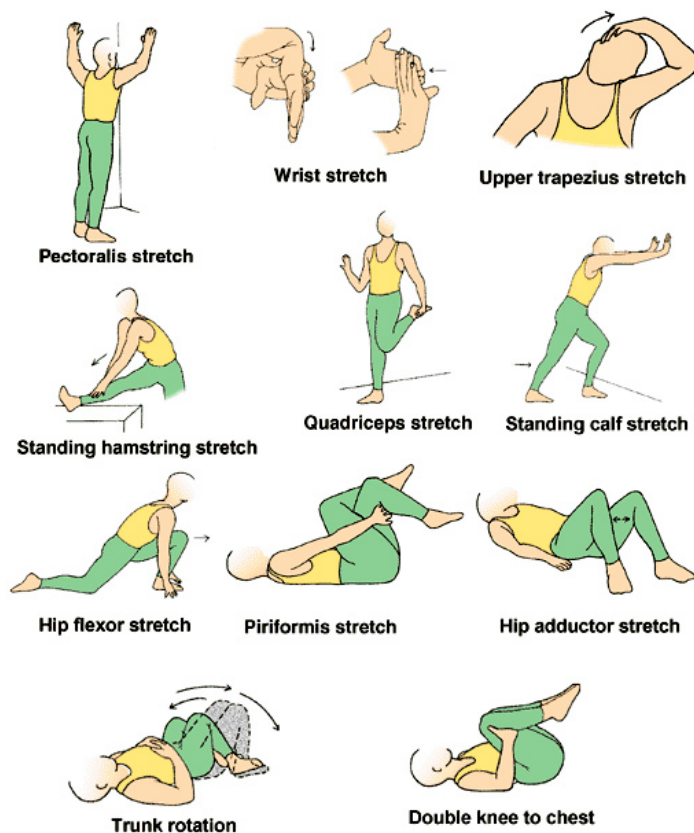
Limbering down or cooling down is also called warming down. This is an easy exercise that will allow the body to gradually shift from an exertional state to a resting or near resting state. It is a necessary activity after training or competition. Depending on the intensity of the exercise, cooling down can involve a slow jog or walk, or stretching can be used with lower intensities. Players take a cooling bath, ice bath, or cryotherapy for relaxing their muscles.

Some major static stretching exercises which are very important for cooling down are described here.

- **Ham Strings:** Lying on your back, raise one leg straight directly, above hips. Holding the calf or thigh, press the heel towards the ceiling as you pull the leg back towards the chest. Repeat the same for the other leg.
- **Chest:** Standing straight, interlace fingers behind your back. As you straighten out your arms, lift your chin towards the ceiling.
- **Glutes:** Lying on your back, cross your right leg over the bent left knee. Then bring the left knee to the chest, holding onto the back of your thigh, gently pressing the right knee wide.



- **Quadriceps:** Lying on your right side, pull left leg into the left glute, feeling the stretch in front of the thigh.
- **Triceps/Shoulders:** Take one arm overhead, bend at the elbow joint, and extend your palm down the centre of your back, gently pulling the elbow with the opposite hand. Take the same arm across the chest, gently pulling at the elbow joint to extend through the shoulder.



Picture Source: http://jump3.adsguest.com/html01_w301.php?hh=www.infracomposites.com&s=2.157.6282865.4.28.33.types%20of%20dynamic%20exercises

Do you know?

Stretching keeps the muscles flexible, strong, and healthy, and we need that flexibility to maintain a range of motion in the joints. Without it, the muscles shorten and become tight. Then, when you call on the muscles for activity, they are weak and unable to extend all the way. That puts you at risk for joint pain, strains, and muscle damage.

Benefits of Limbering Down

- a) **Regulating your heart rate.** Exercising in general causes your heart rate to increase and after exercising, your heart beats faster than normal. You need to bring it to its normal rate, but stopping suddenly and quickly, without slowing down gradually, can cause dizziness and light-headedness. So, for instance, if you are running, the best way to slow your heart rate down is by walking.





- b) **Control body temperate:** Exercising causes your body temperature to increase. After exercising, body temperature needs to be normalized. A proper cooling down or limbering down helps in reducing the body temperature to normal.
- c) **Preventing injuries:** Like warming up, cooling down after exercises helps prevent injuries such as muscle tears. Skipping cooling down and stretching after a workout not only slows down muscle recovery but also reduces the benefits gained from a workout.
- d) **Stress relief and relaxation.** Exercising is as good for the mind as it is for the body. As your body begins to slow down, you begin to get into a relaxed mood and the brain begins to release dopamine and serotonin, the two hormones that are responsible to make us feel good and less stressed.
- e) **Body restoration.** Our bodies undergo several changes during working out, such as increased secretion of adrenaline, increased temperature, and accelerated breathing. Cooling down after a workout helps restore the body to its normal condition.
- f) **Reducing the build-up of lactic acid.** After intense workouts, lactic acid builds up in our bodies which can lead to muscle cramping and stiffness. Cooling down helps speed up the process of releasing the lactic acids in our body and accordingly, the body recovers more quickly.

I. **Tick the correct option**

- 1. Warming up is performed to
 - a. learn new skills
 - b. enhance mechanical efficiency
 - c. relax
 - d. reduce heart rate
- 2. Cooling down activity is performed for
 - a. dilating blood vessels
 - b. increasing muscle temperature
 - c. increasing blood temperature
 - d. reducing the build-up of lactic acid

II. **Answer the following questions briefly.**

- 1. What do you understand by active and passive warm-up?
- 2. What do you understand by the term specific warmup?



3. List the names of any four muscles that relax during cooling down.

III. Answer the following questions in 150-200 words.

1. "Warm up is important for optimum performance". Justify the statement.
2. Define Cooling Down. Enlist the benefits of cooling down.
3. How is general warming up is different from specific warming up?

10.4.1 Concept of Skill, Technique, Tactics & Strategies.

Skill, Technique, and Style are essential attributes for an athlete to perform at an optimum level on the sports field. Some people are born with a natural ability for a particular game or sport such as speed, agility, coordination, flexibility, balance, and reaction time. But they still need to develop and perfect their skills with frequent practice to bring about the result they wish to achieve. In simple words, skill is a learned and practiced ability that helps an athlete or sportsperson achieve the desired result with maximum certainty and efficiency. Technique is the way of performing that fundamental skill/activity in a sport involving a well-timed and coordinated sequence of muscle actions so that the movements involved produce the best performance and are least likely to cause injury. Style, on the other hand, is the individual's way of adapting skill and technique to develop his/her performance in a smart way.

Skill

Skill can be defined as the capacity of the sportsman to realize the technique in actual motor action. Skill is defined as the automatization of motor action. Skill is sport-specific. It exists within all sports, but each sport needs different skills. A skill is seen as a coordinated action involving a group of movements executed consistently and smoothly. There are many interpretations of what constitutes a skilful movement because views vary from novice to expert. Several different experts have defined the skill. The following are some definitions: -

"An organized, coordinated activity in relation to an object or situation, which involves a whole chain of sensory, central and motor mechanisms."

"Galligan"

"Excellence of performance - the successful integration of a hierarchy of abilities appropriate to a task under given conditions."

"Prof. G.P. Meredith"





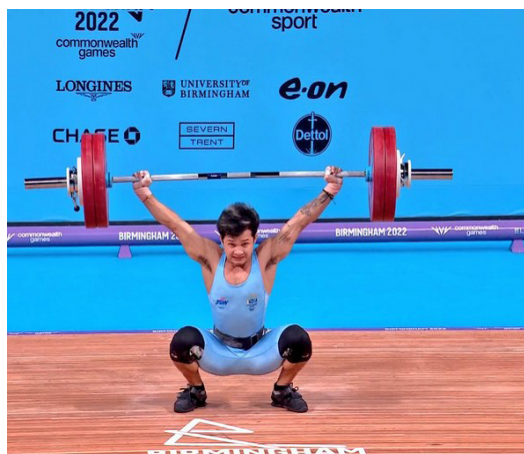
Picture Source: <https://www.gq.com/story/watch-lionel-messis-record-breaking-free-kick>

Do you know?

Anders Ericsson, a psychologist, writes that it takes 10,000 hours of practice to become an expert. In other words, an athlete training for 5 hours a day, for 7 days a week over 365 days a year would take about 5.5 years to acquire expertise in her/his chosen sport or game.

Technique

Technique is the mechanical model of doing any task through which an athlete minimizes his energy expenditure and produces remarkable output. It involves a well-timed and coordinated sequence of muscle actions that have been developed through the experience of players, coaches, and the analysis provided by sports science. These techniques have evolved and been refined so that the movements involved produce the best performance and are least likely to cause injury. Using good technique in sports is beneficial because it promotes high performance and reduces the risk of injury.



Picture

Thus, technique means the way of doing a particular task scientifically. This way



of doing a thing should be based on scientific principles and effectively achieve an aim. It is an essential movement of any sport or event. We can say that a technique is a way of performing the skill. It is the basic movement of any sport or event. For example, rolling the thumb over the cricket ball by the bowler in cricket is a technique to get the extra spin. Several techniques are combined into a movement pattern in the triple jump (running and then hop step and jump phases.)

“Technique is the most rational and effective form to perform exercises.” A technique involves scientific and economic methods adopted to achieve top performance in sports competitions.

“Ozolin N.

Tactics

We can say tactics are the skills required in any game that allows a player or team to effectively use their skills and talent to the best possible advantage, consisting of tactical actions as well as other measures which are adopted before or during the competition for successful participation.

Tactics have been defined as the following.

- Tactics are actions and strategies planned to achieve an overall objective and, in the sport, that objective is predominantly to win.
- Tactics- It means the intelligent or creative application of skills during the competition.
- Tactics are methods by which performers try to outwit (get the better of, beat) an opponent.

Tactical preparation relates to measuring especially organized physical exercises, trials, mental drills, modelling, etc. Its aim is to inspire and encourage cognitive and competitive tactics. Tactical preparation enables athletes to make the most effective utilization of their motor and technical abilities in competitions. Strategy and tactics should not be used interchangeably. Strategy is the overall plan for successful participation in the competition whereas tactics is the actual realization of strategy in practice.

Factors affecting Tactics

- a) Opposition - including their strengths and weaknesses.
- b) Players available for selection.
- c) The importance of the game/match.
- d) Possibly even the weather.





Do you know?

The spatial component is foundational to tactical awareness. Once students appreciate the need to manipulate how they use 'space', then 'time' and 'force' components become a natural progression to their growing tactical sophistication. The advanced components add to the relationship aspect of tactical play. Opponents who can use space, force, and time to affect their play create an unpredictability that keeps the outcome of play uncertain as they probe the ability of their opponents. This relationship focus is fundamental to making gameplay.

Elements that develop Tactical understanding

Game and focus	Principle of Play depth	Tactical Awareness Components for breadth				
		Initial			Advanced	
		SPACE	FORCE	TIME	SELF	OTHER
		Where	How	When	In relation to...	
<i>Toss onto target</i> Bounce, catch then send. Co-operative then compete	Consistency ↓ Placement & Positioning	Where is the biggest target area?	How hard send ball to be able to get ball to hit target?	When playing a shot can you get to next shot?	In relation to the ball move self to bounce of the ball	
		Where is your partner's target area?	How will you apply the force to keep the ball in?	When use height to recover?	What is the area to get into to be ready for next shot?	How can you anticipate the placement of partner's shot?
<i>Castle game</i> Bounce to hit target. Co-operative then compete	Consistency ↓ Placement & Positioning ↓ Spin & Power	Where will the ball land?	How can you use force to control ball accuracy?	When do you hit the ball high for time to get to bounce?	In relation to target where is best place to stand?	In relation to opponent's hit where should you stand?
		Where do you go after striking the ball?	How hard hit ball and in which direction to be ready for next shot?	When will partner hit ball to target?	How can you position yourself to use your favoured side?	Can you send the ball where your opponent does not expect it to go?
		Where will the ball bounce if you use spin?	How will force be applied to the ball to make it spin?	When should you spin the ball and when use power?	How well can you spin the ball and control placement?	How can you use spin to get your opponent out of position?

Strategies

Strategy is basically laying down the goals and making a plan to get there. In short, this is something like, having the goal to win the season or win the match as well as making a plan to achieve this, such as developing an athlete's power, working on comradery, and selecting the right players.

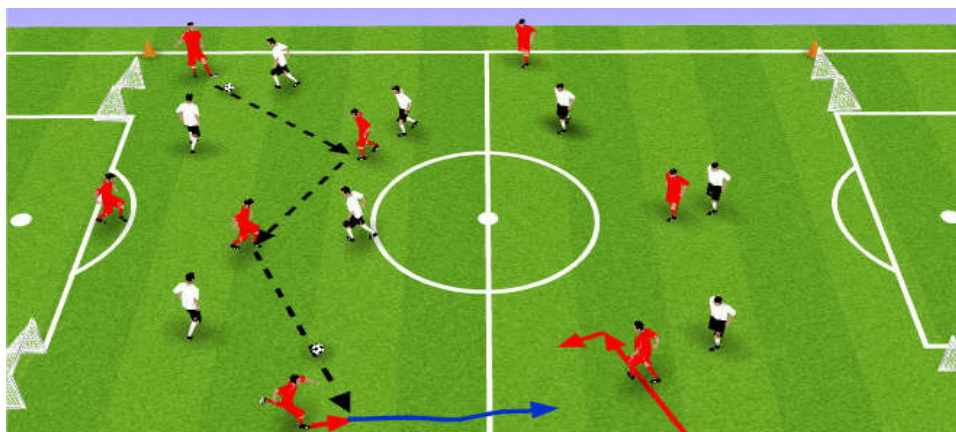
It can be defined as "a plan of action designed to achieve a long-term or overall aim."

Strategy often requires a SWOT (strengths, weaknesses, opportunities, and threats) analysis. The coach might analyse the team and plan to utilise strengths and develop weaknesses. She may also analyse the opposition to identify the best approach to be

used in the game to win. For example, the team has a weak tackler to target.

Strategizing is a great way to improve the team's synchronicity. The process involves aligning each member to the same end goal. Each of the players' motivations are combined and the team's morale consequently improves. Having the same focus and end goal will have them work as a unit in the game.

If the team has a strategy, improvements in players' individual performances becomes apparent. Each player will be more aware of their individual aims and their place in the team as a whole. Formulating strategies will involve open conversations and lots of set planning of techniques and tactics. As a result, players will be more confident about what is expected of them on the field. Every player will have a better understanding of their input in the team's performance and will be more motivated. For example: Football is a game of complex strategies and tactics. The basic strategy that each football team devises for a game is called a game plan. Each team has up to hundreds of diagrammed plays and strategies that are worked out ahead of time for pre-determined situations. During the game and at half time these strategies are worked on and altered to adjust for the other team's strategies. Often how well these adjustments are made will determine the outcome of the game (offensive or defensive strategy).



Picture Source: <https://pesmic.weebly.com/grade-8/offensive-strategy>

I. Tick the correct answer.

1. SWOT in strategy is required as
 - a. strategy, working, output, and thought.
 - b. strengths, weaknesses, opportunities, and threats.
 - c. strengths, working, opportunities, and threats.
 - d. success, weaknesses, outcome, and target.





2. In football, shooting is required to score goals. Shooting is a
 - a. technique
 - b. style
 - c. skill
 - d. strategy
3. The way of performing an action scientifically is
 - a. style
 - b. technique
 - c. skill
 - d. strategy

II. Answer the following questions briefly.

1. Define Technique.
2. What do you mean by strategy in sports?
3. Elucidate Tactics in brief.

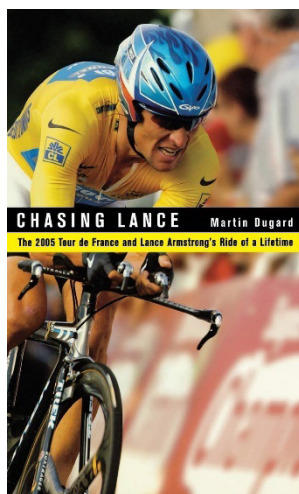
III. Answer the following questions in 150-200 words.

1. Explain the Technique with a suitable example.

LANCE ARMSTRONG CYCLE OF LIES

Lance Armstrong, (born September 18, 1971, Plano, Texas, U.S.), was an American cyclist, who was the only rider to win seven Tour de France titles (1999-2005) and was later stripped of all his titles. Why?

Armstrong entered sports at a young age, excelling in both swimming and cycling, and by the time he was a teenager he was competing in triathlons and swimming competitions. Before his high-school graduation, the junior national team of the U.S. Cycling Federation had recruited him. Armstrong competed in Moscow at the Junior World Championships and in 1990 won the U.S. Amateur Championships. In 1992 he turned professional when he joined the Motorola team, and one year later he became the second-youngest man to win in world road racing. Armstrong won stages of the Tour de France in both 1993 and 1995 but withdrew from three of four Tours he attempted from 1993 to 1996.



Picture Source: [Chasing-Lance-Armstrong-Lifetime-included/dp/0316166235](https://www.amazon.com/Chasing-Lance-Armstrong-Lifetime-included/dp/0316166235)

After the 1996 Tour de France Armstrong fell ill, and in October his physicians diagnosed testicular cancer, which had by that time also spread to his lungs and brain. He underwent chemotherapy and surgery, which were considered his best chances for survival. Months of treatments followed before he could attempt his comeback in a sport so demanding that some doctors questioned whether he could bear the strains of a three-week race like the Tour de France. In June 1998 he won his first important race since his cancer was diagnosed, the Tour of Luxembourg. Previously Armstrong had been a specialist in one-day races, but late in 1998, after a fourth-place finish in the three-week Vuelta an España (Tour of Spain), he was persuaded to change his training regime and compete in the next Tour de France.

On July 25, 1999, Armstrong became the second American to win the Tour de France, the sport's most prestigious race, and the first to win for an American team (three-time winner Greg LeMond had raced with European teams). Riding with the U.S. Postal Service (USPS) team, Armstrong won the 3,630-km (2,256-mile), 22-day race in 7 minutes 37 seconds. During the Tour, he fought allegations of doping, because traces of a banned substance—corticosteroid, from a prescription skin cream he used for saddle sores—were found in his urine. The International Cycling Union (Union Cycliste Internationale; UCI) cleared him, but he continued to endure accusations of doping, especially from the French press. Thus, Armstrong felt his July 23, 2000, win in the Tour de France to be a vindication of his 1999 win and an answer to his critics.

He won the Tour again in 2001 and 2002, relying on his strength in the mountain climbs. In 2003 he overcame crashes and illness to claim his fifth consecutive Tour de France, tying a record set by Miguel Indurain. He surpassed Indurain in 2004 when he won his sixth consecutive race. After winning his seventh Tour in 2005, Armstrong retired from the sport, but in September 2008 he announced that he was returning to competitive racing. He was placed third in the 2009 Tour de France and stepped away from competitive racing permanently in 2011.





In April 2010 Floyd Landis sent an e-mail to a USA Cycling official, admitting that he and other former teammates, most notably Armstrong, were guilty of doping. The following month a U.S. federal grand jury investigation into doping allegations against Armstrong was initiated. That year Armstrong finished 23rd in what he had announced, prior to the race's start, to be his final Tour de France. He retired for a second time in February 2011 and thereafter began competing in triathlons. The 2010 grand jury investigation was closed in February 2012 with no criminal charges filed against Armstrong.

In June of that year, the U.S. Anti-Doping Agency (USADA) alleged that Armstrong and five of his associates—three doctors, a manager, and a trainer—had been part of a decade-long doping conspiracy beginning in the late 1990s. According to USADA, Armstrong used performance-enhancing drugs—including erythropoietin (EPO) and human growth hormone—and distributed drugs to other cyclists. USADA also accused Armstrong of having undergone blood transfusions and testosterone injections. The allegations resulted in his immediate ban from triathlon competitions. In August 2012 he declined to enter USADA's arbitration process, which led the agency to announce that it would strip him of all his prizes and awards from August 1998 forward—including his seven Tour de France titles—and enact a lifetime ban from cycling and any other sport that follows the World Anti-Doping Code. Armstrong stated that his decision to no longer contest them was not an admission of guilt but was instead a result of his weariness with the process. Despite Armstrong's continued protestations of his innocence, the evidence of his doping was so overwhelming that in October 2012 he was officially stripped of his titles and banned from the sport when the UCI accepted USADA's findings. In January 2013, during a televised interview with Oprah Winfrey, Armstrong finally admitted to taking performance-enhancing drugs from the mid-1990s through 2005.

Apart from his racing career, Armstrong dedicated himself to campaigning for cancer awareness and established a foundation to further that goal. His Lance Armstrong Foundation became one of the largest organizations funding cancer research in the U.S., and the foundation's iconic yellow rubber "Livestrong" bracelet was a trendy fashion accessory for a time in the early years of the 2000s. However, in the wake of his doping scandal, he stepped down as the foundation's chairman and as a member of its board of directors, and the charity officially changed its name to the Livestrong Foundation. He published the memoirs *It's Not About the Bike: My Journey Back to Life* (2000) and *Every Second Counts* (2003), both co-authored by Sally Jenkins

10.5.1 Concept & Classification of Doping

Doping refers to an athlete's use of prohibited drugs or methods to improve training and sporting results. Steroids are the drugs that often come to mind when we talk



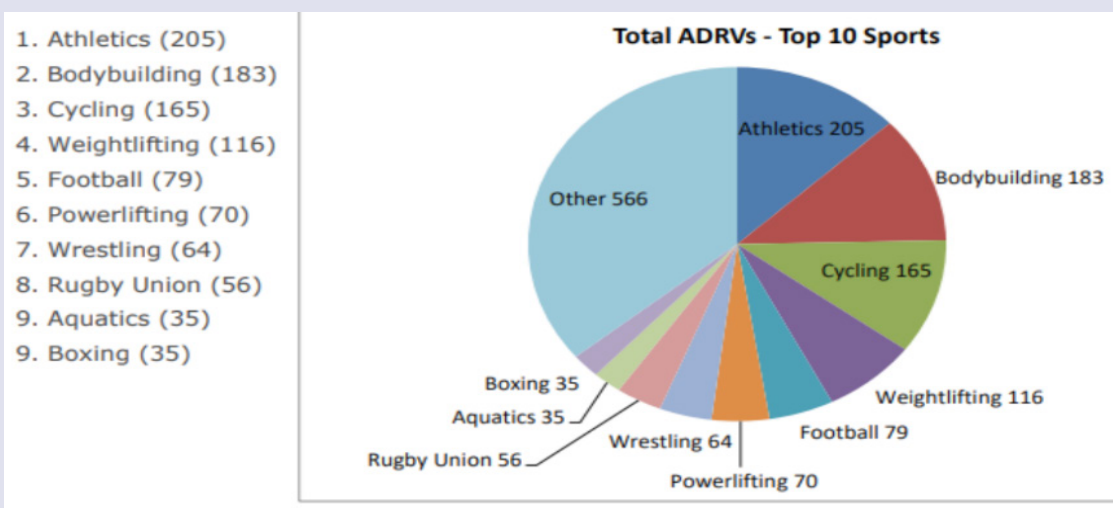
about doping. In addition, doping also includes an athlete's use of other forbidden drugs (such as stimulants, hormones, diuretics, narcotics, and marijuana), use of prohibited methods (such as blood transfusions or gene doping), and even the refusal to take a drug test or an attempt to tamper with doping controls. The IOC defines doping as the use of any method or substance that might harm the athlete in a quest to gain an unfair advantage over their fellow competitors.

Hence, training at altitude to increase the blood's ability to carry oxygen is allowed, but using drugs such as EPO to achieve the same result isn't. The controversy in 'Le Tour de France', and the Atlanta games of 1996, have shown the use of doping to be widespread. However, doping isn't a new trend bought on by the advent of modern pharmaceutical agents. History shows that athletes in the ancient Olympic games were willing to take plant extracts to better their competitors.

Do you know?

Doping was punished even in ancient times. If athletes were caught cheating, they were banned from the games and their names were often engraved into stone and placed in a pathway that led to the stadium. To this day, those stone pedestals line the entranceway to the Olympic stadium in Olympia, Greece, the site of the ancient Olympics (776 BC-394 AD). Inscribed on each pedestal is the name of the offending athlete, his wrongdoing, and the names of family members.

Sports with the highest number of Anti-Doping Rule Violations (ADRVs)



International Olympic Committee defines doping as "the use of any method or substance that might harm the athlete, in a quest to gain an unfair advantage, over his/her fellow competitors." In other words, it can be said that doping is the use of such substances or methods that are custom-made to increase the abilities of an athlete, both physical and mental, and/or to cover the use of such substances while in training.





According to World Anti-Doping Agency (WADA), "Doping is defined as the occurrence of one or more of the anti-doping rule violations set forth in Article 2.1 through Article 2.8 of the anti-doping code (WADA code effective from 1 Jan 2021). These are as follows:

- I. Presence of a prohibited substance or method.
- II. Use or attempt to use a prohibited substance or method.
- III. Refusing to submit sample collection after being notified.
- IV. Failure to file athlete's whereabouts after being notified.
- V. Tampering with any part of the doping control process.
- VI. Possession of a prohibited substance or method.
- VII. Trafficking a prohibited substance or method.
- VIII. Administering or attempting to administer a prohibited substance or method to an athlete.

Thus, according to the anti-doping code, doping is not only about using a prohibited substance or method to improve performance but also about breaking any of the rules listed by WADA.

Following are some of the substances and methods used for doping in sports:

"The use of any support or practice that improves athletic performance or physical work capacity. It can be achieved through physical, pharmacological, psychological, nutritional or mechanical means" (Katch et al. 2007).

Do you know?

The World Anti-Doping Code (Code) is the core document that harmonizes anti-doping policies, rules, and regulations within sports organizations and among public authorities around the world. It works in conjunction with eight International Standards which aim to foster consistency among anti-doping organizations in various areas. Every year WADA publishes an updated code every year. The following 2022 list is as follows:

SUBSTANCES & METHODS PROHIBITED AT ALL TIMES

- S0: Non-approved substances
- S1: Anabolic agents
- S2: Peptide hormones
- S3: Beta-2 agonists
- S4: Hormone and metabolic modulators

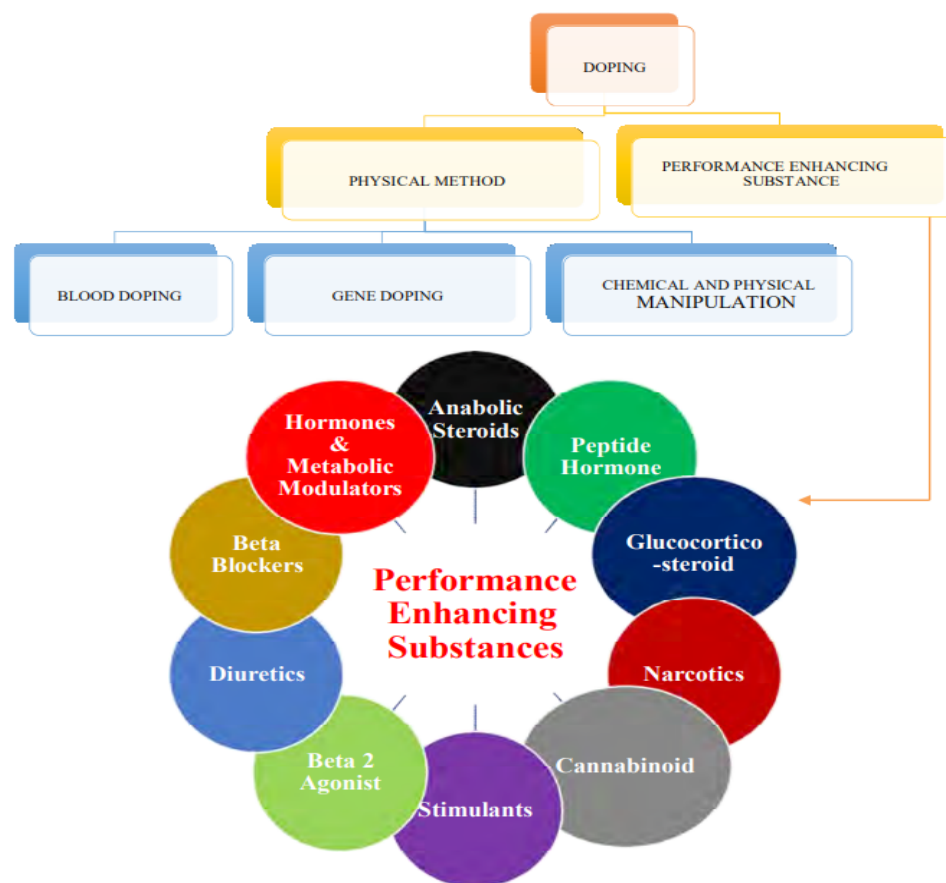
- S5: Diuretics and masking agents
- M1: Manipulation of Blood and Blood Components
- M2: Chemical and Physical Manipulation
- M3: Gene and Cell Doping

SUBSTANCES & METHODS PROHIBITED IN-COMPETITION

- S6: Stimulants.
- S7: Narcotics.
- S8: Cannabinoids
- S9: Glucocorticoids.

SUBSTANCES PROHIBITED IN PARTICULAR SPORTS

- P1: Beta-blockers



Extension Activity

Survey of Doping in Sports

Talk to at least 15 sportspersons or athletes from your school, or a nearby school. You could also talk to people who regularly go to a gym for a workout. Fill up the following questionnaire.





	No	Don't know	Maybe	Probably	Yes
Do you think doping is necessary to achieve the best results?					
Does anyone you know use performance-enhancing drugs?					
Are you aware of the substances you cannot use in competitions?					
Do you think your performance would improve by banned substances?					
Have you ever tried any banned substances to improve performance?					
Are you aware of the side effects of doping?					
Is the NADA doping test available for the tournaments/competitions you participate in?					
According to you who recommends performance enhancing drugs to players?					
Have you felt a pressure to use banned substances?					
Based on the survey above, and your own ideas, make a PPT on Doping and Sports.					

I. Tick the correct options

1. Doping refers to an athlete's use of
 - a. prohibited drugs and methods
 - b. methods to improve training

- c. methods to improve performance.
 - d. Altitude training for oxygen capacity
2. WADA stands for
- a. World Anti-Doping Association
 - b. World Anti-Doping Alliance
 - c. World Anti-Doping Agency
 - d. World Anti-Doping Alumina

II. Answer the following questions briefly.

- 1. Is doping only about using a prohibited substance or is it a method to improve performance? Comment.
- 2. Enlist any three (WADA) Anti-Doping Codes which are mentioned in Articles 2.1 to 2.8. Classify the methods of doping in brief.

III. Answer the following questions in 150-200 words.

- 1. List the rules laid down by WADA in the anti-doping code.

Anabolic Steroids:

Anabolic steroids, also known more properly as anabolic-androgenic steroids, are steroidal androgens that include natural androgens like testosterone and synthetic androgens that are structurally related and have similar effects to testosterone.

Anabolic steroids include testosterone, the male sex hormone, and structurally similar compounds. In addition to increases in muscle mass and bone maturation, these compounds promote the production of creatine phosphate, which allows the athlete to train harder. Other desired effects of anabolic steroids include increased fat-free mass, strength, aggression, and ability to sustain and recover from high-intensity workouts.



Picture Source: <https://teens.drugabuse.gov/drug-facts/steroids-anabolic>





The side-effect of Anabolic steroids

- a) High blood pressure,
- b) Acne,
- c) Abnormalities in liver function,
- d) Alterations in the menstrual cycle,
- e) Decline in sperm production and
- f) Impotence in men,
- g) Kidney failure and heart disease, and
- h) Heightened aggression.

Do you know?

Testosterone was first synthesized in Germany in 1935 and was used medically to treat depression. Professional athletes began misusing anabolic steroids during the 1954 Olympics when Russian weightlifters were given testosterone. In the 1980s, anabolic steroid use began to extend into the general population, and young men began using these substances, sometimes to enhance athletic performance but in most cases to improve personal appearance.

Human Growth Hormone

Human growth hormone (hGH)- also called somatotrophin or somatotrophic hormone is naturally produced in the body. It is synthesized and secreted by cells in the anterior pituitary gland located at the base of the brain.

The primary role of hGH in body growth is to stimulate the liver and other tissues to secrete insulin-like growth factor IGF-1. IGF-1 stimulates the production of cartilage cells, resulting in bone growth, and plays a crucial role in muscle and organ growth. All of these can boost sporting performance.



Picture Source: <https://www.shutterstock.com/video/search/human-growth-hormone>



Side effects Human Growth Hormone

- a) Diabetes in individuals prone to it
- b) Worsening of heart disease and muscle, joint, and bone pain
- c) Hypertension
- d) Cardiac deficiency
- e) Abnormal growth of organs
- f) Accelerated osteoarthritis and
- g) Enlargement of the extremities, such as hands and feet.

Did you know?

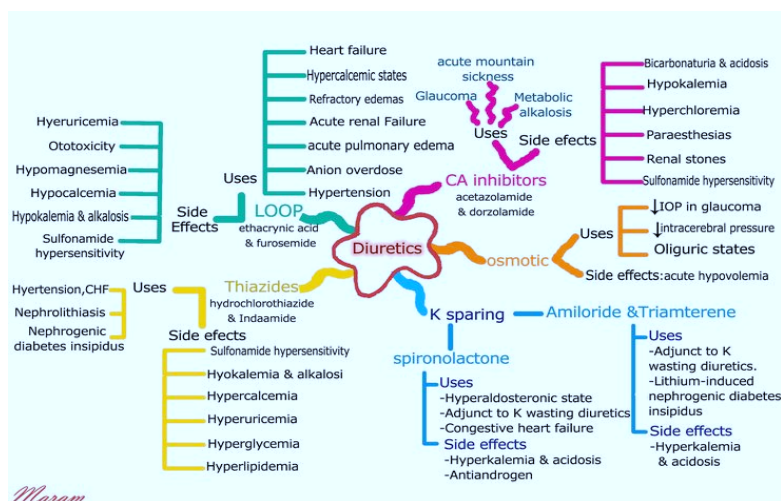
The first human to receive GH therapy was in 1956; it was of bovine origin and was given for 3 weeks for metabolic balance. Studies revealed no effects. Growth hormone (GH) first was isolated from the human pituitary gland in 1956, by both Li and Papkoff, in California, and Raben, in Massachusetts, but its biochemical structure was not elucidated until 1972. In 1958, Raben reported the results of the first trial to show the effects of human GH on growth. By 1960 it was clear that GH-deficient children would benefit from pituitary GH. In 1960, National Pituitary Agency (NPA) was formed to further the goals of coordinating pituitary collection and extraction to support both basic and clinical research.

Diuretics

Diuretics, sometimes called water pills, help rid your body of salt (sodium), and water and inhibit the re-absorption of water in the kidney. Most of these medicines help kidneys release more sodium into the urine. The sodium helps remove water from blood, decreasing the amount of fluid flowing through veins and arteries. This reduces blood pressure. Diuretics can be used in a sport as a masking agent to prevent the detection of another banned substance.

As well as masking other drugs, diuretics can also help athletes lose weight, which they could use to their advantage in sports where they need to qualify in a particular weight category.





Picture Source: <https://www.pinterest.com/pin/727120302308304512/>

Side Effects include:

- Headaches
- Muscle cramps
- Dizziness
- High blood sugar levels
- Abnormal heart rhythm
- Fatigue

Do you know?

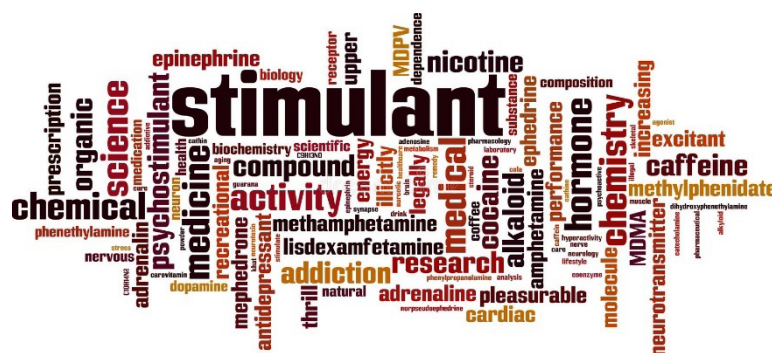
The modern history of diuretics began in 1919 when a medical student at the University of Vienna found that mercurial injections effectively excreted water in syphilitic patients. For decades, these drugs were considered the main weapon to treat oedema, despite their toxicity. Only by the end of the Second World War specialized and advanced studies were conducted, and it was then proved that sulphonamide derivatives had diuretic properties.

Stimulants

Stimulants are a group of drugs that result in increased activity in the body. Sometimes referred to as "uppers," these drugs are frequently abused due to their performance-enhancing and euphoric effects. This type of drug speed up messages traveling between the brain and body.

Stimulants speed up mental and physical processes, which can produce desirable

effects in the short term by increasing dopamine levels in the brain. While users may feel great due to the short-term effects of stimulants, long-term abuse of these drugs can have significant consequences. Generally, those who abuse stimulants experience heightened energy levels and enhanced focus. They can make a person feel more awake, alert, confident, or energetic. Stimulants are usually snorted, swallowed, smoked, or injected. Prescribed stimulants are typically taken orally, and the duration of their effects differs depending on the type.



Picture Source: <https://image.shutterstock.com/image-photo/narcotic-word-cloud-hand-marker-600w-1191150307.jpg>

Side effects of stimulants include

- Anxiety
- Tension
- Increased body temperature
- Nausea
- Tremor
- Seizures
- Coma
- Death.

Do you know?

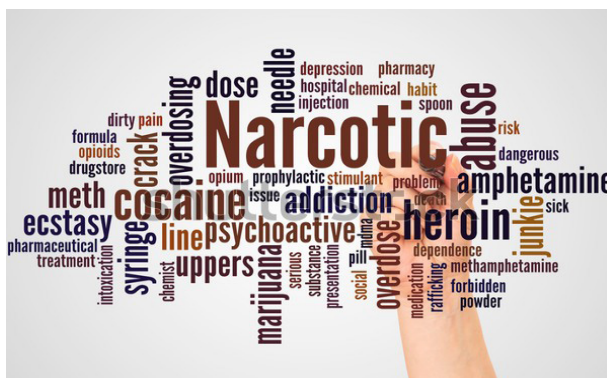
Stimulants, including cocaine and amphetamines, are among the most widely used and abused illegal substances. The first of the synthetic stimulants, amphetamine (isolated in 1887), was first popularized in the 1930s with an OTC nasal decongestant (Bezedrine inhaler) containing the amphetamine phenylisopropylamine and later for fatigue, narcolepsy and depression.





Narcotics

Narcotics are drugs that can change a person's psychic and physical status through a wide range of symptoms, from sleep to euphoria and excitement. Narcotics are a type of drug injected into a human's bloodstream, muscles, or under the skin and can also be swallowed. The main effect of narcotics is to reduce, eliminate, and hide the pain.



Picture Source: <https://image.shutterstock.com/image-photo/narcotic-word-cloud-hand-marker-600w-1191150307.jpg>

Side effects of narcotics are

- Nausea
- Vomiting
- Constipation
- Sweating
- Mental confusion and drowsiness
- Affect Cardiovascular, respiratory, and central nervous systems.

Do you know?

Narcotics occurring naturally in the form of opium derived from poppy have been used since ancient Greek times, both for relieving pain and for producing euphoria. Extracts of opium were smoked, eaten, or drunk (as laudanum, a crude mixture of alcohol and opium). The pharmacologically active components of opium were isolated during the first half of the 19th century. The first was morphine, isolated by a young German pharmacist, F.W.A. Sertürner, in about 1804. A much milder narcotic, codeine, was in turn isolated from morphine.

Blood Doping



Blood doping or “blood manipulation” is a prohibited method of improving an athlete’s performance by artificially boosting the blood’s ability to bring more oxygen to muscles.

The three widely used types of blood doping are:

- a) Blood transfusions
- b) Injections of erythropoietin (EPO)
- c) Injections of synthetic oxygen carriers

Do you know?

Blood doping started in the late 1960s, but was not outlawed until 1986. While it was still legal, it was commonly used by middle and long-distance runners. The first known case of blood doping occurred at the 1980 Summer Olympics in Moscow as Kaarlo Maaninka was transfused with two pints of blood before winning medals in the 5 and 10 kilometre track races, though this was not against the rules at the time.

Blood transfusions

The most basic method of increasing the amount of haemoglobin of an athlete is through blood transfusion. There are two forms of blood doping: autologous and homologous.

Autologous blood doping is the transfusion of one’s blood, stored, refrigerated, or frozen until needed.

Homologous blood doping is the transfusion of blood that has been taken from another person with the same blood type.

Although blood transfusions for blood doping date back several decades, experts say its recent resurgence is probably due to the introduction of efficient EPO detection methods.

Do you know?

The history of blood transfusion originated with William Harvey’s discovery of blood circulation in 1628. The earliest known blood transfusions occurred in 1665, and the first human blood transfusion was performed by Dr. Philip Syng Physick in 1795. The first transfusion of human blood for the treatment of haemorrhage was performed by Dr. James Blundell in London in 1818. The first blood bank was established in Leningrad in 1932, and the first blood bank in the United States opened at Chicago’s Cook County Hospital in 1937.





Injections of Erythropoietin (EPO)

Erythropoietin EPO is a peptide hormone produced naturally by the human body. EPO is released from the kidneys and acts on the bone marrow to stimulate red blood cell production, and this hormone regulates the number of red blood cells in the body.

Athletes inject EPO to increase the concentration of red blood cells and their aerobic capacity.

Do you know?

Human EPO was first isolated from the urine of anaemic patients in 1977, and its gene was later isolated in 1983. One year later, 2 groups succeeded in cloning the EPO gene and expressing it in Chinese hamster ovary (CHO) cells, enabling development of recombinant human EPO (rHuEPO) as a drug.

Injections of Synthetic oxygen carriers

These are chemicals that can carry oxygen. Athletes use synthetic oxygen carriers to achieve the same performance-enhancing effects of other types of blood doping: increased oxygen in the blood that helps fuel muscles. Synthetic oxygen carriers include perfluorocarbons and haemoglobin-based oxygen carriers. These agents effectively transport and deliver oxygen to tissues and have been explored as oxygen carriers in blood-substitute products for purposes such as emergency blood transfusion.

Side effects of blood doping include

- a) Quick increases in blood pressure
- b) Convulsions
- c) Influenza-like symptoms
- d) Increased cancer risk
- e) Liver damage
- f) Increased viscosity of blood
- g) Thickening the blood,
- h) HIV
- i) hepatitis B



j) hepatitis C

k) Heart disease, stroke, and cerebral or pulmonary embolism.

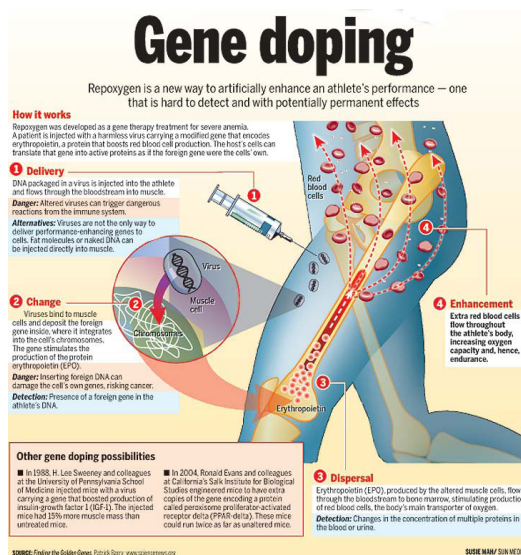
Do you Know?

Artificial oxygen carriers were initially developed as “blood substitutes” in the 1980s and 1990s. Artificial oxygen carriers can be grouped into haemoglobin-based oxygen carriers (HBOCs) and perfluorocarbon-based oxygen carriers (PFCs).

Gene Doping

Gene doping is a form of drug abuse in sport in which genetic material is injected into the muscle to improve someone’s performance or make their muscles grow stronger. According to World Anti-Doping Agency (WADA). Gene doping is the transfer of nucleic acids or nucleic acid sequences and the use of standard or genetically modified cells.

Advancements in gene therapy for medical reasons mean potential cheats might seek to undergo procedures to modify their genes to enhance their physical capabilities. Genetic enhancement includes manipulating genes or gene transfer by healthy athletes to improve their performance physically. Genetic enhancement includes gene doping and has the potential for abuse among athletes. It is said that gene doping could be used to increase muscle growth, blood production, endurance, oxygen dispersal, and pain perception.



Picture Source: <https://genedopingkondapi.weebly.com/what-is-gene-doping.html>

Side effects of Gene Doping include



- a) Cancer
- b) Autoimmunization
- c) Heart attack.
- d) Increased blood viscosity
- e) Difficult laminar blood flow through the vessels
- f) Severe immune response
- g) Abnormal vision
- h) Headache
- i) Nausea
- j) Vomiting

Do you know?

The concepts of gene therapy arose initially during the 1960s and early 1970s. The history of concern about the potential for gene doping follows the history of gene therapy, and the medical use of genes to treat diseases, which was first clinically tested in the 1990s. In 1999, the field of gene therapy was set back when Jesse Gelsinger died in a gene therapy clinical trial, suffering a massive inflammatory reaction to the drug.

I. Tick the correct options

1. The performance enhancement drug generally used by boxers and judo players to reduce their weight is
 - a. Diuretic
 - b. Peptide hormone
 - c. Anabolic steroid
 - d. Beta-2 agonist
2. Stimulants benefit performance by
 - a. increasing heart and respiratory rates and suppressing the symptoms of fatigue
 - b. having a painkilling and sedating effect
 - c. releasing hormones promoting growth, healing and body repair
 - d. preventing the release of adrenaline





3. Some of the side effects of using narcotics include
 - a. suppressed appetite, increased blood pressure, and body temperature
 - b. addiction, suppressed appetite, toxicity
 - c. impotency, infertility, arteriosclerosis, heart disease, liver and kidney cancer
 - d. a damaging effect on endurance, heart disease
4. The full form of NIDA is
 - a. National Institute of Drug Abuse
 - b. National Institute of Dramatic Art
 - c. National Institute of Developmental Administration
 - d. National Institute of Drug Anabolic
5. The term psychoactive refers to
 - a. a drug that alters mood, cognition and/or behaviour.
 - b. a drug that lowers the threshold of pain.
 - c. a particularly active psychopath.
 - d. a drug-induced hallucination.
6. When you are dealing with the people of Substance abuse, what will be your initial step?
 - a. Detoxification
 - b. Supportive Environment
 - c. Rehabilitation
 - d. Medication

II. Answer the following questions briefly.

1. Players using peptide hormones to enhance performance suffer from serious side effects. What are these side effects?
2. List the names of prohibited substances according to WADA (latest).
3. While it is easy to reduce weight through a diuretic substance, it may have serious consequences. Explain the side effects associated with diuretics abuse?





4. What is a prohibited substance? How does it affect the sports person's performance?
5. Define substance abuse.
6. How can you identify the sports person who is suffering from substance abuse?
7. What do you understand by the term Rehabilitation?
8. List the signs and symptoms of substance abuse.

III. Answer the following questions in 150-200 words.

1. Adopting illegal ways to enhance performance by taking Performance Enhancing Drugs may lead to severe side effects. List the major side effects of Doping.
2. Explain any two doping steroids. Mention five side effects of each.
3. What do you understand by substance abuse. List the health issues arising out of use of psychoactive drugs.
4. Discuss your views on Doping.
5. With training in sports, how we can achieve the target to produce better results in 2024 Olympic Games. Share your views

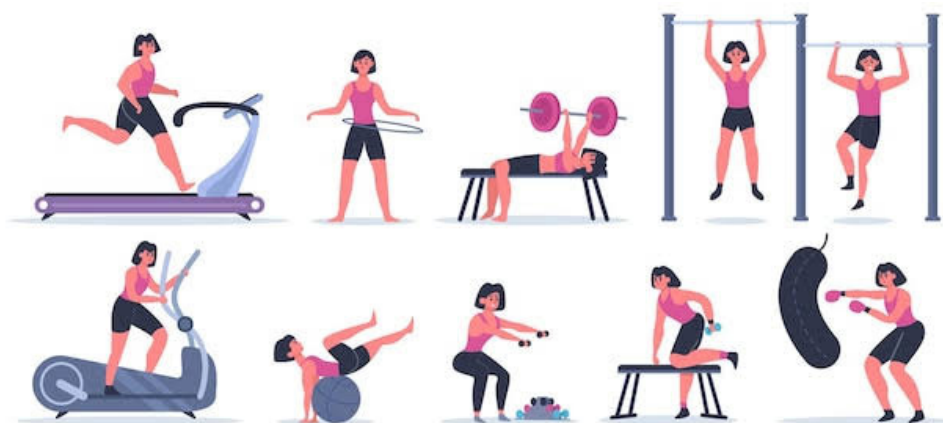
IV. Complete the table regarding Doping in Sports.

Substance	How it is taken	Reasons for taking it	Harmful effects
Anabolic Steroids			
Peptide Hormone			
Glucocorticosteroid			
Narcotics			
Cannabinoid			
Stimulants			
Beta 2 Agonists			
Diuretics			

Beta Blockers			
Hormones and Metabolic Modulators			

V. CASE STUDY

Training and Doping in Sports



Solis was identified by his basketball coach as a talented player. He was thus asked to come daily in the morning for coaching with the school team members. He was explained about training principles and use of techniques and skill development.

- List down any four principles of sports Training.
- What could be the causes of overload?
- What are the factors affecting recovery?
- A training plan is constructed by incorporating various training cycles. A micro cycle may last from _____ days.
- Principle of _____ helps in incorporating the law of readiness.

VI. ART INTEGRATION - MAKING POWERPOINT PRESENTATION

Staging A Play About Fair Play in Sports

Games and contests become opportunities to strive - with opponents - for excellence. Those who cheat or take performance-enhancing drugs do not play the game. Fair Play means more than just following the rules.





A sportsperson who plays fair:

- Respects the Rules
- Respects the officials and accept their decisions
- Respects opponents
- Gives everyone an equal chance to participate
- Maintains self-control at all times

Choose a situation where an athlete

- Broke rules
- Cheated/took drugs
- Or, helped an opponent.



Write a play about her/him.

Perform the play during the Special Assembly of your school.

Suggested Reading

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