

Fashion Studies

Class XI
Learning Resource
Text Book



CENTRAL BOARD OF SECONDARY EDUCATION

Delhi

in collaboration with

NATIONAL INSTITUTE OF FASHION TECHNOLOGY

Delhi

नया आगाज़

आज समय की माँग पर
आगाज़ नया इक होगा
निरंतर योग्यता के निर्णय से
परिणाम आकलन होगा।

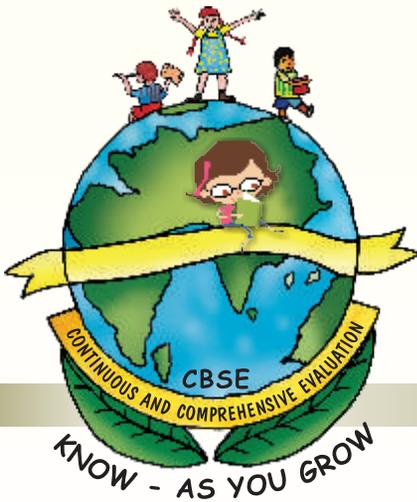
परिवर्तन नियम जीवन का
नियम अब नया बनेगा
अब परिणामों के भय से
नहीं बालक कोई डरेगा

निरंतर योग्यता के निर्णय से
परिणाम आकलन होगा।

बदले शिक्षा का स्वरूप
नई खिले आशा की धूप
अब किसी कोमल-से मन पर
कोई बोझ न होगा

निरंतर योग्यता के निर्णय से
परिणाम आकलन होगा।

नई राह पर चलकर मंज़िल को हमें पाना है
इस नए प्रयास को हमने सफल बनाना है
बेहतर शिक्षा से बदले देश, ऐसे इसे अपनाए
शिक्षक, शिक्षा और शिक्षित
बस आगे बढ़ते जाएँ
बस आगे बढ़ते जाएँ
बस आगे बढ़ते जाएँ.....





Fashion Studies



TEXT BOOK

CLASS

XI



CENTRAL BOARD OF SECONDARY EDUCATION

Shiksha Kendra, 2, Community Centre, Preet Vihar, Delhi-110 301 India

Fashion Studies



Text Book on Fashion Studies Class XI

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भारत का संविधान

उद्देशिका

हम, भारत के लोग, भारत को एक सम्पूर्ण ¹[प्रभुत्व-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

और ²[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 एतद् द्वारा 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 प्राणिमात्र 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 (12.12.2002) से अंतः स्थापित।

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)



Fashion Studies



Foreword

India is known for its rich heritage of textiles and costumes. The global interest and demand for Indian textile and craftsmanship has led to an emergence for huge apparel industry for domestic market and export.

The large scale production of ready-to-wear clothing has led to setting up of manufacturing units and export houses, requiring trained professional to lead the design activity and product development and coordination. The Indian apparel industry is spreading and growing by leaps and bounds providing employment to over a million people.

In response to the above the subject FASHION STUDIES is being introduced at Senior Secondary level as an independent elective subject in the academic stream. A student will have the option to take this subject in combination with other subjects. The course portrays up-to-date basic concepts, techniques, application and some classroom practical. The publication in hand is the main course book, which covers all necessary information essential to understand the principles of 'Fashion Studies' included in the syllabus. Further, guidelines in project work will be developed to enable the teachers for effective transaction of curriculum.

The subject has been developed in collaboration with NIFT (National Institute of Fashion Technology, Delhi). I place on record the services rendered by Shri. P.K. Gera, Director General, NIFT. The NIFT faculty who have contributed as authors of various chapters are Sr. Prof. Banhi Jha, Dean and CBSE Project Coordinator, Professor Kripal Mathur, Project Anchor, Prof. Vandana Narang, Dr. Nilanjana Bairagi, Ms. Ashima Tiwari and Ms. Anu Jain. The initiatives taken by Dr. Sadhana Parashar, Prof. & Director (ART & I) and the efforts made by Dr. Kshipra Verma, Education Officer are highly appreciated in bringing out the publication.

I invite the comments and suggestions from the experts, teaching community to improve upon the curriculum, textual material and other related matter.

Vineet Joshi
Chairman

Fashion Studies



Preface

Fashion theory and practices are built on an academic foundation where history, anthropology, sociology, psychology and economics intermingle to shed light on clothing as one of the three most essential needs of the human race. It is a visual indicator of the cultural identity of a country.

Fashion is a dynamic force which influences lifestyle choices made by consumers. It drives international trends in a multitude of areas from apparel, accessories, automobiles, cuisine, wellness, vacations and more. Glamour notwithstanding, fashion is a serious global business with high financial stakes. The increasing references to Indian textiles, clothing and culture on international ramps are indicative of India being centre-stage on the global fashion map.

The current educational scenario provides students with a wide range of subjects that are informative and also encourage individual aptitude. Many want to pursue non-traditional careers where creativity, problem-solving and business acumen integrate into an exciting combination. Fashion Studies, introduced by CBSE at the 10+2 level as an elective academic subject, points in the direction of fashion as a creative and challenging career.

Fashion Studies offers insight into the components and processes of design, manufacturing, marketing in apparel and textiles. It encompasses the process from fibre to fabric, from concept to creation of garments. It provides an overview of fashion, introduces an understanding of fabrics and surface techniques, design fundamentals and elements of garment-making.

Fashion Studies is envisaged to help students to make an informed decision about their future goals.

Sr Prof Banhi Jha

Dean - Academics



Fashion Studies

Acknowledgement

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Mr. Vineet Joshi, IAS
Dr. Sadhna Parashar, Prof. & Director (ART & I)
Dr. Kshipra Verma, Education Officer

NIFT

Mr. Prem Kumar Gera, IAS
Sr. Prof Banhi Jha, Dean (Academic)

Anchor

Prof. Kripal Mathur

Contributors

1. Overview of Fashion: Sr. Prof. Banhi Jha
2. Introduction to Fibres, Dyeing and Printing: Dr. Nilanjana Bairagi
3. Design Fundamentals: Prof. Kripal Mathur
4. Elements of Garment making: Prof Vandana Narang & Ms Anu Jain

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Contents

CHAPTER 1: OVERVIEW OF FASHION

Objectives of the course

- ★ To provide an overview of fashion
- ★ To familiarize students with essential fashion terminology and theories
- ★ To explain consumer segmentation and their roles in defining markets
- ★ To clarify the roles of regulatory bodies and professionals in the garment industry

Learning outcome

After completion of the unit, the students shall be able to do the following:

- ★ Demonstrate their understanding of fundamental aspects of fashion
- ★ Explain appropriate terminology and theories related to fashion
- ★ Explain the process of fashion diffusion across consumer segments
- ★ Explain the roles of regulatory bodies and fashion professionals in the garment industry

Content

- 1.1. Understanding fashion: Introduction and definition
- 1.2. Factors influencing fashion
 - 1.2.1 Dominating Events
 - 1.2.2 Influence of celebrities
 - 1.2.3 Economic factors
 - 1.2.4 Psychological factors
 - 1.2.5 Social factors
 - 1.2.6. Cultural factors
 - 1.2.7. Political events and personalities
 - 1.2.8 Historical inspiration
 - 1.2.9. Geographical factors

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- 1.2.10. Spread of Information Technology
- 1.2.11 Technological advancements in textiles
- 1.3. Key Concepts and Terminology
 - 1.3.1 Art Design and Craft
 - 1.3.2 Trends
 - 1.3.3 Collection
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 - 1.3.6. Avant garde
 - 1.3.7. Mass fashion, Knock-offs and Limited fashion
 - 1.3.8 Classics and fads
- 1.4. Movement and Direction of fashion
 - 1.4.1 Fashion Forecasting
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 - 1.4.3 Fashion cycle
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 - 1.5.1 Trickle-down
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- 1.8. Fashion Regulatory Bodies in India



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- 1.8.1 Ministry of Textiles
- 1.8.2. Advisory Boards
- 1.8.3. Export Promotion Councils
- 1.9. Role of fashion professionals
 - 1.9.1 Fashion Designer
 - 1.9.2. Fashion Technologist
 - 1.9.3. Fashion Merchandiser

CHAPTER II: INTRODUCTION TO FABRICS, DYEING & PRINTING

Objective of the course

- ★ To initiate students into the world of fabrics
- ★ To introduce students to the origin and properties of natural, manmade and synthetic fibers
- ★ To make students aware of spinning, weaving, dyeing & printing

Learning outcome

After finishing the course, the students shall be able

- ★ To identify and differentiate between fabric varieties
- ★ To understand the various processes of fabric manufacturing, dyeing & printing

Course Content

- ★ Uses of fabrics
- ★ Understanding the characteristics and properties of natural, synthetic and manmade fibres.
- ★ Conversions of fibres into yarns
- ★ Conversion of yarns into fabrics using looms.
- ★ Understanding different types of dyeing of fibres and fabrics.

CHAPTER III: DESIGN FUNDAMENTALS

Objective of the course

- ★ To introduce the students to the meaning of design

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- ★ To develop an understanding of Elements of Design and Principles of Design
- ★ To develop and initialize a design vocabulary, an essential tool for practicing as designers
- ★ To develop skills of visualization and communication using design fundamentals

Learning outcome

After finishing the course, the students shall be able to

- ★ Understand the application of the Elements of Design
- ★ Understand the application of the Principles of Design
- ★ Use basic design language
- ★ Translate abstract, sensorial ideas into visual language

Course Content

- ★ Understanding the meaning of design
- ★ Understanding the basic Elements of Design - dot, line, shape and texture
- ★ Understanding the colour Theory - Hue, tint, shade, tone, colour schemes
- ★ The language and psychology of colour
- ★ Understanding the basic Principles of Design- Rhythm, balance, proportion, emphasis

CHAPTER IV: ELEMENT OF GARMENT MAKING

Objective of the course

- ★ To introduce the students to the skill of garment making
- ★ To make them familiar with sewing machine & its various parts
- ★ To make them familiar with the use of other sewing aids
- ★ To teach them basic hand and machine stitches and their applications
- ★ To teach them various simple sewing machine operations

Learning outcome

After finishing the course, the students shall be able

- ★ To work sufficiently with proficiency on the sewing machine



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- ★ To rectify simple problems of the machine faced while stitching
- ★ To stitch different kinds of seams using the sewing machine
- ★ To finish garment edges with hand stitches
- ★ To make gathers, pleats and tucks on the fabric

Course Content

- ★ Introduction to sewing machine, its various parts and functions along with other sewing aids.
- ★ Understanding the maintenance of sewing machine and simple problems and their solutions.
- ★ Develop proficiency in straight and curved seams
- ★ Basic hand stitches - basting, hemming, back stitch, running stitch etc. with their end use.
- ★ Basic machine seams used for stitching or finishing various parts of the garments like plain seam, French seam, flat fell, lapped
- ★ Fabric manipulation like gathers, pleats and tucks



Overview of Fashion

1.1 UNDERSTANDING FASHION: INTRODUCTION AND DEFINITION

Fashion has become an integral part of contemporary society. It is an omnipresent aspect of our lives and is one of the focal topics of the print and electronic media, television and internet, advertisements and window displays in shops and malls, movies, music and modes of entertainment etc. Fashion is a statement that signifies societal preferences created by individual and collective identities. The key to its core strength lies in its *aspiration value*, which means that people aspire to be fashionable. Fashion travels across geographical boundaries, history influencing and in turn, influenced by society.

Though the term 'fashion' is often used synonymously with garment, it actually has a wider connotation. A garment is not fashion merely because it is worn. To become fashion, a garment has to reflect the socio-cultural ethos of the time. As a generic term, fashion includes all products and activities related to a 'lifestyle' - clothes, accessories, products, cuisine, furniture, architecture, mode of transportation, vacations, leisure activities etc.



Fig 1.1 Evening gowns by Sanjeev Sabai Creative Director of Amethlysta Viola

Fashion has emerged as a globally relevant area of academic study which includes various aspects of fashion design, fashion technology and fashion management. Due to the wide range of human and social aspects within its ambit, it is also a topic of scholarly study by sociologists, psychologists and anthropologists.





Its multi-faceted nature leads to numerous interpretations. For an average person, fashion could generally refer to a contemporary and trendy style of dressing being currently 'in' and which is likely to become 'out' by the next season or year. To an economist, fashion presents an ever-changing dynamic scenario because of its potential to make any product obsolete within a certain time span, inducing the desire for replacement even though the newer item may or may not necessarily function better. A sociologist is likely to perceive fashion as a product of socio-economic-political factors prevailing within a country or even globally at a given point of time. For a psychologist, it could be an expression of personality, human behaviour or a reaction to the surrounding environment.



Fig 1.2 Alpana Neeraj SS
2013 show

It is difficult to separate the two sides of fashion - the frivolous from the serious aspects. Beneath the aura of glamour, fashion is a serious business with a well-coordinated cycle of activities from concept to creation of clothing merging the economic aspects of the industry with design. The organization of the fashion industry includes linkages among a wide network of producers of raw material, designers, forecasters, manufacturers, merchandisers, retailers, media persons etc. This is achieved by the *supply chain* which comprises planned activities from raw material sourcing, manufacturing, marketing to sales. Fashion goods are produced for different segments of the domestic market and also for export which generates foreign exchange and stimulates the country's economy. It includes both **domestic trade** which refers to the fashion business within the country and **international trade** which refers to the export-import business. The fashion industry does the following:

- ★ Generates employment and facilitates payment of salaries to employees
- ★ Contributes to the national economy through purchase of materials and services as well as payment of taxes.
- ★ Contributes to the growth of the domestic trade and markets in terms of time, effort and money incurred on account of the raw material, manufacturing and marketing, product creation/innovation as well as promotion/marketing within the country.
- ★ Creates profit for the company and related industries.
- ★ Earns foreign exchange for the country through the international export-import trade.



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Defining Fashion

Malcolm Barnard traces the origin of the word 'fashion' to the Latin '*facere*' which means 'to make' or 'to do'. This includes the dual processes of making and doing, be it clothing or appearance. Fashion has wide-ranging implications, engaging with a multitude of surrounding influences. In simple terms, fashion is a style that is popular in the present time, or a set of trends which have been accepted by a wide audience. The Webster International Encyclopedia 1998 defines fashion as "prevailing style of dress, particularly new designs representing changes from previous seasons". Fashion educationist and writer John Hopkins defines fashion culture as "a system that unites individuals, establishes its own rules and offers a social structure in relation to current conditions and societal norms".

Some of the quotes of fashion designers indicate their philosophy and approach to fashion.

Giorgio Armani: *"I've tried to find a new elegance. It's not easy because people want to be shocked. They want explosive fashion. But explosions don't last; they disappear immediately and leave nothing but ashes... My philosophy is evolution not revolution"*

Ralph Lauren: *"I've never been about fashion and trends. I believe in design that has lasting integrity."*

1.2. FACTORS INFLUENCING FASHION

Fashion expresses the prevailing interests, human motivation and aesthetics in society. It is a vibrant subject incorporating the interplay of social, cultural, psychological, political, geographical, economic, technological factors. In other words, the surrounding stimuli, whether directly or indirectly, result in influencing fashion. By its very nature fashion is transient, subject to continuous change and revival. The human mind tends to become bored with available goods and services and seeks stimulation through novelty and change. This causes a demand for newer products. Human nature is the most important and essential driver of changing fashion and trends; fashion reflects the human condition with its wants and needs which designers attempt to anticipate in advance and create products accordingly.

The example of mobile phones would explain the point where simple acts of making and receiving calls and texts are inadequate to hold consumer interest. Today mobiles have features like sleek forms and a wide range of inbuilt functions. Manufacturers compete with each other, innovating forms and functions by adding new 'apps' to entice customers by turning the mobile phone into a personal manager/ entertainer/ companion. It thus becomes 'fashionable' to claim that one possesses the



latest updated version of a particular mobile which may even mean replacement of a perfectly functioning piece of equipment. The mobile phone has also been elevated from the status of a utilitarian object to a luxury fashion product by using precious metals and encrusting with expensive stones and diamonds for an elite customer segment.

Fashion is inspired by and responds to *Zeitgeist* meaning 'spirit of the times'. Every new stimulus or development leads to a transformation in society, leading to new fashion cycles and new trends. Some of the influences and thoughts prevailing in society at a particular point in time interact mutually and thereby affect fashion are:

1.2.1 Dominating events

Significant occurrences like war or political events, celebratory, centenary and cultural events, Fashion Week, Fashion Awards ceremony, national and international competitions and games like Olympics, Commonwealth Games or IPL cricket affect the design of the garments and products.



Fig 1.3 Joy Mitra 2011. On the 150th birth anniversary of Rabindranath Tagore, the Nobel Laureate's handwriting was used as a reference for the stylized print

1.2.2 Influence of celebrities

Film stars, sports persons, musicians and others with wealth and power are constantly in the public domain through high visibility coverage in social and entertainment media like movies, TV series, reality shows, interviews and photographs in print media. The dressing style of such celebrities has a significant impact on the public demand for similar designs and brands endorsed by them.



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Fig 1.4 Madhuri Dixit in a Varun Bahl creation

1.2.3 Economic factors

Fashion reflects the global or national state of the economy, whether buoyant or in recession. For example during recession, issues like 'value for money' and durability affect the demand for classic items. There is perceptible buoyant mood in society when the economy is thriving, which results in innovative and Fast Moving Consumer Goods (FMCG). The global effect of devaluation of the dollar, inflation rates, international trade agreements etc. affect manufacturing, marketing and buying patterns. The current global economic recession has resulted in consumers buying practical clothes that provide 'value for money' and are more durable.

In addition to the short-term influences, there is a range of other contemporary factors with long-term effect on fashion:

1.2.4 Psychological factors

While at a fundamental level fashion encompasses a wider lifestyle including clothes and accessories, it affects people at a deeper psychological level playing a crucial role of how we view ourselves and others.

- i. **Duality of fashion:** It can simultaneously express a personal style and also the public image of an individual; it can establish social norms of dress codes and also allow creation of personal identity; it can create commercially viable products for the present and also project a vision for the future.



- ii. **Freedom within social norms:** Fashion allows individuals to express individuality without having to succumb to societal or peer pressure. These differences may be in terms of gender, culture and aesthetics in clothing which are based on prevailing concepts of ideals of beauty.
- iii. **Endless search for novelty:** Since the human mind seeks to counteract boredom through the new, there are choices in every product category available to the consumer through fashion cycles.

1.2.5 Social factors

Fashion emerges as a response to societal influences during a particular period impacting self-identity and group-identity. There are historical examples of fashion which typify a period. Examples are frayed jeans, tie-and-dye shirts and T-shirts during the Hippie movement of the 1960s, the broad-shouldered women's suits reflecting Power dressing of the 1980s, the Grunge look of the 1990s etc. Some of the social factors are:

i. Dynamics of social groups

The domination of economically stronger social groups wields its influence on fashion trends in two ways namely **imitation** and **differentiation**.

Imitation refers to the fact that consumers of the lower social strata aspire to look like the more affluent groups which leads to manufacturing of cheaper or even faux(fake) goods. Differentiation takes place in two ways:

- ★ Differentiation of the upper classes from the masses through a conscious focus on exclusivity of products, original brands, high priced luxury items etc.
- ★ Differentiation among similar products through presentation of a product to highlight its differences and superiority over other products of similar type in order to attract a particular segment of target market. The product is publicized through a strong marketing approach to achieve the following:
 - ★ Appeal to the target consumer
 - ★ Differentiate the product from other products in the category
 - ★ Create desirability in the consumers mind to encourage purchase



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An example is that of a variety of bathing soaps where product differentiation is created by positioning some as beauty products either for the masses or classes while others differentiate themselves as a product catering to individual and family health.

ii. Global issues and concerns

The Bruntland Report in 1987 popularized the term 'sustainable development' elaborating on the need to propagate the use of systems for development that would meet current needs without jeopardizing requirements of future generations. The industrial practices and processes of producing, buying and selling, wearing and disposal in the fashion and textiles sector impacts the environment. The growing awareness and need for sustainable fashion is also indicative of a wider social consciousness about responsibility in the fashion business. In India, initiatives are taken by the government, individual designers and design institutes to work with artisans through fashion-



Fig 1.5 Pero by Aneeth Arora 2013

craft linkages to build a socially responsible sustainable design environment. Health issues and concerns like for HIV/ AIDS or awareness drive about breast cancer symbolized by the pink loop bow are publicized through high-profile events or fund-raising events.

iii. Ethical concerns and practices

The concerns addressed by the international fashion community regarding social and human issues are gaining increased importance in society and by extension, in the fashion industry. Ethical fashion is gaining momentum in order to balance economic considerations with the human aspect of business. Issues pertaining to Fair Trade Practices in the fashion industry like fair wages to workers, decent working conditions, child labour etc. Corporate Social Responsibility (CSR) involving positive social contributions and reduced environmental impact need to be under taken by all companies.



Fig 1.6 Tsunamika is more than a doll; she is a symbol of hope and courage born out of a collaborative initiative by Upasana Design Studio, Auroville to help the Tsunami- devastated villagers of Kerala

1.2.6 Cultural factors

Fashion and culture influence and fuel each other through interaction. This is achieved in the following ways:

- i. **Reflection of both High culture and Popular culture in fashion:** **High culture** includes appreciation of arts, literature, music and customs whether of one's own country or that of foreign land. For example ethnic and national folk costume can provide inspiration for details like fabrics, style or trims in apparel designs. Traditional embroidery of different states often has socio-cultural references through the motifs and use of colour. **Popular culture** includes the influence of advertisements, television, movies, magazines, internet, mainstream music etc.



Fig 1.7. Pankaj and Nidhi 2012 collection based on Polish culture



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- ii. **Expression of gender indicators in different cultures through clothing norms:** In Western culture many traditional garment forms were specifically reserved for one gender e.g. trousers for men and skirts for women. With the relaxation of the earlier rigid social attitudes since 20th century, the roles of men and women have changed. Over a period of time, conventional barriers have been breached wherein fashion for one gender has 'borrowed' components from the other's wardrobe e.g. trouser suits for women.



Fig 1.8 Rajesh Pratap Singh 2012

1.2.7 Political events and personalities

Political events and political personalities affect prevailing fashion. Events like war are echoed across society through T-shirt prints and slogans expressing solidarity and support for the nation. The unification of East and West Germany has created a larger market for European brands like H & M. *Khadi* spun by Mahatma Gandhi in pre-independent India was not just a fabric but a symbol of the desire for independence.

Public personalities associated with politics may, by virtue of their charisma and achievements, evoke people to emulate them through clothing. The jacket with a band collar called *bandhgala* jacket worn by Pandit Jawarharlal Nehru was a popular alternative to the western menswear suit in the 1950s. Lady Diana was a global icon whose style was appreciated for elegance and appropriateness for the occasion.



1.2.8 Historical inspiration

Often historical fashion and styles from museums, archives, design houses or in private collections are researched by designers to identify characteristic style features like silhouettes, fabrics and colours. These are used as sources of inspiration and 'revival' in the following ways:

- ★ Updation and re-interpretation of the key features e.g. an earlier silhouette can be recreated in a new fabric or a different construction technique. These can become the basis of the next collection e.g. royal costumes of princely India have often inspired wedding trousseau-oriented couture fashion shows.
- ★ Research for designing of authentic costumes for movies e.g. Academy award winning designer Bhanu Athaiya had undertaken an intensive process of authentic historical research before designing the costumes for Sir Richard Attenborough's movie '*Gandhi*'.

1.2.9 Geographical factors

History has examples of clothing that developed in consonance with the geography and weather of the area. Brightly coloured Rajasthani clothes visually compensate for the arid desert landscape. Camouflage prints used for military or para-military uniforms are designed to blend in with the surrounding terrain. High desert temperatures also necessitate layered clothing to prevent dehydration. Inhabitants of lands with cold temperatures inevitably need to wear multi-layered clothes made of thicker fabrics. People wear fur for protection against cold weather though the use of fur in fashion receives strong opposition from animal rights activists.



Fig 1.9 Fur overcoat

1.2.10 Spread of Information Technology

Prior to the Information Technology boom, the pace of fashion movement across nations was slower. The internet has accelerated the rate of fashion change reducing the time from the fashion ramps to the stores. Globalization has shrunk the world enabling fashion shows to be globally transmitted live and reducing the life span of fashion trends from a year to a few months. With Skype, geographical boundaries and time lines can be bridged with ease, facilitating international business discussions and quicker decisions. This has also resulted in fashion business becoming '*glocal*' combining global thinking with local flavour, thus developing a wider perspective of the business.



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1.2.11 Technological advancements in textiles

The advent of new technology in textiles is the result of intensive research combining design, clothing, engineering and science by textile technologists. This has enabled the development of technologically advanced 'smart' textiles or 'intelligent' textiles whose functions go beyond the issue of everyday clothing into more varied applications. For example research has provided versatile fabric structures with enhanced performance e.g. fabrics with medicinal properties, wearable technology, designs of spacesuits for extra-terrestrial environment are some examples of technological advancements in textiles and clothing.

EXERCISE 1.1

Fill in the blanks:

1. The word _____ refers to the spirit of the times which influences fashion.
2. The _____ trade refers to the fashion business within the country while the _____ trade refers to the global business.
3. The global fashion business helps the country to earn _____.
4. Research provides versatile fabric structures with enhanced _____.
5. Smart textiles are also referred to as _____ textiles.
6. The key issue in the Brundtland Report in 1987 has resulted in _____ fashion.
7. The domination of economically stronger social groups wields its influence on fashion trends in two ways namely _____ and _____.
8. Faux goods mean _____ products.
9. _____ wages for workers is an example of Fair Trade Practice.
10. Fashion simultaneously incorporates _____ culture and _____ culture.
11. The sequence of planned activities from raw material sourcing to sales is called _____.
12. A buoyant economy results in Fast Moving _____ Goods.
13. The acronym CSR stands for _____.
14. A business strategy combining international thinking with local perspective is termed as _____ approach.



Review Questions

1. Define fashion
2. Explain the factors influencing fashion
3. What are the ways in which fashion is a serious business?
4. What is Sustainable fashion?
5. Name three Fair Trade Practices in the fashion industry?

ACTIVITY 1.1

Background: Corporate Social Responsibility (CSR) also referred to as Corporate Conscience or Responsible Business, is a form of corporate self-regulation integrated into a business model to ensure its active compliance with social contributions which need to be undertaken by corporate organizations and companies.

This activity is intended to enable students to find out about Corporate Social Responsibility (CSR) issues related to the fashion and textile industry.

1. Refer to books, magazines or internet to find out more about CSR.
2. Find out how is CSR relevant in the context of the fashion and textile industry.

1.3. KEY CONCEPTS AND TERMINOLOGY

1.3.1 Art Design and Craft

Art is the process or product of deliberately arranging elements in a way that appeals to the senses or emotions. The term can be used to define a variety of creative activities including *useful arts* (beautiful objects that have functional value), *decorative arts* (objects that have ornamental value), *liberal arts* (study of humanities), *graphic arts* (visual communication) etc.

However the term 'Art' is most used to describe 'creative arts' or 'fine arts' (painting, sculpture, dance, music, film) which expresses the artist's creativity and communicates an ideology to engage or connect with the aesthetic sensibilities and emotions of the audience. In advanced studies there are various theories of art which attempt to define its meaning or provide a historical or social context.



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The New Webster's International Encyclopedia 1998 defines **Design** as the "purposeful arrangement of the elements in a creative work or process. Broadly speaking, the aim of design is to unify function and aesthetics in a harmonious whole". The root of the word 'design' is *disegnare* (French) which means 'to create' or 'to mark'. To design is to conceptualize and plan for a specific end purpose. Everything man-made is designed be it apparel, textiles, products etc. The person who designs in specialized design areas is the designer, referred to as a fashion designer (designs clothes) costume designer (designs for performing arts - theatre and movies) textile designer (designs textiles), interior designer (designs private and public spaces), graphic designer (designs different forms of visuals for communication) etc.

The New Webster International Encyclopedia (1998) defines **Craft** interchangeably with Handicrafts as the "name given to the process of making objects by hand; also refers to the products of the process. Traditional handicrafts include basket-weaving, carpentry, carving, ceramics, embroidery, knitting, sewing and leatherwork". Aditi Ranjan and M.P. Ranjan, authors of '*Handmade in India*' have documented Indian crafts including "mastery of tools, techniques and processes that have evolved over the centuries through social and cultural interactions...which can be harnessed for future development of society".

1.3.2 Trends

Trends are key indicators that directly or indirectly affect and characterize of the look of a season. Trends are transitory fashion statements. Fashion is often affected by seasonal trends which imply that a particular style, silhouette, colour, texture etc. may be dominant at a given point of time leading to a collective societal tendency to wear similar clothes. This aspect is highlighted and re-enforced by the magazines, advertisements etc.



Fig 1.10 Painting titled Cypresses 1889 by artist Vincent Van Gogh.



Fig.1.11 Jacket from graduating Design Collection 1997 by Namrata Joshipura



Trend watching is undertaken as an ongoing activity by fashion forecasters who have professional experience in identification of future trends. Once identified, the trend is 'labelled' i.e. given a catchy theme/ name. This catches the attention of the apparel industry which takes steps to capitalize on this trend and produces its own collection which is called the *coat-tail or bandwagon* effect. Popularized by the fashion leaders, the spread of the trend across market and consumer segments is called a *flow*. The declaration of styles being 'in' or 'out' is publicized by the fashion media. At times it seems that fluorescent colours are 'cool' or that animal prints are 'in' which may give way to earthy colours and foliage prints in the next season. Sometimes bootleg jeans are heralded as the next big trend which could later give way to skinny fits or cropped lengths. Trends are reflected in different design details like garment length, colour, texture, silhouette, cut, fit, garment details (e.g. necklines, collars, sleeves, pockets etc). When there is a prevailing trend, design variations in a multitude of options are seen across consumer segments catering to differences in taste and price points. Eventually, the trend loses its edge and phases out to be replaced by a new trend.

1.3.3 Collection

A collection, also called a *range or line*, refers to a well-defined and diligently-edited group of clothing or products for a specific season. For example this could be a range of blouses with a colour-coordinated focus on design variations of details like collars, necklines, silhouettes, lengths etc. for the ready to wear (RTW) market. Even couture collections of designers are recognized by the trends of the season.

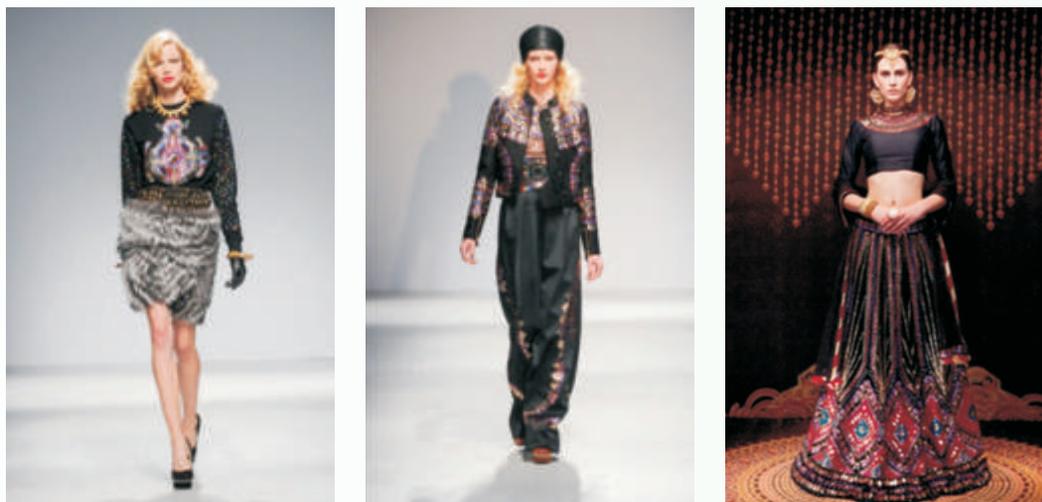


Fig 1.10 Manish Arora 2012 collection



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1.3.4 Style

The word 'style' has varying meanings according to the context:

- ★ Style, also referred to as 'signature style' of a designer or manufacturer/brand may refer to an aesthetic sensibility that distinguishes the designer/ company from others in a similar apparel/ product category. The style may have a characteristic cut, silhouette, fabric, colour palette, surface embellishment, pattern-making, garment construction or finishing techniques associated with the label that attracts its target niche market/ customers. Examples are Tarun Tahiliani, Manish Malhotra, Neeta Lulla and others who design glamorous couture styles which are sought by film actors and socialites.
- ★ Style may refer to a particular design in an export house or buying house which is assigned an identifying 'style number' (rather than a descriptive tag) within the company during the processes of sampling, production and shipping.
- ★ Style may refer to the personal style statement of an individual. A person may like to dress in a particular way, irrespective of whether it is 'in' or 'out'.

1.3.5 Haute Couture and Pret a porter

Haute couture (French) refers to high fashion created by designers known as '*couturiers*'. Couture refers to unique and exclusive creations of fashion customized for individual clients, since the design is never duplicated. The extremely high prices are due to design exclusivity, high quality of fabric, skilled labour used for surface design techniques, embroidery, drape, craftsmanship, garment construction and quality of finish. Globally while couture shows that bring visibility and publicity for the company but the prime source of generation of revenue and profit comes from *licensing* and other products like perfumes, handbags, watches etc. Among the most reputed international couture labels are Chanel, Dior, Versace and Valentino. India has several designers like Ritu Kumar, Tarun Tahiliani, Rohit Bal, Suneet Verma, Sabyasachi Mukherjee, Manish Arora, Manish Malhotra and others in this genre. The main label of most designers is 'eponymous', i.e. the label bears the name of the designer.

Prêt a porter (French) refers to ready to wear (RTW) clothing derived from the couture line or collection of each designer. It reflects the same aesthetics, manufactured with high quality standards, at more affordable prices in multiple sizes in a wider range of colour options or 'colour ways'. This term is widely used now as the fashion retail sector grows and diversifies into different collections in larger quantities.



Designer	Main Label	Pret Label
Ritu Kumar	Ritu	Label
Manish Arora	Manish Arora	Fish Fry, Indian by Manish Arora
Rohit Bal	RohitBal	Balance
Ashish Soni	Ashish Soni	A & S
Tarun Tahiliani	Tarun Tahiliani	TT
Issey Miyake	Issey Miyake	Pleats Please
Donna Karan	Donna Karan	DKNY



Pic 1.12a 'Manish Arora' label

Pic 1.12b 'Indian by Manish Arora' label

1.3.6 Avant Garde fashion

Avant garde (French) refers to the 'advance guard' or vanguard of art and culture which differentiates it from the mainstream. In terms of fashion, it aims at expanding the boundaries of existing norms and aesthetics through experimental and innovative designs. The underlying idea is to showcase these creations as statements of the designer's vision or ideology. These designs are limited in numbers and may not be wearable or commercially viable. The publicity gained from



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avant garde fashion generates enough 'buzz' to sell other products like accessories, hair and make-up. *Avant garde* style is seen in the designs of UK-based designers like Hussain Chalayan, Gareth Pugh; Belgian designers like Martin Margiela, Ann Demeulemeester and others.



Pic 1.13 Circus dress by Manish Arora 2009

1.3.7 Mass fashion, Knock-offs and Limited fashion

Mass or **volume fashion** as the name suggests, is widely available in stores nationwide. These designs are available in a variety of 'colour ways' (options of colours) and sizes, practical and generally affordable by a wide cross-section of society. Global labels like Gap, United Colours of Benetton, Zara, H & M. and Indian labels like *Shoppers Stop*, *Pantaloons*, *Westside*, *W* etc. are examples of brands dealing in large volumes of merchandise.

A close resemblance or reproduction of a designers 'look' by another designer or company usually using relatively cheaper materials and lower production cost is called a **knock-off**. This is a common practice where a popular trend or distinct style of a successful designer/brand is replicated with minimal changes, if any, to lower the cost for moderate level markets. While this gives the opportunity to the larger population to buy popular styles in fashion, it also raises problems of Intellectual Property Rights (IPR) and Copyright Law infringement.

Limited fashion or **Limited Edition fashion** is a reference to the partnership between a brand/store with a fashion celebrity or designer to create an exclusive line of clothing in limited quantities. This is of mutual benefit; on one hand it fosters new design talent providing them with a



platform while on the other it boosts the sales of brand/store since the collections have fresh design approach. For example UK-based Top Shop has partnered with designers Christopher Kane, Emma Cook, JW Anderson and model Kate Moss to create successful limited-edition clothing.

1.3.8 Classics and Fads

Classics are enduring styles that do not become obsolete; instead reaching a plateau of acceptance continuing for a long period of time. Classics have acceptability through minimal modification in design thus retaining a sense of simplicity and timelessness. Examples could include staple fashion items like a crisp white collar shirt, little black dress (LBD) or well-fitted black formal trousers.

Fads are fashions of short duration that peak in popularity due to a fast rate of acceptance by the consumer but have a brief life expectancy with the tendency to become outmoded rapidly. Another characteristic is that they are typically confined to particular social groups. They usually have no forerunner or successor. They tend to begin at lower prices, are not expensive to copy or produce and therefore the market gets saturated easily. Examples are fluorescent coloured T-shirts, ankle or calf length jeans with turn-up cuffs, baggy anti-fit jeans etc.

EXERCISE 1.2

Fill in the blanks:

1. Designers of high fashion/couture are called _____.
2. Designs that characterize of the look of a season are called _____.
3. The spread of a trend across markets and consumer segments is called _____.
4. Unconventional design at the vanguard which differentiates it from mainstream designs is referred to as _____ designs.
5. The steps taken by the apparel industry to capitalize on a trend and produce a new collection is called a coat-tail or _____ effect.
6. _____ are fashions of short life expectancy.
7. _____ are enduring styles that continue for a long period of time without becoming obsolete.
8. Choices of designs in a variety of colour ways and sizes at affordable prices characterize _____ fashion.



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9. A collection is also called a _____ or _____.
10. A _____ label is one where the name of the designer and the label is the same.

Review Questions

1. In what way do trends function as key indicators that characterize of the look of a season?
2. Why are Haute Couture garments so highly priced?
3. What is the meaning of Limited Fashion?
4. What are Knock-offs?
5. Why do designers create avant garde fashion?
6. Compare Classics and fads with examples

Match the columns

Designer	Pret Label
Ritu Kumar	DKNY
Manish Arora	Balance
Ashish Soni	Pleats Please
Tarun Tahiliani	A & S
Issey Miyake	Label
Donna Karan	Fish Fry

ACTIVITY 1.2

Background: The labels of most brands and designer labels bear their names. The stature and reputation of the label is associated with high prices attributed to design exclusivity, craftsmanship of fabric embroidery, garment construction and quality of finish. The *Prêt a porter* (pret) or Ready to wear (RTW) label of a designer usually derives from their couture lines reflecting similar aesthetics and is available at more affordable prices in multiple sizes in a wider range of colour options.

This activity is intended to familiarize students with designer labels and brands.

1. Identify any one Indian designer of who has both a main label and a pret label.



2. Refer to fashion magazines to find pictures of designs under the respective labels.
3. How are the designs of the main label and pret label differentiated from each other?
4. Discuss in class if all designers have both main and pret labels.

1.4. MOVEMENT AND DIRECTION OF FASHION

Fashion spreads in different directions through different media. Some examples are:

- i. Print media e.g. magazines, newspapers and catalogues
- ii. Electronic media like fashion television and their websites e.g.
Fashion TV - www.fashiontelevision.com
Video fashion - www.videofashion.com
- iii. Celebrity styles in public events and brand endorsements
- iv. Websites covering runway fashion e.g. www.style.com/vogue and www.firstview.com.
- v. Fashion trend-spotting websites like www.stylesight.com and www.trendwatching.com

The 'movement' of fashion refers to indicators of speed and is related to the direction of future trends. To understand its implication in the fashion industry, it is important to know about fundamental concepts of Fashion Forecasting, Pendulum Swing and Fashion Cycles.

1.4.1 Fashion Forecasting

Fashion Forecasting is a complex activity where research and analysis of previous fashion trends help in identification of future trends. It is a method by which the activities of fibre, yarn, fabric and apparel producers as well as retailers are coordinated.

The work of trend identification for the apparel, cosmetics and home textiles industry by trend forecasters requires the following:

- i. Trend chasing and trend spotting by professionals who are alert to new socio-cultural influences and technologies across the globe.
- ii. Frequent travel to leading fashion capitals like London, New York, Paris and Milan and other countries/continents to 'pick up' i.e. locate trends.



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- iii. Scouting for new developments in fibres, yarn, fabric developments and new research on colour.
- iv. Study shifting patterns in consumer behaviour, fashion preferences and lifestyle which signal future trends in consumer preferences.
- v. Experience to analyze the information to identify emerging patterns.

Forecasting is a collective activity of specialists who analyze the information and identify what they consider to be the potential key trends for the next season/ year. Their findings are then analyzed and compiled by the forecasting agency which publishes forecast *trendbooks* which predict future trends 6 to 18 months in advance. These forecast books and periodicals include colour palettes, fabric swatches, photographs, fashion sketches and specification details to illustrate apparel trends for women, men and children. These are exhibited and presented in trend forecast seminars/fairs/exhibitions and are awaited with anticipation by fashion industry professionals, buyers and retailers. These trend-books are also a reference point for collections of fashion designers for the next season.

It is important to understand that some forecast agencies cater primarily to their domestic market while others have a larger perspective. Examples of reputed names in fashion forecasting are:

- i. **Lidewij Edelkoort** is an expert forecaster for 'Trend Union' based in Paris and also conducts trend workshops in India.
- ii. Trend forecast agencies are Paris-based **Nelly Rodi**, **Peclers**, **Promostyl** from France, **Doneger** from USA and others.
- iii. Colour forecasting services include the **Color Association of the United States (CAUS)** and the **Color Marketing Group (CMG)**.

1.4.2 Pendulum Swing

Fashion is like a pendulum that swings from one end to another. A particular trend becomes outdated when there is no further creative interpretation of the style. This process may take a fashion season or even years. Gradually the thrust of the pendulum begins to reverse its direction, gathering momentum as it moves. This occurs to avoid design stagnation. For example, when the 'seam rise' of jeans becomes minimally low, the pendulum swings towards high rise jeans. In the 1960s when the market was saturated with fitted mini-skirts, the pendulum swung to the other side ushering in long



skirts. In India, the trend of flowing Anarkali-like kurtas in longer lengths teamed with churidar was replaced by fitted, shorter kurtas worn with salwars. When form-fitted 'jeggings' (combination of jeans and leggings) dominated the market, looser straight leg trousers emerged with a completely different silhouette.

Due to the inherently transient nature of fashion, designs inevitably become outdated. Between the two extremities, the designers, forecasters, manufacturers and retailers try to anticipate the direction of fashion change. Thus the fashion pendulum moves from one end to another like a clock. The Pendulum Swing refers to the periodic movement of fashion which gathers momentum as it swings from one extremity to another. This helps an organization with business foresight to strategically plan its range of clothing for the next season.

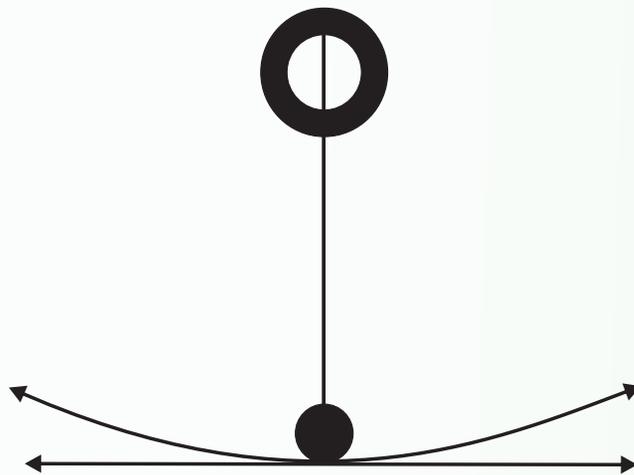


Fig 1.14 Pendulum Swing

Some examples of Pendulum Swing are:

Mini dress <-----> Maxi dress

Low-rise pants <-----> High-rise pants

Bootleg jeans <-----> Skinny jeans



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1.4.3 Fashion Cycles

Fashion is transient and evolutionary in nature; it responds to changes in the socio-cultural milieu by introducing new styles fanned by commercial interests of the fashion industry which play an important role in anticipating and encouraging new fashion. While adopting a contemporary style of dressing may be fashionable, the next cycle of changes initiated by fashion innovators and style leaders is equally inevitable.

The acceptance and discontinuation of a particular style by a larger segment of society is indicated through a bell-shaped curved path called a Fashion Cycle. It has periodicity but has no predictable regularity.

There are 3 kinds of variations:

- i. Duration (length of time)
- ii. Undulations (high and low points)
- iii. Velocity (speed of acceptance and rejection).

There are 3 main cycles - Fad cycle, Standard trend cycle, Classic trend cycle

- i. **Fad cycle:** Fads are fashions of short duration fashions that peak in popularity due to an accelerated rate of acceptance but have a brief life expectancy with the tendency to become outmoded rapidly.
- ii. **Standard trend cycle:** Some recurring cycles, called *long-wave phenomenon*, are reflective of styles that start gradually and sustain for a longer period of time until their popularity eventually decreases.
- iii. **Classic trend cycle:** Classics are enduring styles that reach a plateau of acceptance continuing for a long period of time.

The diagrams of the three fashion cycles explain the phenomenon.

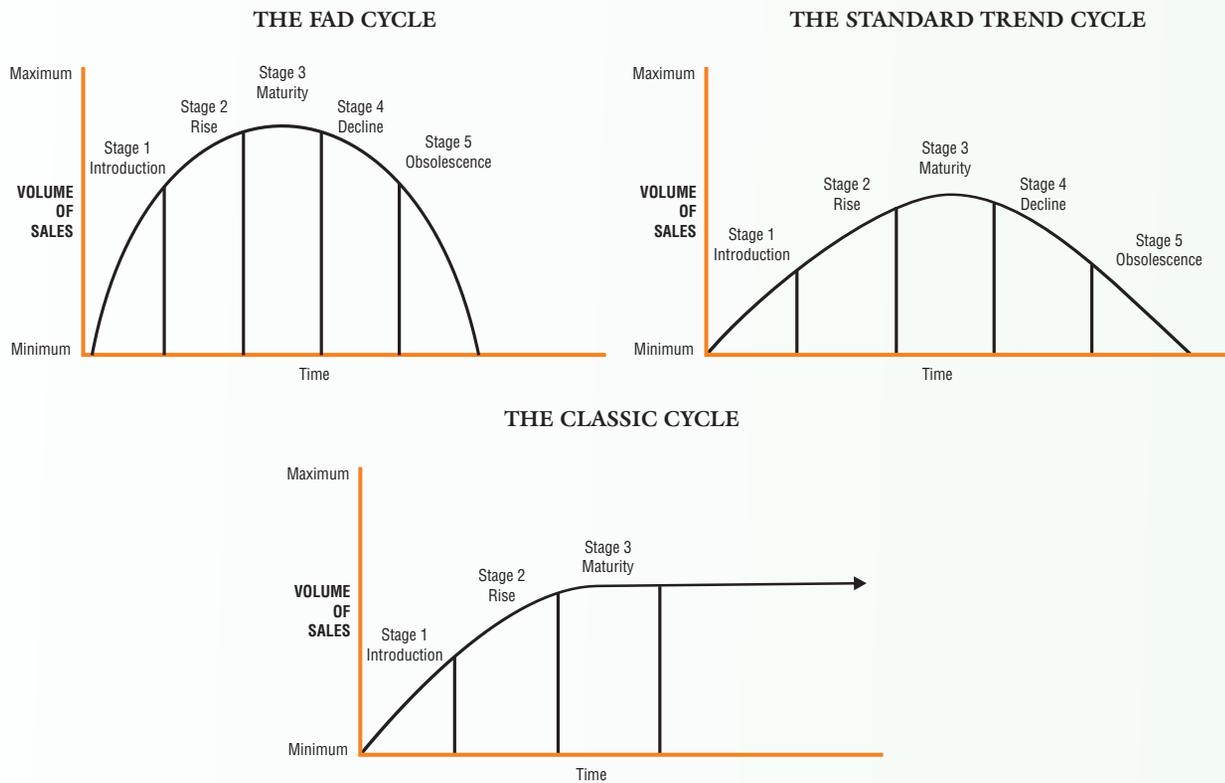


Fig 1.15 Fashion Cycles

Each cycle represented by a bell-shaped curve, is indicated through sequential phases over a period of time:

- i. Phase 1 is the **Introduction** of a style when the fashion-conscious consumers adopt it at the earliest. These consumers are considered to be the fashion leaders whose styles act as signifiers to future trends.
- ii. Phase 2 signifies the **Rise** when the style gets wider acceptance. At this stage the style is adapted by the designers and manufacturers to make it more widely available to the general public. Fashion followers pick up the trend thus increasing the appeal and popularity of the style. This is achieved through media publicity.
- iii. Phase 3 represents the **Peak** of popularity, when the style is widely worn in society. It is the phase when the majority of consumers demand and accept variations of the style at different price points. At this stage, most fashion-conscious consumers who were the early adopters, discard the style because it is widely worn in society.



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- iv. Phase 4 indicates the **Decline** in popularity due to over-exposure of the style. With decreasing number of customers, retailers start offering discounts and sales.
- v. Phase 5 marks **Obsolescence** when the style is considered to be passé i.e. outdated and is therefore rejected.

As shown in the figure, the Fad cycle of a style is characterized by a rapid movement across all the stages and is indicated by a sharp steep curve. Generally this is the result of quick acceptance and equally rapid rejection by the consumers. The Standard Trend cycle is the normal cycle with a gradual downward slide into obsolescence. The Classic cycle is technically not a curve because once a style gains acceptance, it maintains a steady plateau-like popularity. The most basic and timelessly elegant items of clothing are represented by the Classic cycle.

1.4.4 Cycle within Cycle

To capitalize on and cater to the demand of a particular style during the popularity and acceptance stage, different design interpretations and variations in terms of silhouette, colour, material, trims etc. are created. Each of these variations is like a cycle rotating within a larger cycle known as Cycle within Cycle. An example is that of denim jeans which became popular during the 'Gold Rush' in California, has continued as a fashion staple. Yet there are variations in cut (e.g. straight leg, tapered leg, boot leg, baggy), colour (shades of blue and other colours), surface treatments (e.g. acid-wash, enzyme-wash, stone-wash), weight of denim etc. The successful adaptation and adoption of several variations of jeans by both men and women have been 'in' and 'out' of fashion.

1.4.5 Interrupted Cycle

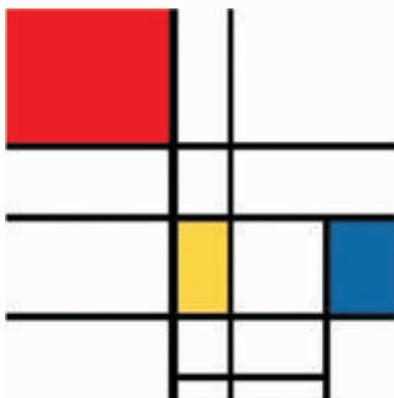
Sometimes manufacturers and retailers decide to stop the production of specific design styles in anticipation of changes in levels of popularity, preferences, seasons or socio-economic-political events like economic recession or war which results in an Interrupted Cycle. This is best explained through changes in fashion during World War II when shortage of fabric forced production of previous styles to be stopped and functional clothing to be adopted for women.

1.4.6 Recurring Cycle

Some styles are so popular that even after the trend has run its course and fades away, it resurfaces through design re-interpretations in terms of silhouette, fabric or detail. This is called a Recurring Cycle. For example, the painting by Piet Mondrian inspired the creation of Yves Saint Laurent in



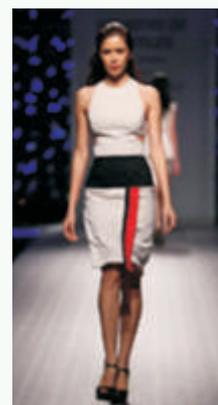
1960s, which was referred to as *colour-blocking*. Several designers have used different design interpretations of colour-blocking as a design feature for Spring Summer 2012 season.



Pic 1.16 Painting by artist Piet Mondrian



Pic 1.17 Colour-blocked dress by designer Yves Saint Laurent in 1960s



Pic 1.18 Atsu Sekhose collection 2012

EXERCISE 1.3

Fill in the blanks:

1. The activity where research and analysis of previous fashion trends help in identification of future trends is called _____.
2. Books and periodicals which predict fashion trends in advance are called _____.
3. The periodic movement of fashion as it swings from one extremity to another like a clock is called _____.
4. A particular trend is said to be _____ when there is no further creative interpretation of the style.
5. The curved path indicating the acceptance and discontinuation of a particular style is represented by a _____ shaped curve.
6. During the popularity and acceptance stage, different design variations create multiple cycles within the larger cycle which is called _____.
7. After a particular trend has run its course, it fades away and resurfaces after a period through design re-interpretation called _____ fashion cycle.



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8. The five phases of a fashion cycle are Introduction, Rise, Peak, Decline and _____.
9. A Fashion Cycle may have unpredictable variations in terms of duration, _____ and velocity.

Review Questions

1. What is Fashion Forecasting?
2. What are the 5 qualities required by a trend forecaster?
3. What is a Pendulum Swing?
4. What is a Fashion Cycle?
5. What are the reasons for variations in a Fashion Cycle?
6. Define the 3 types of Fashion Cycles with diagrams
7. Define Cycle within Cycle through the example of denim jeans

ACTIVITY 1.3

Background: The Pendulum Swing refers to the periodic movement of fashion which gathers momentum as it swings from one extremity to another. This helps an organization with business foresight to plan its range of clothing for the next season.

This activity will enable students to trace the Pendulum Swing in fashion history.

1. Identify any one item of clothing (jeans, skirt, kurta etc.)
2. Find pictures of design variations of this garment.
3. Identify the design component that has undergone the pendulum swing (e.g. length, width, flare etc)
4. Discuss the duration of the trend in class (e.g. months, years etc.)

1.5. THEORIES OF FASHION MOVEMENT

As discussed earlier, changes in the direction of fashion are dependent on trends. Often there are questions on where and how trends originate? Who are the innovators and who are the followers? Is the direction of change vertical (upward or downward) or horizontal? The answers come from the



3 theories that explain and predict the movement of fashion namely Trickle-down, Trickle-up and Trickle-across theories.

1.5.1 Trickle-down Theory

Fashion history shows the royalty and nobility by virtue of their birth, wealth and status were the social elite at the top of the pyramid-like societal structure. This social class led a luxurious lifestyle of entertainment and travel where acquisition of art collections, large houses with expensive furnishings, extravagant clothes and accessories indicated high levels of material consumption. The exclusivity also emanated from the fact that the clothes, hairstyles etc. were so elaborate that the help of attendants and maids was required to get dressed. Therefore high fashion was restricted to those in the highest levels of society. The commoners could admire them but did not have the money or sometimes, even the freedom to wear such clothes. Gradually fashion trickled downward from the upper strata to the lower classes imitated through cheaper versions of the design and fabric by the latter.

Any fashion which starts as high fashion is characterized by the 3 qualities:

- i. Design aesthetics
- ii. Elaborate and exclusive manufacturing process with higher allocation of man-hours
- iii. High quality materials and finishing

High fashion is created by fashion and accessory designers who cater to clients who comprise the fashionable and affluent elite, occupy power positions in business and media, possess the taste and aesthetics for designer clothing and products. Due to its aspirational value, fashion trickles downwards spreading to the lower socio-economic strata. Designer couture creations, accessories and bags are desirable **status markers** (indicators of socio-economic status) but are unaffordable by most. The aspirational value of these labels and brands result in the trickle-down of the design until others have the original product or a facsimile/variations of the design at affordable prices. e.g. couture creations of Manish Malhotra, Sabyasachi Mukherjee or Louis Vuitton bags are desirable status markers.

1.5.2 Trickle up or Bubble up Theory

This theory states that trend inspirations do not necessarily start from the elite class but can start from the masses. In the constant search for novelty, certain styles gradually trickle-up or bubble-up



the social strata. Unconventional styles and experimentation by the youth to provoke attention originates as **street fashion**. An innovative street-style may be 'picked up' (identified) by the trend spotter/trend forecaster which becomes a source of visual inspiration for designers, photographers and stylists. Thus street fashion travels in an upward direction from the street to a designer runway collection. Rugged blue jeans worn during the Gold Rush in California in the mid-19th century has transformed into premium denim jeans costing hundreds of dollars in this century. Mutilated denim jeans have risen from streets to fashion show ramps. Gianni Versace took the humble safety pin and transformed it into a bejeweled accessory for his couture show. The black leather motorcycle jacket as a symbol of rebellious youth was immortalized when film star Marlon Brando wore it in movie *The Wild One*. It was adopted by rock musicians like Jim Morrison and Bruce Springsteen who made it fashionably 'cool' while designers Claude Montana and Gianni Versace presented it on their runway shows.



*Fig 1.19 Play Clan
by Himanshu Dogra*

In India, designers and brands occasionally use images from the street or surrounding environment interpreted through their designs. Manish Arora has often used images of traditional dances, graphics on transport, streets and people in a variety of surface techniques. The brands 'Play Clan' and 'NappaDori' also depict such images in a graphic manner on products and clothes.

1.5.3 Trickle Across Theory

The Trickle-across theory is also referred to as the **Mass Market theory**. It states that instead of a vertical movement, fashion information trickles across horizontally across all social strata and is adopted by different social classes at the same time.

In the Trickle-across mode, the independent designers and in-house design teams of domestic and export companies play significant roles along with the manufacturers, retailers and media, who decide on the styles for mass production and publicity.

The speed with which the trends trickle across different market segments depends on factors like:



*Fig 1.20 Sabyasachi Mukherjee
designs have high popularity
across market segments*



- ★ Turnover rate (rate of replacement of existing merchandise with new styles)
- ★ Mass/volume production
- ★ Speed of fashion awareness and popularization created by the mass media.

With the high speed of communication and technology, fashion trends spread through **knock-offs** by which stores can offer variations of the same styles at different price points to suit the budgets of various consumer segments. This implies that consumers across all strata have the option of choosing from the wide spectrum of product categories. Knock-offs operate in 2 ways:

- ★ A close copy passed off as authentic product
- ★ A close copy which does not bear the original label.

Though this is a common practice in the fashion industry, it inevitably raises ethical questions regarding copyright issues.

EXERCISE 1.4

Fill in the blanks:

1. The Trickle Across theory is also called -----.
2. The Trickle up Theory is also called _____.
3. The rate of replacement of existing merchandise with new styles is called _____.
4. Variations/copies of original designs called _____ are available at cheaper prices to suit different budgets.
5. Street fashion travels in a _____ direction from the masses to a designer collection.
6. The spread of design from the higher to the lower classes through imitation using cheaper versions of fabric is an example of _____ theory.

Review Questions

1. Name the three theories of Movement of Fashion?
2. What is Street Fashion?
3. What are the factors which affect the speed at which trends trickle across different market segments?
4. What are Knock-offs?



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ACTIVITY 1.4

Background: Changes in the direction of fashion are dependent on trends. The source, and process of trends, the innovators and followers, the vertical or horizontal direction and movement of change can be explained by 3 theories.

This activity is intended to enable student groups to trace the movement of fashion and relate to the appropriate theory.

1. Each group will select one fashion theory for detailed analysis.
2. Collect pictures of one item of clothing or an ensemble from photographs or articles from magazines or catalogues.
3. Keep a regular record of the design variations of the item/ensemble reported in the print media with prices, if possible, for a period of a few months.
4. Discuss the relevant theory of Movement of Fashion with the teacher.

1.6 CONSUMER SEGMENTATION

Consumer segmentation attempts to identify clusters of people who share characteristics, usually in the form of demographics, lifestyle attitude and behaviour. Consumers who share characteristics form groups called **cohorts**. For example the young consumer segment can be subdivided into categories based on data like occupation, age, marital status, ethnicity and other characteristics. Young consumers in the same age group, have a collective mind set and shared characteristics, are likely to shop and purchase in similar ways. Similarly generational cohorts are in the same age group being born more or less around the same time and encounter the same socio-economic-political situation prevailing around them. This commonality shapes their relationships and attitudes to other people and products, while sharing common preferences in lifestyle. Some examples are:

- i. **Baby Boomer generation** are those born after World War II (between 1942 -1960) was the first TV generation and likely to have direct or indirect experience of war.
- ii. **Generation X** born between 1961-1981 was the first computer generation.
- iii. **Generation Y** born after 1982 are the children of Baby Boomers and the target of many marketing groups.



A combination of all these groups and their sub-groups comprises the target market. Professional consumer research companies use different data collection methods like focus groups, survey and observation to understand and analyze consumer behaviour and preferences. It is crucial for a company to identify and understand their target consumers who are likely to respond/purchase the products offered.

Segmentation strategies are based on psychographic and demographic data of the target consumers.

- ★ **Demographics** refer to data like occupation, age, marital status, ethnicity as important characteristics that drive consumer attitudes and behaviour.
- ★ **Psychographics** (combining consumer psychology and demographics) are supplementary data which help to identify a consumer segment characterized by common values, attitudes, preferences and behaviour. Health, fitness and nutrition-conscious consumers comprise a relatively small but influential segment of consumers in all categories. Positioning of fashion products is more effective if it incorporates the 'who' of demographics (identification of the consumers) with the 'why' of psychographics (reason for their purchasing choices). Today research of lifestyle patterns forms the foundation for product development and marketing.

The consumer is not a single person but represents a very wide and diverse segment of people. It is this diversity that creates diffusion i.e. spread of fashion across segments of society. Some consumers are fashion leaders while others are followers.

The consumers are broadly categorized into:

- ★ Fashion Influentials
 - ★ Fashion Followers
- I. **Fashion Influentials** also known as **Fashion Change Agents**, play an important role in the initiation and spread/ diffusion of fashion. They establish dress codes and styles followed by others. They are classified into 2 groups - Fashion Innovators and Fashion Motivators:

i. **Fashion Innovators**

Fashion innovators are fashion leaders who sense the spirit of the times and are early adopters of new styles. Though they are a small segment of society, due to their personal charisma, aesthetic sensibility, social position/ celebrity status, financial standing, achievements or personal charisma, they are perceived as fashion role models and style



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icons capable of influencing large segments of the population. This gives their credibility to innovative style statements a sense of credibility and the impetus to start trends.

Fashion leaders are interested and knowledgeable about fashion and are extroverts. They are self-confident in their choices and are also keen on differentiating themselves from others. They are quick to adopt new styles long before they become full-blown trends making them influential within and beyond the social group.

Several kinds of Fashion Influentials comprise this category:

- ★ They may be designers themselves and are therefore the ones who actually create fashion trends.
- ★ They could also be innovators in terms of their personal style statements that challenge prevailing fashion trends.
- ★ They may be socialites or successful professionals like musicians, sports persons or celebrities like movie stars, who wear one-of-a-kind ensembles on the red carpet or for highly publicized events.

ii. Fashion Motivators

They play a role in motivating consumers to adopt new fashion:

- ★ They can be movie stars, models or celebrity professionals who endorse fashion products and brands which are motivating factors for increased purchasing patterns across all social strata.
- ★ They can be media persons and fashion journalists whose articles in newspaper columns, fashion magazines and blogs are avidly read by many. Since they have a passion for the latest fashion, they are considered to be more knowledgeable about some aspects of lifestyle and their opinions matter to others in the group.
- ★ They may be fashion designers who are often interviewed, quoted and asked for advice on fashion and are therefore influential as opinion leaders in their own right.
- ★ They can also be high-end retailers and exclusive boutiques who have the experience and the position to identify the most saleable designers whose creations are then showcased. Their judgment is usually based on the understanding of their clientele and their ability to zoom in on the next big fashion direction.



II. On the other hand are those who belong to a wider cross-section of the consumer base and abide by the dress codes of the majority. They are divided into 2 segments:

i. Fashion Followers

ii. Fashion Victims

i. Fashion Followers

They are the majority of consumers who accept and emulate trends which are firmly entrenched in the market. They feel a sense of comfort in conforming to styles that merge with others in a larger group. Fashion followers may also be those who may not have much of disposable income or have limited time and interest in fashion. Some designers and manufacturers create more variety of affordable styles for this consumer segment. Fashion needs followers without whom it would not gain momentum. For marketing experts, fashion followers are the drivers of mass production of commercially viable fashion in large volumes.

ii. Fashion Victims

This phrase is sometimes used to refer to those who follow fashion trends without exercising their own judgment. This consumer segment is often characterized by high income and high purchasing power. They tend to buy the latest fashion simply because it is expensive or because media or fashion pundits declare it as being 'in'.

EXERCISE 1.5

Fill in the blanks:

1. Consumers who share characteristics form groups called _____.
2. Fashion Change Agents are also known as _____.
3. Marketing experts try to understand the target consumers through analysis of _____ and _____ data.
4. Fashion innovators are also called _____.
5. Those who follow trends without exercising their own opinion, are referred to as _____.



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6. The consumer segment referred to as _____ are the drivers of mass production of commercially viable fashion in large volumes.
7. In order to attract a particular segment of the target market, the positioning and presentation of a product requires _____ to highlight how it is different and better than other products in the category.
8. The spread of fashion across social strata caused by the diversity of the consumer segment is called _____.

Review Questions

1. Define Cohort.
2. What are the two broad consumer segments?
3. What is the role of Fashion Change Agents in spreading fashion?
4. Compare Fashion Victims and Fashion Followers.
5. What are the two broad categories of data needed to understand the target market?

ACTIVITY 1.5

Background: The visibility of fashion influentials like celebrity personalities like film stars, sports persons and musicians or other dominant social groups with wealth, power, culture and leadership is widespread in the public domain. The style quotient of such celebrities has a significant aspirational impact on the public demand for similar designs and fashion brands endorsed by them.

This activity will enable students to relate fashion and brand endorsements to the influence of celebrities.

1. Identify any one celebrity personality who is a Fashion Influential.
2. Examine whether the coverage about the celebrity personality is in the social or entertainment media (movies, TV series, reality shows, advertisements, interviews and photographs in magazines and newspapers etc.)
3. What are clothing or lifestyle brands endorsed by the celebrity?
4. Based on your findings, do you agree/disagree that celebrity status and brand endorsements affect and influence each other?



1.7 INTERNATIONAL TRADE IN FASHION

International Trade also called Global Trade refers to any exchange of goods involving two or more countries. International Trade is about the relationships among nations and cultures in the manufacturing and distribution of products. **Exports** represent goods shipped/airlifted to another country in return for money or other goods by which revenue accrues to the company or government where the goods originate. **Imports** refer to the raw materials brought into a country for production of goods or foreign readymade goods made available for domestic use. In terms of international trade, the textile and apparel industry has emerged as consumption and production hubs. The professionals in this field are responsible for a wide range of activities like merchandising, marketing, design production and distribution which determine product availability across the globe.

The earliest example of international trade was through ancient trade routes where camel caravans brought silk fibre, yarn and fabrics out of China crossing through Middle East to Europe, popularly known as the Silk Route. Textiles were precious commodity traded for goods or services. Even today, international trade enables import and export of goods which generally takes the form of developed countries sourcing textiles and apparel from developing nations where the labour cost is low.

Due to increasing globalization there is a widespread inter-connectedness and inter-dependence among producers and consumers. The textile and apparel business is a source of employment for millions in every country. It is a global trade where processes like weaving and manufacturing may be outsourced to other countries. On one hand are the consumers of textile and apparel products while on the other, are the producers and manufacturers. The global fashion industry is increasingly focusing on responsibility and ethics in fashion, involving the elimination of social exploitation and environmental degradation through pollution, waste disposal means, chemical dumping etc.

Production of textile and apparel has now shifted from developed countries like USA and the European Union to China, India and Bangladesh. The developed nations 'consume' (buy and use) more than developing nations. USA is the biggest importer of apparel in the world followed by Germany and Japan. Future growth in demand is expected from developing nations because of their rising population, urbanization and higher per capita income.

Overall India's textile and apparel exports was estimated to be USD 31 billion in 2011 and growing



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at an annual rate of 10% since 2005. India's share of the world textile and apparel exports currently stands at 4.5% and is expected to rise to 8% by 2020.

EXERCISE 1.6

Fill in the blanks

1. The exchange of goods involving two or more countries is called _____.
2. _____ refer to goods shipped to another country in return for money or other goods.
3. _____ refer to the raw materials brought into a country for production of goods or foreign readymade goods made available for domestic use.
4. _____ addresses the need to balance economic considerations with the human and environmental aspects of the fashion business.
5. _____ is the biggest apparel importing country in the world.
6. Future growth in demand is expected from developing nations because of three reasons namely _____, urbanization and per capita income.

Review questions

1. What is International Trade?
2. What is Imports?
3. What is Exports?
4. In what way is textile and apparel business a global trade?

ACTIVITY 1.6

Background: Global consciousness of ethical fashion involves the elimination of social exploitation and environmental degradation on one hand with the introduction of Fair Trade Practices on the other.

This activity will develop awareness of Sustainable fashion among students.

1. Refer to websites on Sustainable Fashion.
2. What are the issues of prime concern (social exploitation/ environmental degradation/ fair trade practices etc.)
3. Find out about any brand which caters to Sustainable Fashion.



1.8 REGULATORY BODIES IN FASHION AND TEXTILE SECTOR

The textile industry in India is one of the leading textile industries in the world incorporating textile manufacturing and export. The economic liberalization in 1991 gave a boost to this industry. The textiles and ancillary sectors generate direct employment for over 35 million people in India, which makes it the second largest provider of employment in the country, after agriculture. The textile industry is divided into several segments or 'sub-sectors' which include cotton textiles, silk textiles, woolen textiles, handmade textiles, readymade garments, jute and coir.

There are several regulatory bodies in the Indian fashion and textile sector comprising government, semi-government and private institutions:

1.8.1 Ministry of Textiles, Government of India

The overall national-level regulation of the textiles, apparel and handicrafts sectors takes place under the aegis of the **Ministry of Textiles**. It is responsible for policy formulation, planning, development, export promotion and trade regulation in the textile sector. This includes all natural and man-made fibres used to make textiles, clothing and handicrafts.

The Government of India has taken several initiatives including a number of export promotion policies with incentives to broad-base coverage of market-linked product scheme in order to increase the Indian share for textiles and clothing in the global market as follows:

- ★ Welfare schemes to weavers and artisans
- ★ E-marketing platforms and other marketing initiatives to promote niche handloom and handicraft products through different events
- ★ Skill development of people across all sub-sectors
- ★ Financial packages to help handloom sector weavers and cooperative societies
- ★ Textile Parks which facilitate employment to several millions of textile workers in the apparel, hosiery, silk, processing, technical textiles including carpet and powerloom areas. Such industries are supported in the following aspects:
 - ★ Land
 - ★ Common infrastructure like compound wall, roads, drainage, water supply, power plant for electricity supply, telecommunication lines etc.



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- ★ Factory buildings for production purpose
- ★ Machinery
- ★ Buildings for common facilities like testing laboratories, design centre, training centre, warehousing facility, packaging unit, offices of service providers, marketing support system etc.

The objective of the Scheme of Integrated Textile Parks (SITP) is to identify industrial locations with high-growth potential and provide them with infrastructural facilities to set up textile units of international standards.

1.8.2 Advisory Boards

These operate under the aegis of the Ministry of Textiles and include:

- ★ All India Handloom Board
- ★ All India Handicrafts Board
- ★ All India Powerloom Board
- ★ Jute Advisory Board
- ★ Central Wool Development Board
- ★ Central Silk Board

The main task of these Boards is to look after production levels, export and imports, implementation of schemes, providing necessary funds for growth of handloom industry and advising government on matters of implementation of new technologies or trends.

1.8.3 Export Promotion Councils (EPC)

These are non-profit organizations which include:

- ★ Apparel Export Promotion Council, New Delhi
- ★ Carpet Export Promotion Council, New Delhi
- ★ Cotton Textiles Export Promotion Council, Mumbai
- ★ Export Promotion Council for Handicrafts, New Delhi
- ★ Handloom Export Promotion Council, Chennai



- ★ Indian Silk Export Promotion Council, Mumbai
- ★ Powerloom Development & Export Promotion Council, Mumbai
- ★ Synthetic and Rayon Textiles Export Promotion Council, Mumbai
- ★ Wool & Woolen Export Promotion Council, New Delhi

Each EPC is responsible for promotion of a particular group of products, projects and services to enhance exports in these sectors. The functions of these EPCs are:

- ★ To project India's image abroad as a reliable supplier of quality goods and services.
- ★ To assist their member exporters to take advantage of such opportunities for expansion and diversification by providing commercially relevant information and advice on design improvement, technology upgradation standards and specifications, product innovation etc.
- ★ To organize visits of delegates and members abroad to explore business avenues
- ★ To encourage and monitor observance of international standards and specifications by exporters.
- ★ To build a database of India's export-import figures and provide data on international trade.

EXERCISE 1.7

Fill in the blanks:

1. The overall nation-wide regulation of the textiles, apparel and handicrafts sectors takes place under the aegis of the _____.
2. The SITP stands for Scheme of _____ Textile Parks.
3. EPC stands for Export _____ Councils.

Review questions

1. What are the sub-sectors of the textile industry?
2. What are the different regulatory bodies of the Government of India?
3. What are the organizations that promote textile-based exports?
4. Name any 3 initiatives taken by the Government of India to promote exports in textiles and clothing.



ACTIVITY 1.7

Background: The overall national-level regulation of the textiles, apparel and handicrafts sectors takes place under the aegis of the Ministry of Textiles, Government of India. It is responsible for policy formulation, planning, development, export promotion and trade regulation in the textile sector.

This activity is intended to familiarize student groups with the regulatory bodies in fashion and textile sector

1. Refer to the website of the Ministry of Textiles, Government of India and select an Advisory Board or Export Promotion Council.
2. Refer to the website of the selected organization/ council about its role in the textile, clothing or handicrafts sector.
3. Discuss the information with the teacher and the class.

1.9 ROLE OF FASHION PROFESSIONALS

In fashion institutes, a variety of subjects are taught in the streams of design, technology, fashion merchandizing, retailing and management. The course curricula and syllabi are developed to train students to become professionals with knowledge, skills, ability to think creatively and problem-solving. The fashion industry offers a range of career and employment opportunities for graduates in positions requiring creativity, technical competence and retail acumen. Since some of the job responsibilities may overlap, it is critical to have professional interpersonal skills in order to work as a coordinated team.

The industry comprises companies/ organizations each with its specific range of products and services catering to its own clientele/consumer segment. The focus could be on apparel, accessories, design communication, manufacturing, forecasting or marketing. Some cater to the domestic retail market be it brands like Shoppers Stop, Fabindia, Anokhi etc. or the designer clothing segment. In addition the export houses and buying houses manufacture apparel and products only for export and do not retail within the country. This necessitates a well-synchronized flow chart



Fig 1. 21 Students in a Garment Construction lab



of activities by different departments each focusing on a particular area while supporting the other sections and coordinated by a centralized core team. Each company irrespective of whether it is design, technology or marketing oriented, can function at peak efficiency levels only if there are competent professionals within the organization.

The roles of designers, technologists and merchandisers are explained below.

1.9.1 Fashion Designer

A designer could be working in an export house, buying house, a corporate retail company or could be an entrepreneur. He/she could be specialized in clothing for men, women or children. A fashion designer's career in the fashion industry specifically in an export house or buying house, initially begins as an assistant designer with a Head Designer who by virtue of experience and/or long association with the company understands the entire process and is in a position of authority within his/her own department. In an export house, a designer works as part of an extended team that includes a pattern-cutter, sample machinist, garment technologist and merchandiser.

The role of the designer is to undertake the following activities:

- i. To understand the vision and goal of the company, the company-product association in terms of customer perception and positioning in the market.
- ii. To participate in brainstorming sessions with a team of seniors and colleagues for generating ideas and strategies rather than working in isolation.
- iii. To synchronize individual design sensibility with that of other designers within the organization to contribute to a cohesive look of the brand.
- iv. To understand that design is not merely a paper-pencil activity. Design decisions are not only about originality and creativity but equally about commercial realities and financial constraints. Financial implications of details like selection of fabrics, cost and availability of trims, threads, textile surface treatments/ embroidery etc. are equally important
- v. To undertake sampling i.e. making the first sample prototype which incorporates the entire design process from sketch to final product. While the designer will conceptualize, oversee and present the prototypes as part of the new collection, the feedback of other colleagues in design, production coordination, merchandising or marketing is also essential.



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- vi. To develop a focused and cohesive collection which would be in tandem with the Unique Selling Proposition (USP) i.e. the special characteristics of the company/brand and fashion forecast for the next season.
- vii. To understand the importance of time-management since time is equated to money. In export houses this would include calculation of time taken from the point of placement of order by buyers, fabric procurement, production process and shipping of finished consignment as per schedule.

1.9.2 Fashion Technologist

A garment technologist is the interface between the designer, the sample prototype and final finished collection. The technologist works in discussion and coordination with designers, textile technologists, pattern-cutters, production teams and merchandisers. In export houses and retail companies, the first sample is sent to the CMT (Cut Make Trim) unit where a fashion technologist can assess the cost and processes of production.

The role of the technologist is required to undertake the following activities:

- i. To assess the sample created by a designer, suggest suitable modifications if necessary until it is completely as per specifications given by the design team and therefore is ready to go into production.
- ii. To attend meetings with the design team where the sample may be tried on a dress form or on a 'fit model' to review any alterations and make detailed notes for the manufacturing unit to be followed precisely.
- iii. To ensure a rigorous process of quality control.
- iv. To check the results of any fabric tests e.g. colour fastness, shrinkage etc.
- v. To prepare a graded size chart for adherence by the production unit
- vi. To finalize all necessary requirements and create a pack of technical specifications (Tech Pack) as a control measure to avoid deviation during manufacture.
- vii. To carry out inspection and random checks garment while in production.
- viii. To address and resolve technical problems that may be detected during manufacturing.



1.9.3 Fashion Merchandizer

Line planning is an integral creative and commercial activity in the fashion industry which involves planning and creating a range of merchandise for the next season. However the success of the designer in creating the next collection would be less effective without the valuable inputs from merchandizers. It is important to balance commercial viability with good reviews from the customers. A merchandizer is the interface between design and commerce. With the increased competitiveness in the market, the merchandizer has to make critical choices in terms of design and product positioning strategy which will affect the profit margins of the company.

The role of the merchandizer is to undertake the following activities:

- i. To coordinate between the company and retailer to provide a wider platform for the merchandise
- ii. To understand the USP of the company/ brand while analyzing and exploring commercial opportunities in the market to represent the creative team's design vision.
- iii. To undertake market research for trend directions and evaluate market competitors.
- iv. To review the company's sales figures of the previous season by style as per the apparel or product category.
- v. To draw up an in-house merchandising calendar to include key dates and deadlines for different departments to adhere to.
- vi. To discuss the new collection(s) with the team of designers and buyers regarding integration of commercial concerns of costing and pricing with the creative aspects.
- vii. To brainstorm with the marketing team to plan a strategy to position and publicize the new collection.

EXERCISE 1.8

True or False

1. Line planning activity is the single-handed responsibility of the designer.
2. A fashion designer is always an entrepreneur with his/her own label.
3. The responsibility of a fashion designer is to:



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- i. Focus only on design based on originality and creativity
 - ii. Understand the goal of the company in terms of customer perception and its positioning in the market
 - iii. Concentrate on design by isolating oneself from other departments of the organization.
 - iv. Develop a focused and cohesive collection which would be in accordance with the Unique Selling Proposition (USP) of the company/brand
4. The responsibility of a fashion technologist is to:
- i. Undertake sampling
 - ii. Assess the cost and processes of production in export houses and retail companies based on the first sample
 - iii. Provide specifications for the first sample based on which production will be undertaken
 - iv. Ensure a rigorous process of quality control
5. The responsibility of a fashion merchandizer is to:
- i. Coordinate between the company and retailer to provide a wider platform for the merchandise
 - ii. Make critical choices in terms of design and product positioning strategy of the company.
 - iii. Be the interface between design and technology
 - iv. Undertake market research for trend directions and evaluate market competitors

Review Questions

1. What are the activities undertaken by a fashion designer?
2. What is sampling?
3. Who are the extended team members with the fashion designer?
4. Who is a fashion technologist? What are the activities undertaken by a fashion technologist?
5. Who is a merchandizer? What are the activities undertaken by a merchandizer?
6. What is a merchandizing calendar?



GLOSSARY

Accessories:	Articles worn (like jewellery/ hat/ shoes/ belts etc) or carried (e.g. purse etc) to match with clothing
Apparel industry:	Designers, manufacturers, merchandisers, distributors, retailers working in the garment trade
Avant Garde:	French term for design which is unconventional and ahead of its time
Classic:	Long-lasting fashion that outlast seasonal forecast
Cohort:	Consumer segments categorized according to shared characteristics like demographics and lifestyle.
Consumer:	The end user who makes the decision to purchase.
Copyright:	The legal right of a creator of an original concept or style
Collection:	Range of clothing or accessories for a season
Custom-made:	Made to order as per specifications of client. Also called Bespoke tailoring
Disposable income:	Income of a person after tax-deduction which could be spent on consumable items
Fad:	Short-lived fashion that peaks and fades out quickly
Fashion Cycle:	Cyclic repetition of styles from a previous period
Fashion Forecasting:	A specialized activity to predict fashion for the next season(s)
Fashion Seasons:	Bi-annual periods of Spring-Summer and Autumn-Winter according to which fashion collections are planned
Haute Couture:	French term for High Fashion of one-of-a-kind fashion
Obsolescence:	When a product is discarded for something new
Pret a porter:	French term for ready-to-wear fashion
Knockoff:	Copy of a higher-priced garment available at a lower price
Licensing:	Grant of authorization by owner or authority to hold rights or to engage in activities related to the profession
Retailing:	The entire process of buying merchandize from different sources and selling to customers at various points of retail like boutiques or department stores



Fashion Studies

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Staple:	Items of clothing or accessories which are in constant demand
Supply Chain:	A series of sequential stages incorporating the entire process from raw material sourcing, production to marketing
Toile:	Sample garment made in muslin or cheaper fabric
Turnover rate:	Speed of replacement of merchandise with new styles
Zeitgeist (za-it-ga-ist):	German term for 'spirit of the times' indicating the prevailing influences, trends and styles in society at large.

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Introduction to Fibres, Dyeing & Printing

2.1 INTRODUCTION

India is a country with rich heritage of traditional textiles like Banarasi brocade, Kanjeevaram silk, Baluchari silk, Chanderi, Maheshwari sarees, Jamdani cotton sarees, Kashmiri woollen shawls to name a few. Each type of Indian textile has unique features in terms of the fibres or raw material used for production, weaving and dyeing techniques. Some traditional textiles of India have rich embroidery on it like Kantha stitch, Phulkari work, mirror work, Kutch embroidery etc.

This chapter introduces the reader to different types of natural and manmade fibres, basic concept of yarns, basic weaves, fundamentals of dyeing and printing technology.

2.2 TEXTILE FIBRES

By definition a textile fibre is a unit of matter which is usually at least 100 times longer to its thickness. The basic unit of all textile fibres like cotton, wool and silk is the molecule.

The molecules in a fibre are called polymers as they are a long chain of molecules. The polymeric structure gives the required properties to the fibres. Each fibre has its unique properties which are based on the molecular structure and chemical composition.

2.2.1 Classification of textile fibres

Fibres are classified based on origin into natural and manmade fibres. They are further classified based on chemical composition. The classification of textile fibres is as follows:

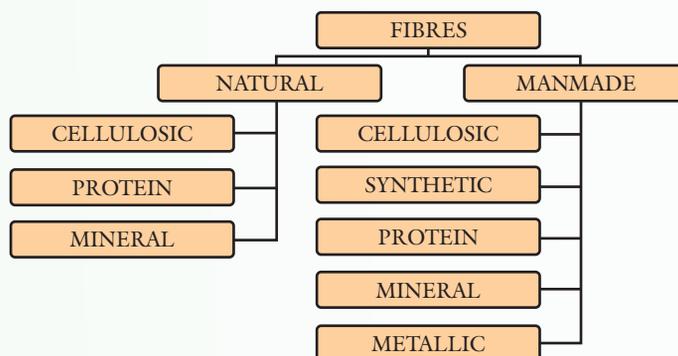


Figure 2.1 Classification of fibres





Table 2.1 Classification of fibres with examples

Fibre type	Composition	Examples of fibres
Natural	Cellulosic	Cotton, Jute, Flax, Hemp, Banana fibre, Pina fibre, etc.
	Protein	Silk, Wool, Camel hair, Agora rabbit hair, Cashmere goat hair, etc.
	Mineral	Asbestos fibre
Manmade	Cellulosic	Viscose rayon, Modal, Tencel, etc
	Synthetic	Polyester, Nylon, Acrylic, Polyethylene, Polypropylene, etc.
	Protein	Soyabean fibre , Polylactic acid fibre, etc.
	Mineral	Glass fibre, Ceramic fibre, etc.
	Metallic	Aluminium fibre , Silver fibre, Tungsten fibre, etc.

2.2.2 Natural fibres

Natural fibres are obtained from the natural resources like plant/ vegetable, animal hair and natural minerals. Fibres from vegetable and plant origin are generally cellulosic in chemical composition. Animal fibres are protein in chemical composition. Natural cellulosic fibres are cotton, flax, jute, coir, hemp, banana fibre, etc. Natural protein fibres are wool, silk and other specialty fibres like camel hair, angora rabbit hair, pashmina goat hair, etc. Natural occurring mineral fibre is asbestos which is based on silicate of calcium and magnesium and is resistant to fire. Asbestos it is not widely used due to its toxic nature.

The following section describes the properties of the most commonly used natural fibres: Cotton, Jute, Flax, Silk and Wool.

COTTON

Cotton fibre is obtained from the seed hair of cotton. It is cellulosic in nature, therefore on burning emits the smell of burning paper. Under the microscope the fine structure of cotton can be observed. The cross section of the cotton fibre is kidney shaped. The length of the fibre ranges from 10 mm to 65 mm depending on the variety of cotton. In India the main cotton producing states are Maharashtra, Andhra Pradesh, Madhya Pradesh and West Bengal.



Cotton fibres are hygroscopic in nature which means that it can absorb around 8.5% of moisture of their dry weight. This gives the fibre the ability to absorb perspiration when made into textiles. Moreover, the hygroscopic nature prevents the cotton fabric to develop static electricity. This makes it suitable for wearing in hot and humid weather.

Cotton fibres have the ability to conduct heat energy and can withstand high ironing temperatures.

The strength of the cotton fibre is good and the strength increases when the fibre is wet. This makes the clothes made from cotton durable.

Cotton fibres are not affected by alkalis and mild bleaches. This enables the fibre to be laundered at home with detergents.

Cotton fibres can be affected by direct sunlight due to photochemical degradation in the presence of atmospheric oxygen and moisture. This causes the yellowness in undyed cotton/ white fabrics after a period of time.

Cotton fibres, yarns and fabrics can be easily dyed with different classes of dyes like direct, reactive, vat and sulphur dyes.



Figure 2.2 Raw cotton in cotton seed

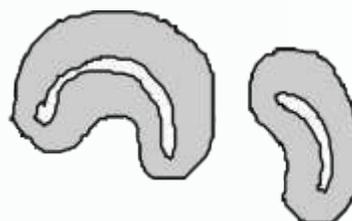


Figure 2.3 Cross-section of cotton fibres

JUTE

Jute fibre is obtained from the stem of the jute plant that grows in the belt of Ganges delta, mainly in the states of West Bengal, Assam and Bihar in India.

Jute fibre is cellulosic in nature and like cotton, can absorb moisture. The jute fibres have excellent strength and low elongation. The strength of jute fibres are higher than cotton and elongate less than cotton on application of weight. This property makes it suitable to be used in bags and sacks to carry heavy weight. But due to roughness and stiff handle of jute fibres is not used for clothing but used for carpets, bags, sacks and in industrial applications.





Figure 2.4 Jute plant



Figure 2.5 Jute yarn

FLAX

The flax fibre is thick, regular fibre with a subdued lustre. The colour of the fibre varies from light blonde to greyish blonde. The fibres can be bleached and dyed to any shade like cotton. The length of the fibre ranges from 10 cm to 100 cm. The cross-section of the fibres shows that flax fibres are polygonal in shape. The fabric made from flax is known as linen which is used for clothing.

Flax fibres are very strong and stiff in handle. Flax fibres (linen fabric) creases easily due to its stiff nature. This is one major difference from cotton fibre though both are cellulosic in nature.

Like cotton fibres flax can also absorb moisture and is resistant to alkalis.

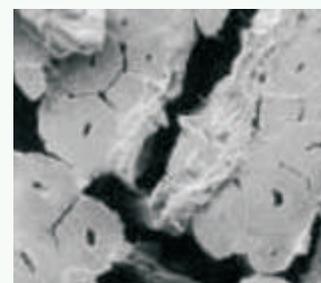


Figure 2.6 Cross-section of flax fibres under scanning electron microscope (SEM)

WOOL

Wool is the fibre obtained from the fleece of domesticated sheep. It is a natural protein fibre. The length of the wool fibres ranges from 5 cm for fine wool to 35 cm for the coarse and long wool. Merino wool is a type of fine Australian wool. The surface of the wool fibre has scales and the cross-section of the wool fibre is oval as shown in the fig 2.7.

The wool fibre is crimped which gives woollen fabric the natural bulkiness and warmth. The crimp in wool provides air space in the woollen fabrics. This warmth in wool is due to the air spaces which trap air and air being an insulator retains the body heat. Wool absorbs moisture more than cotton. Wool also gives off a small steady amount of heat while absorbing moisture. This also makes the wearer feel warm in the cold weather. This property of wool is unique and is not seen in other fibres.



Wool fibres have less strength than cotton, but elongate more than cotton. Wool is more resistant to acid than alkalis. Wool dissolves in alkali and therefore wool cannot be washed with detergents containing alkali. Dry cleaning is recommended for wool.

Exposure to sunlight and weather tends to turn wool yellow, similar to cotton due to photochemical degradation of the wool polymer.

Wool can be easily dyed with acid, reactive and metal-complex dyes.



Figure 2.7 Wool fibres under SEM



Figure 2.8 Natural crimp in wool fibres

SILK

Silk is a natural protein filament obtained from the cocoons of the silk worm. The silk is removed from the cocoon of the silk worm to give continuous length (700-1200 meters) of thread which is known as silk filament. The raw silk strand from the cocoons consists of two silk filaments, triangular in cross-section, held by a protein called sericin. Sericin is also known as the 'silk gum' which gives raw silk a coarse handle. This silk gum can be easily removed by a process called 'degumming' to give silk a smooth handle and bright lustre. It is for this reason that raw silk is coarse in handle and lacks lustre, but degummed silk is soft and lustrous.

Silk filament is very fine, regular in appearance. The triangular cross-section gives silk a smooth lustre as the filament reflects light uniformly.

Silk filament is stronger than wool. Silk is easily degraded by alkalis like wool and cannot be washed by normal detergents. Dry cleaning is recommended for silk fabrics. Sunlight affects silk like wool and cotton.

Silk is generally known as mulberry silk as the cultivated silk worm feeds on mulberry leaves. In India certain different varieties of silk other than mulberry silk which are known as "wild silk" like Tasar silk, Muga silk and Eri silk are available. These silk are cultivated from different type of silk



worms. The texture of the wild silk is different from mulberry silk. Tasar silk and Eri silk is coarser in texture and gives a silk fabric which looks different from mulberry silk. Mulberry silk is cultivated mainly in and around Bengaluru in the state of Karnataka, Tasar silk is cultivated in the Bhagalpur region in the state of Bihar and Muga silk in the state of Assam and West Bengal.



Figure 2.9 Silk Cocoons

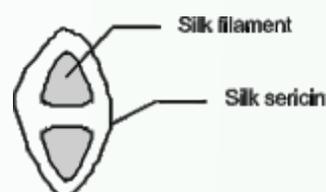


Figure 2.10 Cross-section of silk strand

2.2.3 Manmade fibres

Manmade fibres are not found in nature but are spun from polymers like cellulose, synthetic polymers, metallic compounds, etc by a mechanical spinning process. For cellulosic manmade fibres the cellulose is obtained from wood pulp and fibres like viscose rayon is spun. Textile fibres like polyester, nylon, acrylic polyurethane, polyethylene, polypropylene, etc are composed of synthesized polymers and are commonly known as synthetic fibres. The advantages of manmade fibres are that they can be modified during spinning to incorporate additional properties like antimicrobial activity, flame resistance property etc. In this section the popular manmade fibres like viscose rayon, polyester, nylon and acrylic will be discussed. A brief introduction to high performance manmade fibres is also presented in this section.

VISCOSE RAYON

Viscose rayon is a manmade regenerated cellulosic fibre. The fibres are spun from a viscous solution of alkali-cellulose. The name viscose is derived from the word viscous, which describes the liquid state of the spinning solution used for spinning of the fibre or filament.

Viscose rayon is fine, regular or staple fibre. The cross-section is serrated. The composition of viscose rayon is similar to cotton. Therefore, the properties of viscose rayon fibres are also similar to

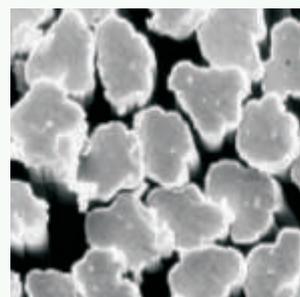


Figure 2.11 Cross-section of viscose rayon fibres under SEM



cotton. It is often blended with cotton or polyester and woven into fabrics. Viscose rayon absorbs moisture. Therefore, it can absorb perspiration and is suitable for hot and humid weather. It is resistant to alkalis and can be laundered at home with detergents.

POLYESTER

Polyester is manmade synthetic filament or staple fibre made from reaction between an alcohol and an acid. It is composed of *polyethylene terephthalate* units. The polyester filaments/ fibre are very strong. The strength remains unaltered when wet. This is because of the hydrophobic nature of the polymer. The hydrophobic nature of the polyester enables polyester fabric to dry quickly as the moisture absorption is 0.4% unlike cotton, wool, silk and viscose rayon.

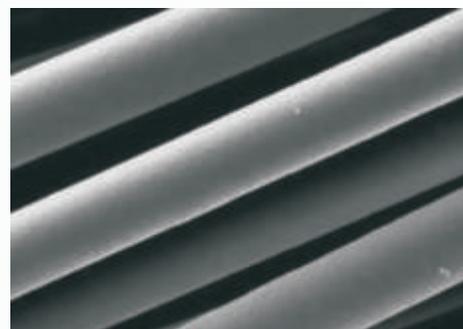


Figure 2.12 SEM image of polyester fibres

The high strength and stiffness of polyester makes it a wrinkle resistant fabric.

Polyester is thermoplastic in nature which means it is capable of being shaped or moulded when heated. It can be heat set. But at the same time on exposure to flame, the polymer catches fire and melts which can be hazardous. Therefore, flame-retardant polyester fibres have also been developed and commercialized.

Polyester is more resistant to acids than alkalis. Polyester is resistant to sunlight more than the natural fibres.

Polyester fibres are blended with cotton/viscose rayon fibres to develop a fabric which would possess the good qualities of both the fibres. Polyester cotton/viscose blended fabrics are stronger than 100 % cotton fabrics, dries faster than 100 % cotton fabrics, more crease resistant than 100% cotton. Polyester cotton/viscose blends are widely used as uniform fabrics and shirting/ suiting material.

NYLON

Nylon is a polyamide manmade filament or fibre. The nylon filament/ fibres are known for its good strength and excellent abrasion resistance. Nylon filaments/ fibres also have elasticity more than polyester. Nylon absorbs around 4% moisture on its dry weight. These properties makes suitable for products like ropes, socks, swim wear, cycling shorts and certain sportswear where high strength, elasticity and abrasion resistance is required.





Nylon like polyester is thermoplastic in nature and melts when heated.

Nylon is less resistant to acids than to alkalis. It has fair resistance to sunlight and weather.

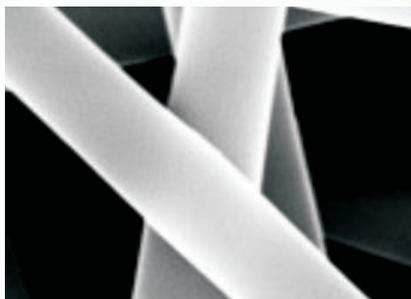


Figure 2.13 SEM image of nylon fibres

ACRYLIC

Acrylic filaments/ fibres are spun from acrylonitrile polymer. In *modacrylic* fibres a copolymer is also used along with acrylonitrile. *Acrylonitrile* fibres are slightly wavy and this gives acrylic fibres a bulk like wool. Acrylic fibres are used for knitted sweaters, winter wears, shawls, curtains, imitation fur, pile fabric, upholstery fabrics, etc.

Acrylic fibres have good strength and a soft handle. Acrylic fibres are hydrophobic in nature which results in development of static

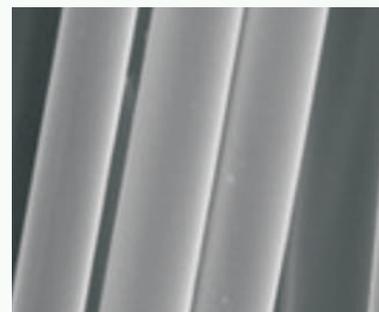


Figure 2.14 SEM image of acrylic fibres

elasticity. When exposed to flame acrylic fibres ignite immediately. Acrylic fibres are more resistant to acids than alkalis. Acrylic fibres are also resistant to sunlight and weather.

2.2.4 High Performance Fibres

Apart from the conventional fibres that have been discussed in this chapter, a number of high performance fibres have been developed and commercialized. These fibres have high strength, resistant to chemicals and can withstand high temperature without degradation. They are used for bullet proof vests, fire fighters' uniform and in aerospace engineering including aircrafts and in industrial applications. Some examples are carbon fibres, ultra high molecular weight polyethylene fibres (DyneemaTM and SpectraTM), aramid fibres (KevlarTM, NomexTM, TwaronTM), etc.



EXERCISE 2.1

PURPOSE: To enable students to understand the source and origin of fibres

1. Classify the following fibres as natural or manmade fibres:

Hemp, Polyester, Acrylic, Mohair, Polypropylene, Glass, Jute, Merino Wool, Pinafibre, Cashmere, Cotton, Angora, Banana, Camel hair, Ceramic, Kevlar.

2. Match the following:

PART A	PART B
Kevlar	Manmade cellulosic fibres
Hemp, Jute, Flax	Natural mineral fibre
Viscose rayon, Modal, Tencel	Natural cellulosic fibres
Wool, Angora, Cashmere	Animal protein fibres
Asbestos	High Performance Fibres

ACTIVITY 2.1

Collect 5 different type of fibres and write down their properties and applications. Include new areas of application of the fibres in the field of technical textiles also.

2.3 YARNS

The fibres / filaments are converted to a yarn for weaving or knitting. Individual fibres are made parallel to one another using a series of machines in a spinning unit. Then the parallel strands of fibres are drafted and twisted together to form a yarn. The twist imparts strength and cohesion to the yarn. When yarn is spun from staple fibres it is known "spun" yarn and when yarn is made from twisting of parallel filaments like silk, where the filament runs throughout the strand of the yarn it is known as "filament yarn". The process of yarn formation is shown in the figure below:

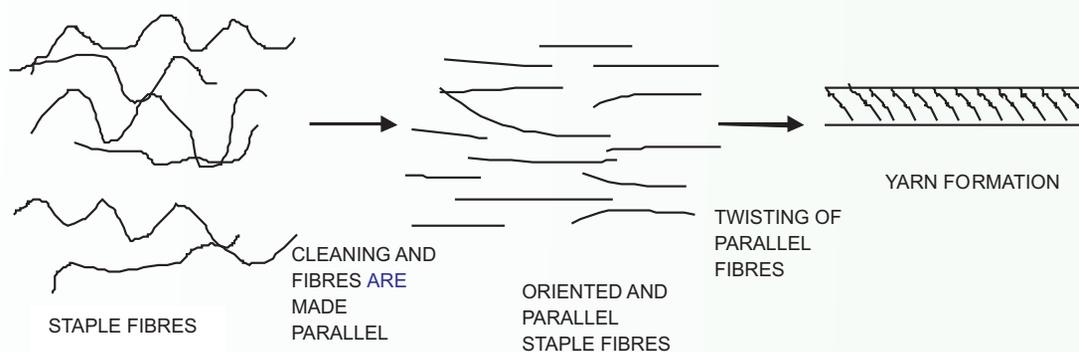


Figure 2.15 Yarn formation

EXERCISE 2.2

PURPOSE: To understand the process of yarns formation

1. Write TRUE/FALSE against each of the following statement

- Twist imparts strength and cohesion to the yarn.
- Yarns made from staple fibres are known as filament yarns.
- Silk is an example of filament yarn.
- Cotton fibres need to be cleaned, made parallel, drafted and twisted for yarn formation.
- Yarns are not used for weaving and knitting.

ACTIVITY 2.2

Open any yarn by untwisting it and remove the fibres or the filaments to observe the process of yarn formation.

2.4 WEAVING

Weaving is the process of interlacement of two sets of yarn which are perpendicular to one another. Weaving is done using looms. Looms can be classified as handloom or powerloom. Powerloom can be non-automatic or automatic. Handlooms are operated manually and power looms require electricity. Some traditional Indian fabrics are produced by handlooms in certain clusters in India. The basic components and the fundamental process of weaving is same in all the looms.

In order to interlace warp and weft threads on any type of weaving machine, the three basic



operations of shedding, picking and beat up are necessary. The set of thread that run down the fabric in the longitudinal direction is termed as "warp" and the set of threads that is inserted in the fabric in the horizontal direction is termed as the "weft", as shown in the figure 2.16.

The three basic operations during weaving are as follows:

1. **Shedding:** Separating the warp threads into two layers to form a tunnel known as shed.
2. **Picking:** Passing of the weft thread through the shed. The weft threads are the yarn which traverses down the width of the fabric, perpendicular to the warp as shown in the figure.
3. **Beating:** This is pushing the newly inserted length of weft, known as pick to the already woven fabric at a point known as the fell.

The above three operation are known as the primary motions of weaving and occur in a sequence for fabric production.

2.4.1 Weaving process

Yarn from the warp beam passes over the back rest and comes through the drop wires to the healds, which are responsible for separating the warp for the purpose of shed formation. It then passes through the reed, which holds the threads at uniform spacing and is also responsible for beating up action of the weft threads to the fell of the cloth. The pick is inserted in between the reed and cloth roller through a pick insertion mechanism or shuttle. The fabric then gets wound up in the cloth roller with the help of take up roller.

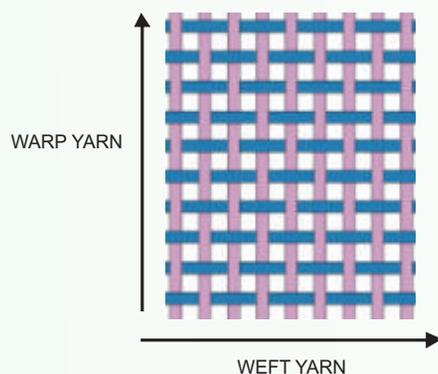


Figure 2.16 Warp and weft yarn in a fabric

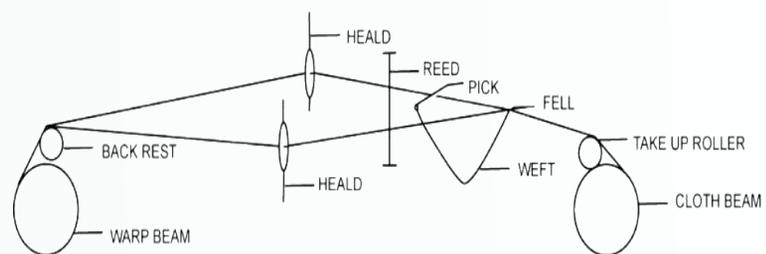


Figure 2.17 Cross-section through the loom showing weaving process



2.4.2 Weave structures

The number of weave structures that can be produced is practically unlimited. In this section the basic structures like plain, twill and sateen weave from which other woven structures are developed are discussed.

PLAIN WEAVE

Plain weave is the simplest interlacing pattern that can be produced. It is produced by alternatively lifting and lowering one warp thread across one weft thread. Figure 2.19 shows the representation of a plain woven fabric. The yarns do not lie straight with the fabric because the warp and weft have to bend round each other when they are interlaced.

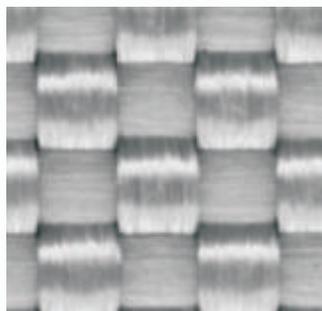


Figure 2.18 Microscopic image of plain woven fabric

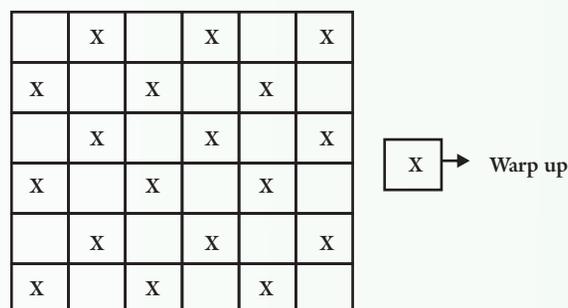


Figure 2.19 Graphical representation of plain weave

TWILL WEAVE

A twill is a weave that repeats on three or more ends and picks and produces diagonal lines on the face of a fabric. The direction of the diagonal lines on the surface of the cloth is generally viewed along the warp direction. Denim and jeans fabrics are common examples of twill weave.



Figure 2.20 Twill woven fabric

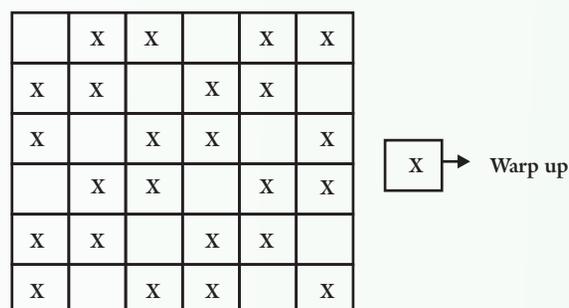


Figure 2.21 Graphical representation of 2 up 1 down twill weave



SATIN AND SATEEN WEAVE

In Britain a satin is a warp faced weave in which the binding points are arranged to produce a smooth fabric surface free from twill lines. A satin is frequently described as a 'warp satin'. A sateen, frequently referred to as 'weft sateen' is a weft faced weave to give a smooth and shiny appearance.

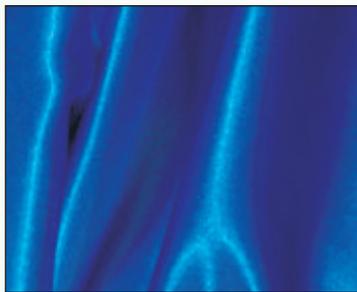


Figure 2.22 Satin woven fabric

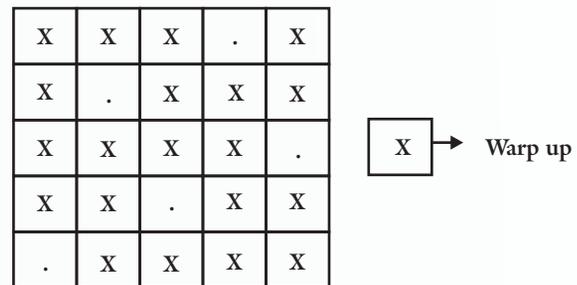


Figure 2.23 Five- end sateen weave

EXERCISE 2.3

PURPOSE: To understand the process of weaving

1. Write TRUE/FALSE against each statement

- Shedding is the process of separating the warp threads into two layers to form a tunnel known as shed.
- Picking is the process of insertion of the warp thread in the shed.
- Shedding, Picking and Beat up are the secondary motions in a loom.
- Plain, Twill and Satin weaves are basic weaves.
- Plain weave is the simplest form of interlacement that can be produced.

ACTIVITY 2.3

Take any fabric swatch and analyze the movement of the warp and the weft in the fabric sample and illustrate it in a paper.



2.5 DYEING

Dyeing is the process of coloration of textile materials by immersing them in an aqueous solution of dye. Dye molecules are organic molecules. Dye molecules are coloured because they are selectively able to absorb and reflect incident light. The dye molecules are able to react with the functional groups in the fibre in the amorphous regions and form ionic bonds/ van der Waal's forces or covalent bonds and impart colour to the textile fibre. The dye molecules must remain in the fibre after repeated washes in a textile which is colour fast.

2.5.1 Classification of dyes

Dyes can be broadly classified as synthetic dyes and natural dyes based on the source.

2.5.2 Natural dyes

Natural dyes are a class of colorants extracted from vegetative matter (seeds, leaves, roots, and bark) and animal residues. Natural dyes on textiles have been used since ancient times. The earliest written record of the use of natural dyes was found in China dated 2600 BC.

Advantages of Natural Dyes

1. Natural dyestuff can produce a wide range of colours
2. A small variation in the dyeing technique or the use of different mordants (e.g copper sulphate, ferrous sulphate, alum, etc) with the same dye can shift the colours to a wide range or create totally new colours, which are not easily possible with synthetic dyestuffs.
3. Unlike non-renewable basic raw materials for synthetic dyes, the natural dyes are usually renewable, being agro-renewable/vegetable based and at the same time biodegradable.
4. In some cases like harda, indigo etc., the waste in the process becomes an ideal fertilizer for use in agricultural fields. Therefore, no disposal problem of this natural waste.
5. Many plants thrive on wastelands. Thus, wasteland utilization can be an added advantage if natural dyes are extracted from plants in waste lands.

Limitations of Natural Dyes

1. It is difficult to reproduce shades by using natural dyes/colourants, as these are agro products.
2. Colorant varies from one crop season to another crop season, place to place and species to species, maturity period etc.



3. Natural dyeing requires skilled workmanship and is therefore expensive. Low colour yield of source natural dyes thus necessitates the use of more dyestuffs, larger dyeing time and excess cost for mordants and mordanting.
4. Scientific backup is necessary and research and development in this field is still required.
5. Lack of availability of precise technical knowledge on extraction and dyeing techniques.
6. The dyes are sensitive to pH. They change colour if the pH of the water changes.
7. The dyed textile may change colour when exposed to the sun, sweat and air.
8. Nearly all-natural dyes with a few exceptions require the use of mordants to fix them on to the textile substrate. While dyeing, a substantial portion of the mordant remains in the residual dye bath and may pose serious effluent disposal problem.

2.5.3 Synthetic dyes

Synthetic dyes are chemically synthesized organic compounds. They have been classified based on the application. The different classes of dyes have affinity for different fibres. The different classes of synthetic dyes with the fibres that they can dye are given in table 2.2.

Table 2.2 Classes of synthetic dyes

Class of dye	Fibres which can be dyed
Direct dyes	Man-made & natural cellulosic fibres (cotton, flax, viscose rayon)
Acid dyes (anionic dyes)	Natural protein fibres (silk, wool), nylon fibres
Basic dyes (cationic dyes)	Acrylic , modacrylic fibres
Disperse dyes	Polyester, nylon, acrylic, cellulose acetate
Reactive dyes	Cellulosics & protein fibres (Cotton & Silk)
Mordant dyes	Wool, silk (natural protein fibres)
Metal-complex dyes	Wool, silk (natural protein fibres)
Sulphur dyes	Natural & man-made cellulosic fibres
Vat dyes	Cellulosic fibre





Advantages of Synthetic Dyes

- ★ A small quantity of colorant is required to dye large quantity of textile material
- ★ A whole gamut of shade can be achieved with synthetic dyes
- ★ The shades can be easily reproduced so that similar shade is achieved on repeated dyeing
- ★ The dyes like reactive, vat, disperse have excellent fastness properties

Limitations of Synthetic Dyes

- ★ Synthetic dyes also require electrolyte (salt) and auxiliaries for dyeing
- ★ The waste water from the dye house needs to be treated for proper effluent control to reduce water and soil pollution.

2.5.4 General theory of dyeing

Dyeing is the process of coloration of textiles by immersing in an aqueous solution of dye known as dye bath. The dye molecules must diffuse from the dye bath to the fibre. The dye molecules must penetrate inside the fibre structure in the amorphous regions to give the required fastness. To improve the effectiveness of dyeing, electrolyte (e.g salt, soda ash), dye auxiliaries (e.g. levelling agents) and heat is required to assist the process of dye diffusion.

Dyeing can be done in fibre stage, yarn stage, fabric stage or even garment dyeing can be done. In the textile industry dyeing machines are used for dyeing. Modern dyeing machines are sophisticated and computerized for standard dyeing process. In the handloom sector of India manual dyeing is still practised.

EXERCISE 2.4

PURPOSE: To understand the basic theory of dyeing and different classes of dyes

1. Fill in the blanks:

- a. is the process of coloration of textile materials by immersing them in an aqueous solution of dye.
- b. The dyes that are extracted from vegetative matter (seeds, leaves, roots, and bark) and animal residues are termed as



- c. Synthetic dyes are organic compounds.
- d. class of dye can dye natural and manmade cellulosic fibres.
- e. and dyes can dye protein fibres like wool and silk.

2. Write TRUE/FALSE against each statement

- a. Dyes are soluble in water.
- b. Dyes form bonds within the fibre structure.
- c. Dyeing can be done on fibres, yarns and fabrics.
- d. A large quantity of colorant is used, to dye fabrics with synthetic dyes.
- e. Natural dyes are sensitive of pH.

ACTIVITY 2.4

Take 5 samples of fabric 5*5 cm² and wash them in a solution of detergent for 15-20 minutes. Dry them and check visually if there is any loss of colour during washing. Try to find out why the colour fastness to washing is good or poor.

2.6 PRINTING

Printing is the process of application of colorant to a specific area of the fabric based on the design of the print. It is like localized dyeing of textiles. The process of printing on textiles using wooden blocks was common in India since 12th century. India holds a rich tradition of block printing. Presently, block printing, screen printing, transfer printing and digital printing are done on textiles.

2.6.1 General theory of printing

The printing of textile materials is the process of application of colorant to a predetermined area of the design. For printing dye or pigment is required as the colorant. The printing on textiles is done with the application of print paste that is prepared by using dye/pigment, binder, thickener, water and other print auxiliaries. A print paste limits the colorant to a limited part of the fabric, unlike dyeing where the colorant should be applied uniformly throughout the fabric. This section would discuss the role of the different ingredients used in printing of textiles.

Dye/pigment: The main colouring compound in the printing process.





Water: A small amount of water is required in printing to dissolve the dye into the print paste. Water is a convenient and easily available medium to mix and disperse the dye molecules in the thickener.

Thickener: The purpose of the thickener is to produce a medium for the dye paste. The viscosity of the printing paste is very important as it affects the clarity and depth of the printed pattern. The physical and chemical properties of the thickener should be such that it should not crack immediately after printing. Thickeners can be any of the following:

- ★ Natural gums such as gum Acacia, gum Arabic or gums from starches
- ★ Manmade natural polymer based gums like carboxyl methyl cellulose, sodium alginate, or
- ★ Manmade synthetic compounds such as polyvinyl alcohol.

Steam: After printing the next process is generally steaming. Steaming ensures adequate penetration of the dye molecules in the fibre. This is possible because steaming provides energy for the dye molecules to enter the fibre structure. Steaming also helps in swelling of the fibre so that the dye from the print paste can enter the fibre polymer system.

Dry heating: Thermoplastic fibres tend to be hydrophobic and do not swell sufficiently in water when subjected to steaming. Dry heating softens the fibre and allow the dye molecules to enter into the amorphous region of the fibre structure.

Washing off: Washing is done to remove the thickener and other printing paste from the surface of the fabric after the printing process.

2.6.2 Methods of printing

Printing can be done using different methods. The different methods of printing are presented in this section.

- i. Block Printing : Manual method
- ii. Screen printing
 - ★ Flat bed screen printing (manual/semi-manual/ automatic)
 - ★ Rotary screen printing (automatic)
- iii. Transfer printing/ sublimation printing
- iv. Digital printing
- v. Other methods: Flock printing, foil printing, embossing, rubber print, etc.



BLOCK PRINTING

Block printing is one of the traditional styles of printing in which wooden blocks are carved according to the design. Then the blocks are placed on the print paste and stamped on the fabric to be printed. To reduce the size of the print, the size of the block need to be changed. It is a manual method of printing which is still practiced in India mainly in the following states:

Table 2.3 Block printing locations in India

States	Locations
Andhra Pradesh	Hyderabad, Machalipattnam (Kalamkari)
Gujarat	Ahmedabad (Pethapur), Kutch, Porbandar, Rajkot
Rajasthan	Bagru, Chittroli, Sanganer, Jaipur, Jodhpur
Madhya Pradesh	Bagh, Behrongarh, Indore, Mandasar, Burhanpur
Uttar Pradesh	Benares (Block-makers), Farrukabad, Pilakhuan (Blockmakers)
West Bengal	Kolkata and Serampore



Figure 2.24 A wooden block for block printing



Figure 2.25 Block printing process

SCREEN PRINTING

In screen printing a screen is first prepared using a porous mesh. The area through which the print paste has to pass is kept open in the screen and the remaining areas are blocked in the screen as per the





print design. Depending on the number of colours that are required for printing, the same number of screens needs to be prepared. The print paste is then applied on the fabric by using a squeegee. Print paste is applied on the screen and the squeegee then moves across the screen, forcing the print paste through the screen and into the fabric. Rotary screen printing is the most popular method of printing and the most economical printing method in the textile printing industry. It has also a high production rate.

TRANSFER PRINTING

Transfer printing is the process of transferring an image to fabric by the process of sublimation transfer, melt transfer or film-release method. In this method the image is generally printed on a paper carrier using volatile dyes. When heat and pressure are applied to this paper the dyes are transferred to the fabric. Volatile disperse dyes are used for transfer printing.

DIGITAL PRINTING

Digital printing is the latest advancement in the method of printing, in which digital inkjet printing machines are used to print the design on the fabric. As the process is computerized, screen or block preparation is not necessary to transfer the design on the fabric. The inks used for digital printing can be based on dyes or pigments. It gives more flexibility to change the design than block or screen printing.

The fabrics are generally pretreated, and placed in the machine for printing, the dyes are fixed usually by steaming in a separate machine, washed off and dried.

EXERCISE 2.5

PURPOSE: To understand the basic process of printing of textiles

1. Fill in the blanks:

- a. is like localized dyeing of textiles.
- b. is a traditional method of printing.
- c. For printing or is required as the colorant.
- d. Acacia gum, Gum Arabic or gums from starches are used as in printing.
- e. The number of screens required for screen printing of a particular design is equivalent to the number of in the design.



2. Differentiate between transfer printing and digital printing.

Review Questions

1. How can textile fibres be classified?
2. Give 4 examples of cellulosic natural fibres.
3. What are the sources of natural protein fibres?
4. What is the difference in the properties of cotton and jute fibres?
5. What are the differences between the properties of cotton & wool?
6. What are the advantages of polyester over cotton fibres?
7. What are the applications of nylon and acrylic fibres?
8. What are the applications of polyester and viscose?
9. Name 3 high performance fibres.
10. Why is wool warm to wear?
11. What is the reason for the lustre of silk?
12. Name 3 traditional Indian textiles.
13. What are the steps involved in weaving?
14. Name three basic weaves.
15. What is warp and weft in a woven fabric?
16. Graphically represent plain weave.
17. What are the different types of looms?
18. What are the parts of a loom?
19. What are the uses of twill weave?
20. What is the difference between natural and synthetic dyes?
21. What are the advantages of natural dyes?
22. What are the disadvantages of synthetic dyes?
23. Which class of dye can be used for cotton?
24. Briefly explain the process of dyeing.





25. What are the different methods of printing?
26. What is the difference between transfer printing and digital printing?
27. In which regions of India is block printing still practised?
28. What is the function of thickener in printing?
29. Which method of printing is most popular and why?
30. What are the advantages of digital printing?
31. Sketch the cross-section of cotton fibre.
32. Why is rayon called regenerated cellulosic fibre?

ACTIVITY 2.5

Take 5 printed fabric samples 10cm * 10cm. Study the print design. Sketch the print design on paper and write down how many dyes/pigments have been used to print the design.



GLOSSARY

- Acid Dye:** An anionic dye characterized by its affinity for Protein and Polyamide Fibres usually applied from an acidic dye bath.
- Acrylic Fibre:** A term used to describe fibres composed of synthetic linear molecules having in the chain at least 85% (by mass) of acrylonitrile groups.
- Angora:** The hair of the Angora rabbit. Note: The Hair of the Angora Goat is referred to as Mohair.
- Aramid Fibre:** A term used to describe fibres composed of synthetic linear macromolecules having in the polymeric chain recurring amide groups. These fibres are high performance fibres.
- Basic Dye:** A cationic dye characterized by its substantivity for basic-dyeable acrylic and basic-dyeable polyester fibres.
- Block Printing:** A hand printing method using wood, metal, or linoleum blocks. The design is carved on the blocks, one block for each color. The dye is applied to the block which is pressed against the fabric.
- Cashmere:** Originally hair from the downy undercoat of the Asiatic Goat. Currently similar hair from animals bred selectively from the feral goat population of Australia, New Zealand and Scotland, is also being regarded as Cashmere provided the fibre diameter is similar.
- Cocoon:** An egg-shaped casing of silk spun by the silkworm to protect itself.
- Continuous-filament Yarn; Filament Yarn:** A yarn composed of one or more filaments that run essentially the whole length of the yarn. Yarns of one or more filaments are usually referred to as monofilament or multifilament, respectively.
- Cotton:** The seed hair of a wide variety of plants of the gossypium family.
- Drawing (Synthetic Filaments and Films):** Drawing is the process of stretching synthetic filaments to orient the molecular chains in the filament in a particular direction.
- Dupion:** A type of coarse and rough silk yarn that is spun from double cocoons. The silk yarn of dupion silk is bulky and coarse as compared to mulberry silk.
- Dye:** A colorant that has substantivity for a substrate and is soluble in water.
- Glass (fibre):** A term used to describe fibres made of mixed silicates.





- Gum-Sericin:** The silk gum that holds the two strands of silk filament together is called sericin. It is protein in nature and soluble in water.
- Hydrophilic:** Having an affinity for water.
- Hydrophobic:** Having no affinity for water.
- Man-made Fibre:** A Fibre manufactured by man and distinct from a fibre that occurs naturally.
- Merino:** Refers to the wool from the merino sheep that is fine, strong and of a very high quality.
- Mordant:** A substance, usually a metallic compound, applied to a substrate to form a complex with a dye, which is retained by the substrate more firmly than the dye itself.
- Permanent Set:** The process of conferring permanent stability, pleats, creases in fibres or fabrics by successive heating and cooling.
- Pigment:** Pigment is a substance that adds colour to the medium when it is dispersed in the medium. It is insoluble in water.
- Polyamide, Natural (fibre):** Natural fibres consisting of polymers containing the repeating group -CO-NH-. Examples are silk, wool and other animal hairs.
- Polymer:** A large molecule built up by the repetition of small, simple, chemical units.
- Rotary Screen Printing:** In Screen printing a separate screen is created for each color. Rotary cylinders are used for printing. The number of cylinders in Rotary printing is equivalent to the number of colours. It is a faster process than any other method of printing and also economical. The size of the design repeat is limited to the circumference of the cylinders.
- Sateen:** Sateen is a type of weave that gives a glossy appearance to the fabric. It is generally
- Weft:** The yarn that run across the width of the fabric.
- Yarn:** A Product of substantial length and relatively small cross-section consisting of fibres and/or filament(s) used for weaving, knitting, etc.



Design Fundamentals

3.1 DESIGN, DESIGNER AND DESIGN PROCESS

Everything we see, touch and use is either man made or natural. The shape of the sun, the clouds, the hills, the trees, flowers, everything living are natural. The non-living things are man-made like the clock, mobile phones, the bed we use for sleeping comfortably, the chair and table, the quilt we use to keep warm in winters, the clothes we wear, the robot, the computer, a simple thing like a safety pin, a tooth brush, a spoon. They have all been designed and created by human beings, specially trained and educated in the field of design just like doctors and engineers. There are many kinds of designers and each is trained in their special area. These specialized design professionals include Fashion designers, Product designers, Textile designers, Graphic and communication designers, Landscape designers Interior designers and many more.

A designer not only improves the outside beauty and aesthetics of the object but most importantly improves the use and functioning of the object. This brings out a clear difference between two very close but different professionals, a designer and an artist. An artist's work has aesthetic appeal, has beauty, interpreted and expressed in his own way through colors and shapes in the form of paintings. A designer's work too has aesthetic appeal but is in response to a market need, a client need. A designer fulfills a need, a purpose. He/she creates for others, a client, a market, a country. Tom Ford, a fashion designer has aptly said, "As a fashion designer, I was sure that I was not an artist because I was creating something that was made to be sold, marketed, used and ultimately discarded".

A product is well designed when aesthetics, beauty and functionality along with salability are all in a perfect balance. A good example of a product designed with a balance of aesthetics and function is a helmet depicted in Figure 3.1.1. Presently available in the market, it is a well designed product because as compared to the helmets existing earlier, it is now much lighter and comfortable to wear; it looks smart and attractive, available in many colors. People feel happy to use them unlike the earlier helmets which looked like they were straight from a 14th century battle field. The helmets of today look good, are comfortable, lightweight, safe and affordable. They serve the function of protecting the user's head, eyes and ears from the cold, hot sun, wind, flying insects and most of all from head injuries in case of road accidents.

Design and Creativity

Creativity and Originality does matter, it is important but not at the expense of good design.





'Creative' does not mean 'different' or 'bold'. Design is about a fresh look, a unique, and an unusual interpretation. Good design respects our need for the familiar while still being unique.

3.1.1 The Design Process

Good design does not "assemble" or "decorate" arbitrarily. Designing is a conscious, logical yet creative activity. There is a method, a plan, a reason, and a process involved while creating good designs.

A designer has to first of all use his knowledge of the basic tools of design. The designer's tools are the elements and principles of design. He/she uses these tools like a carpenter uses his tools. The Elements of design are Dots, Lines, Shapes, Texture, Color and the Principles of design are Rhythm, Balance, Proportion, and Emphasis. A good design does not just happen, nor is it suddenly discovered. It is a process involving a thorough research on the existing similar products, the existing problems, the need for improvement, the future use, what are the new features, changes that people are looking for. The designer then looks for sources of inspiration, studies, trends, and forecasts and begins to make sketches. The most appropriate sketch is chosen, details are clearly designed and all directions for making the product are written. A prototype or sample is made of the new design and it is shown to a client and tested in the market for viability, usability, and originality. Once it does well, the product is then produced in large quantities or in bulk. Charles Eames has very correctly defined design as "A plan for arranging elements in such a way as to best accomplish a particular purpose".



Figure 3.1 Helmet

Now that we know what is design and what is the role of a designer and how he or she follows a design process we learn to be more sensitive to our environment. We realize that everything we use cannot be taken for granted and learn to value the work of God and designers.

EXERCISE 3.1

True or False

1. Designing is a conscious, logical yet creative activity.
2. A designer only improves the outside beauty and aesthetics of an object.
3. The designer's tools are the elements and principles of design.



4. An artist improves the use and functioning of an object.
5. For creating good designs a method, a plan, a reason, and a process are involved.

Review Questions

1. Give an example of any product, explaining its aesthetics and functionality from a user's point of view.
2. Write a short note on design process.

ACTIVITY 3.1

This activity is intended to enable students to trace the Pendulum Swing in fashion history through photographs/visuals.

1. Select a specific product design from magazines or web resources.
2. Analyze the design and find out its association with any natural form, for example a carpet design is inspired from grass in the lawn.

3.2 ELEMENTS OF DESIGN

In our day-to-day life we experience design intent in everything around us. Presence of specific factors which makes the visual experience pleasing or non-pleasing are identified as Elements and Principles of design.

The Elements of Design are the fundamental components of any design composition. They are required to be arranged as components for creating design compositions.

3.2.1 Point

Point is the simplest element of design. Which it is put into a blank space it turns an inactive space into a visually active space.

Interesting examples of how points are used in design of lifestyle products and footwear are shown in Figure 3.2.1 and 3.2.2





Figure 3.2.1 Points used in Product



Figure 3.2.2 Points used in Footwear

A point depicts a precise and limited location. For an example circular shape of dot is adopted as an inspiration for designing electric bulbs. It is also used in Indian culture in the form of traditional auspicious symbol known as *bindi* or *bindu*. It creates a contrast with the background, which implies a strong identity and approach.

The points used in a regular repetition form a pattern or design which is extensively used in apparel and lifestyle accessories as depicted in Figure 3.2.3 and 3.2.4



Figure 3.2.3 Points used in Accessory



Figure 3.2.4 Point used in Apparel

3.2.2 Line

Line is another element of design characterized as a mark with length and direction, created by joining points across a surface. Multiple lines also create contours and shapes. Lines can be seen in almost everything around us including leaves, roots, branches, water waves, fish, birds, animals and manmade objects. An example of lines in vegetation is shown in Figure 3.2.5.



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Lines differ with each other in length, width, direction, curvature, and weight. Lines can be categorized in three kinds including organic, rigid and differing weights. A curved line possesses dynamic, ever changing, and natural characters, while a straight line is more static in nature. Diagonal lines are often used to create a movement and depth in a composition. Horizontal lines impart passive, stagnant and tranquil appeal to a composition while vertical lines evoke strength and control. Usage of lines in a bed cover is depicted in Figure 3.2.6.



Figure 3.2.5 Lines in Nature



Figure 3.2.6 Lines used in Home-Textiles

Line depending on its use may recall, inform, describe and signify subjective forces and arouse deep associations. Lines may signify things, actions, concepts, qualities and conditions. Examples of lines used in footwear and lifestyle products are portrayed in Figure 3.2.7 and 3.2.8.



Figure 3.2.7 Lines used in Footwear



Fig. 3.2.8 Lines used in Product





3.2.3 SHAPE

When a line crosses itself or intersects with other lines forming an enclosed space, a shape is formed. Thus shape is an element of design, which is defined by its closed contours. Shape is an area or form with a definite outline and a visible appearance and structure.

In a composition the filled or solid portion is called positive space while space around the positive space is called negative space. Both positive space & negative space are essential to see shapes.

Shapes can be divided in three categories based on their structures:

- ★ Organic shapes
- ★ Geometric shapes
- ★ Abstract shapes

Free flowing, informal and irregular shapes are termed as organic shapes. Some examples of organic shapes in nature are flowers, seashells and tree branches. Organic shapes from nature are extensively used in lifestyle products as depicted in Figure 3.2.9 and 3.2.10.

Figure 3.2.11 depicts their usage in fashion accessory i.e. scarf



Figure 3.2.9 Organic Shapes used in decorative Product



Figure 3.2.10 Organic Shapes used in Product

On the other hand geometric shapes are rigid, regular and precise in nature. Some examples of geometric shapes are beehive, spider web and water drops. An example of geometric shapes used in repetition, is shown in Figure 3.2.12.



Fashion Studies

03

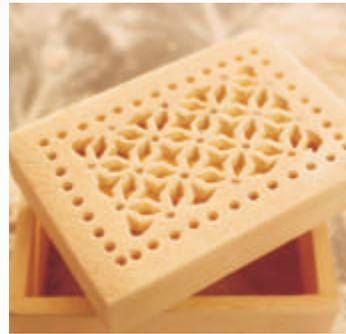


Figure 3.2.11 Organic Shapes used in Accessory Figure 3.2.12 Geometric Shapes used in products

Figure 3.2.13 depicts usage of geometric shapes (checks) in woven textiles while Figure 3.2.14 depicts their presence in surface of a hand-knitted cap.

Whenever an original shape is modified to change its character, the new changed shape is called an abstract shape. Few examples of abstract shapes used in carpets, architectural forms and paper designs are portrayed in Figure 3.2.16, 3.2.17 and 3.2.18



Figure 3.2.13 Geometric Shapes used in Textiles



Figure 3.2.14 Geometric Shapes used in Knitted Accessory

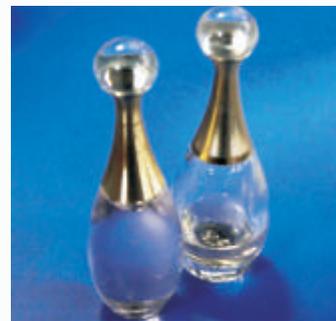


Figure 3.2.15 Organic Shapes used in Product



Figure 3.2.16 Abstract Shapes used in Carpet



Figure 3.2.17 Abstract Shapes used in Architecture

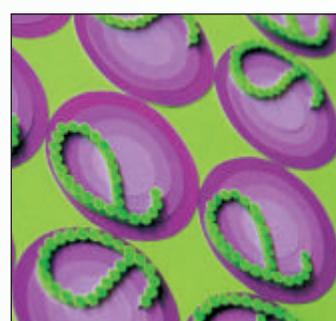


Figure 3.2.18 Abstract Shapes used in Paper Design





3.2.4 Texture

Texture relates to the physical make-up of a given form. It refers to surfaces that have more than two dimensions thereby enhancing the surface quality. For example, there is a smooth surface of silk and rough surface of jute. Figure 3.2.19 and 3.2.20 shows presence of textures in nature. It adds visual as well as tactile interest to the surface appearance. Tactile interest refers to the actual feel of surface while visual interest relates to the perceived look. Textures are described by adjectives such as rough, smooth, voluminous, flat, pebbly, soft, uneven etc. Various examples of textures found in nature are shells, row of trees in the woods, tree bark, texture on the wings of birds and insects, clouds, snow, flower petals and many more.

The categories of Textures are mentioned below:

- ★ **Real Texture:** A real texture is the actual texture of a form. Usually artists create real textures in art forms to impart visual interest. A piece of pottery can have a rough texture to depict its natural character or be given a smooth texture by glazing technique.
- ★ **Implied Texture:** It is not the real texture (three dimensional texture) it is a visual impression of a texture. For example a sketch of a tree bark may look real but actually the rough texture of the bark has been created by shading on a that piece of paper.

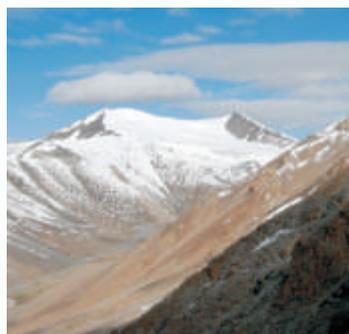


Figure 3.2.19 Texture in Nature



Figure 3.2.20 Texture in Nature

Figure 3.2.21 and 3.2.22 depicts usage of implied textures in paper designs and lifestyle products.

As a fashion designer, understanding of texture as an element of design ultimately lead to fabric manipulation techniques like gathering, pleating, tucks etc. There are varieties of textures visible in nature and the same can be used as source of inspiration for creation of different surface designs of garments and products. For example texture of grass can simply be an inspiration surface for the



texture of a carpet. The texture of the carpet adds a visual attribute, as if someone is walking on soft grass field.



Figure 3.2.21 Texture in Paper Design Figure 3.2.22 Texture used in Product

EXERCISE 3.2

Fill in the blanks

1. When a line crosses itself or intersects with other lines, it forms a _____.
2. In a composition filled or solid portion is called _____ space while the space around the filled portion is called _____ space.
3. An element of design characterized as a mark with length and direction is termed as _____.
4. When the points are used in a regular repetition they form a _____.

Match the following:

Geometric shapes	Add tactile interest to the surface appearance
Organic Shapes	Categorized as organic, rigid and differing weights
Textures	Rigid, regular and precise in nature
Lines	Free flowing, informal and irregular

Review Questions

1. What are major elements of design?
2. What is the fundamental difference between elements and principles of design?





3. Explain the symbolic meaning of point in context with Indian culture.
4. Quote four different examples of lines present in nature and four different examples in man-made environment?
5. Differentiate between real and implied textures with suitable examples?
6. Explain organic, geometric and abstract shapes giving an example of each type.
7. Create a composition using 2 geometric and 2 organic shapes

ACTIVITY 3.2

This activity is proposed to inculcate observational and analytical approach in viewing day-to-day forms in finer perspective.

1. Visit a nearby crowded street and select an area of your choice like vehicle, shop, street vendor, old building etc.
2. Observe and analyze the selected area and identify the principles of design (point, line, shape and texture) present in it.

3.3 COLOUR THEORY AND PSYCHOLOGY OF COLOURS

Colour is the most important element of design, as what ever we see will not evoke any emotions in the absence of colour. It is a very effective and powerful tool for visual communication of concepts. Shape on form and color are the two basic components in visual communication. Form affects the intellect while the color evokes emotions.

Visibility of any colour is a basic property of light. When light strikes a surface certain wavelengths are absorbed and others are reflected (bounce back) by its pigment or colouring matter. By means of this phenomenon we see the colour.



Figure 3.3.1 Colours

In the beginning man's life was governed by two factors - night and day, associated with dark and light, sleep and activity. The colours dark blue of the night-sky and bright yellow of daylight are still the colours of quiet passivity and heightened energy respectively.



There are few terms which describe attributes of colour. They are hue, tint, shade, tone and colour schemes.

- ★ **Hue:** Purest form of any colour is defined as hue.
- ★ **Tint:** Tint is created by adding white to a hue (pure colour). It is termed as light value of a hue. For example, mauve is a tint of violet, and pink is a tint of red.

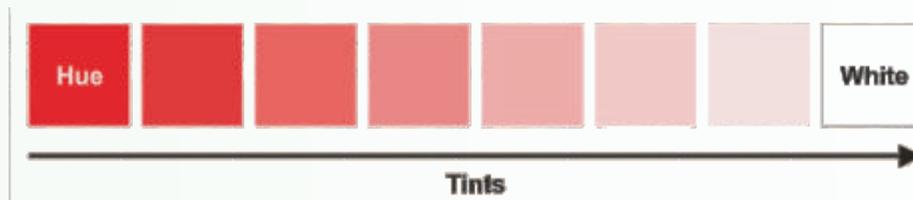


Figure 3.3.2 Tints

- ★ **Shade:** Shade is created by adding black to a hue (pure colour). It is termed as dark value of a hue. For example, maroon is a shade of red, and moss green is a shade of green.

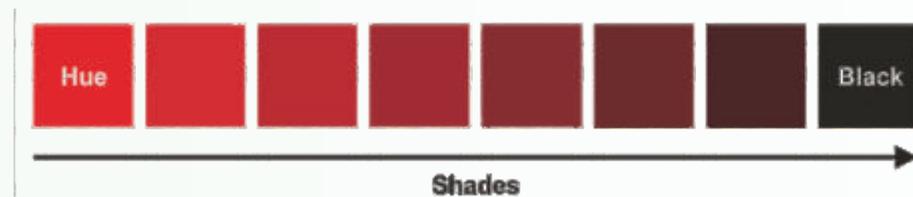


Figure 3.3.3 Shades

- ★ **Tone:** Tone is created by adding grey (white and black) to a hue. It is termed as saturated form of a hue. For example, dull rose is a tone of red, and dull blue is a tone of blue.

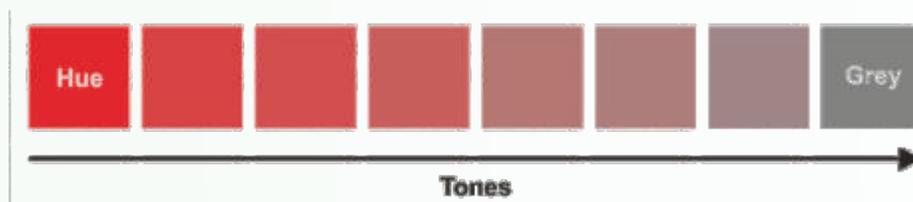
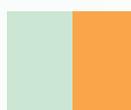


Figure 3.3.4 Tones

Usages of colours are as follows:

- ★ Enhancing visual appearance
- ★ Obstructing visual continuity



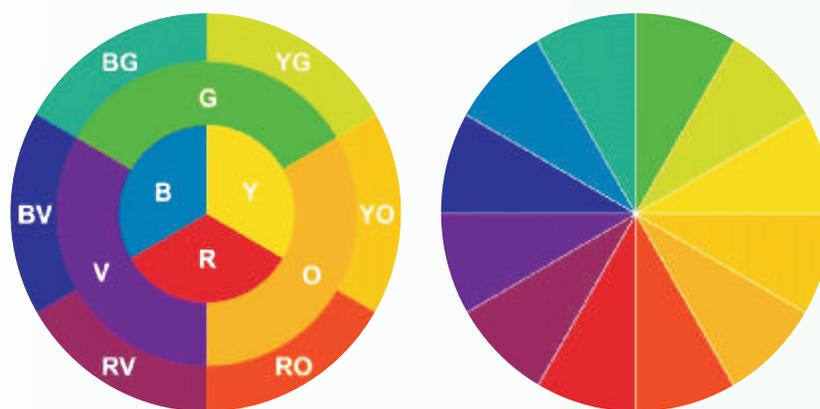


- ★ Attracting attention
- ★ Creating contrast or blend
- ★ Softening or hardening of forms
- ★ Evoking emotional response

3.3.1 Colour Theory: The Prang System

The color wheel is the basic tool for deriving colour schemes. Based on the scientific theory of light, colours are classified in the following groups:

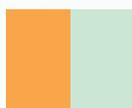
- ★ **Primary Colours:** Primary colours cannot be formed by mixing any combination of other colors. All other colors are derived from these three primary colours. The three primary colours are Red, Blue and Yellow.
- ★ **Secondary Colours:** They are achieved by mixing any two primary colours in equal proportion. They are Orange (Red + Yellow), Green (Yellow + Blue) and Violet (Red + Blue).
- ★ **Tertiary Colours:** They are achieved by mixing one primary and one secondary colour in equal proportion. They are Red-Violet, Red-Orange, Blue-Violet, Blue-Green, Yellow-Green and Yellow-Orange.



R: Red B: Blue Y: Yellow G: Green V: Violet O: Orange

BG: Blue Green YG: Yellow Green YO: Yellow Orange RO: Red Orange RV: Red Violet BV: Blue Violet

Figure 3.3.5 Colour Wheel





3.3.2 Colour Schemes

- ★ **Triadic Colour Scheme:** Any three colors with a balanced triangular relationship collectively make Triadic Colour Scheme. The basic triad consists of three colors equidistant on the color wheel. The best known of all color schemes are: the primary colors, red, yellow, and blue; the secondary colors, orange, green and violet. It is illustrated in a colour wheel placed at Figure 3.3.6.

Figure 3.3.7 depicts triadic colour scheme in real life situation in which red, yellow and blue are visible in a combination.

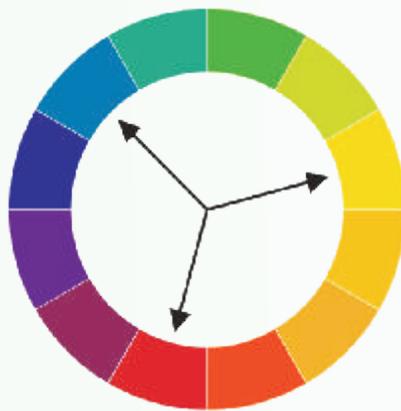


Figure 3.3.6 Triadic Colour Scheme



Figure 3.3.7 Triadic Colour Scheme

- ★ **Complimentary Colour Scheme:** Complimentary colors are any two colors, which are situated directly opposite each other, such as red-green, yellow-violet and blue-orange. These opposing colors create maximum contrast and maximum interest. This scheme combines colours of totally opposite nature hence it appears active and emphatic. It is illustrated in a colour wheel placed at Figure 3.3.8 which shows a combination of yellow and violet.

Figure 3.3.9 depicts complimentary colour scheme in nature which shows a combination of red and green.



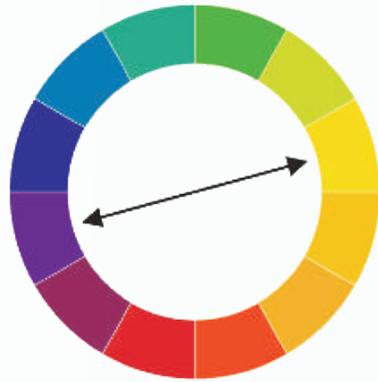


Figure 3.3.8 Complimentary Colour Scheme



Figure 3.3.9 Complimentary Colour Scheme

- ★ **Analogous Colour Scheme:** Analogous colors are any three colors, which are situated side by side on a color wheel. For example yellow-green, yellow and green in a group work as analogous colour scheme. They look pleasant and harmonious collectively because they are closely related. It is illustrated in a colour wheel placed at Figure 3.3.10 which shows a combination of yellow, yellow-green and green.

Figure 3.3.11 depicts analogous colour scheme in nature which shows a combination of yellow, yellow-green and yellow-orange.



Figure 3.3.10 Analogous Colour Scheme

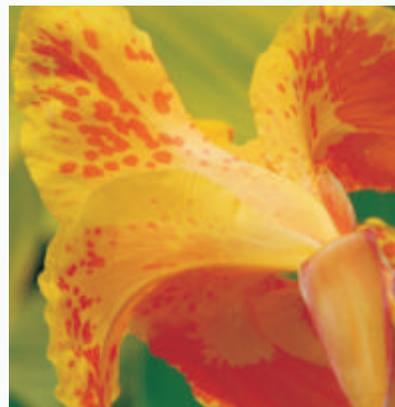


Figure 3.3.11 Analogous Colour Scheme





★ **Monochromatic Colour Scheme:** In this scheme a single colour or hue is used in combination with its tints, shades and tones. Due to the usage of single colour the monochromatic colour scheme appears very soothing, subtle and pleasing to the viewer. Figure 3.3.12 depicts monochromatic colour scheme in real life situation in which tints and shades of red are visible in a frame.



Figure 3.3.12 Monochromatic Colour Scheme

3.3.3 Colour Palette

The colour palette is a group of chosen colours used in different combinations to create a particular design or a set of designs under one collection. The tints, shades and tones of chosen colours can also be used in the same colour story.

A colour palette is depicted in Figure 3.3.13 along with its usage in a bedding collection.



Figure 3.3.13 Monochromatic Colour Scheme

3.3.4 Colour Psychology

The meaning of colour applies to many areas of design. Colour sends messages and expresses feelings. Colour is a means of instant communication. A detailed passage on some colours will explain the messages and meanings they convey.





- ★ WHITE is the colour of heaven, a quiet silence, peace, purity and the presence of God. White stands for clarity, simplicity, innocence and delicacy. "White is gently romantic or starkly modern depending on how you use it"- The statement by Hilary Mandleberg, beautifully describes another meaning of the colour white. The colour white has different or opposite connotations in different communities. A Christian bride wears a white wedding gown for her wedding symbolizing purity and innocence. White colour among Hindus is the colour of mourning and death. A Hindu widow often wears white.

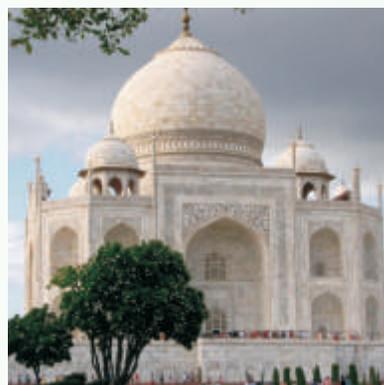


Figure 3.3.14 The white Taj Mahal symbolizing Love and Purity

- ★ BLACK is powerful and empowering. In the world of fashion it is a colour most worn in cocktail parties and fashion shows. Black makes a statement of style, elegance, glamour, modern yet classic and sophisticated. Black has always had a strong presence in fashion as well as in all areas of design. The shining black Limousine and the glossy black of the Steinway grand piano are great examples of classic elegance and opulence. While at one hand Huey Newton an African-American and founding member of the Black Panther party states, "black is beautiful", on the other hand black is strongly associated with fear, death, hopelessness, gloom and sadness.

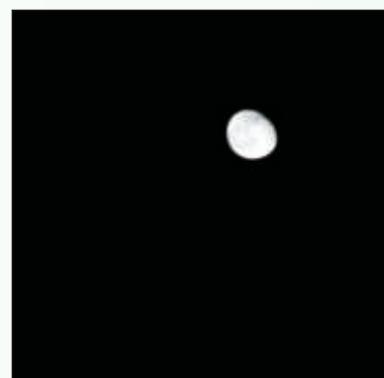


Figure 3.3.15 Black

- ★ RED symbolizes the heart, the strong-willed and strong emotions. The colour red is bold and an attention-getter which is why we find it being used on window displays and at the traffic signals. It instantly makes us act and react. Red is the colour of blood and bloodshed. The colour red is the most sensual amongst all the colours. It is the most passionate, provocative and romantic colour. Hence, we find red used extensively in ladies cosmetics, clothes and packaging. Red is the colour of festivity, celebration, adventure and youth. In India, red is considered auspicious hence we see this colour used in bridal wear and wedding decorations.



Figure 3.3.16 Red



- ★ **YELLOW** instantly connects to the words sun, sparkling, warm and energy. It is the opposite of dark, dull or hazy. It is as an extrovert colour. Lively, open, clear and bright. It is the colour of hope, happiness and optimism. Golden yellow symbolizes opulence, luxury and divinity.



Figure 3.3.17 Yellow

- ★ **BLUE** is the colour of the calm sky, deep night sky, clear blue water and the deep ocean. Blue symbolizes



Figure 3.3.18 Blue

royalty and grandeur. The colour blue ranges from the soft light blue to rich royal blues to deep and dark blues. The lighter tints of blue symbolize softness sensitive emotions, hope and peace while the dark blues are associated with depth, authority, strength and reliability. We therefore find doctors, nurses and hospitals using light, fresh and calming blues while dark blue is used in uniforms and banks conveying dependability and authority.

- ★ **GREEN** is the most soothing colour to the eye. There are numerous shades of green we see in nature. The fresh green of leaves, tender shoots and grass symbolize new, refreshing, growth, organic, youth, health, relaxing, stress-free. The dark green of the forest symbolizes strength, trustworthy, determination and prosperity. The olive green and the mossy green symbolize military, safari and camouflage.

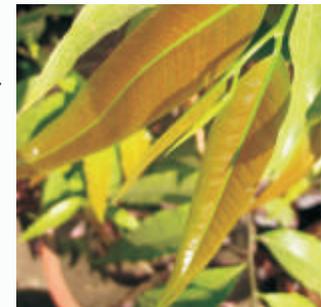


Figure 3.3.19 Green

- ★ **ORANGE** is the optimistic, joyful and lively. It instantly connects our



Figure 3.3.20 Orange

mind to tangy oranges, juicy-citric drinks and spicy foods. We find different shades of orange in natural foods like carrots, pumpkin, tangerine, mandarin, melon, mango and in flowers like marigold and nasturtium. When compared to colour red, it is seen as a friendlier and less aggressive colour. It emits thoughts of adventure, fun-loving and outdoor-sports. Orange is an auspicious colour for people following Buddhism, symbolizing success and long life.





Deep terracotta orange or brick orange symbolizes warmth, down-to-earth, pragmatics in and abundance.

- ★ VIOLET is associated with words like magical, blooming, mysterious allure and feminine. It ranges from ethereal lavender, mauve, purple to deep violet. The lighter tints symbolize aging and femininity while the darker shades symbolize royalty and exclusivity. We find various violet flowers and foods in nature like orchids, irises, berries, grapes and plums known for their unique appearance and taste, therefore the notion of exclusivity always accompanies colour violet. Being soft and feminine lavenders and mauves are extensively used in ladies cosmetics, clothes, nightwear and lifestyle accessories.



Figure 3.3.21 Violet Flowers in Nature

EXERCISE 3.3

Fill in the blanks

1. Light value of a hue is termed as _____ and dark value of a hue is termed as _____.
2. _____ colours are achieved by mixing any two primary colours in equal proportion.
3. A pair of two colors, situated directly opposite each other in a colour wheel is termed as _____ colour scheme.
4. _____ colour symbolizes the strong-willed and strong emotions.

Match the following:

Analogous colour scheme	Achieved by mixing one primary and one secondary colour in equal proportion
Tertiary colours	Set of three colors, situated side by side in color wheel
Tone	Symbolizes silence, peace and purity
White	Termed as saturated form of a hue

Review Questions

1. Define hue, tint, shade and tone of colour.



2. Describe usages of colours in design.
3. What do you understand by the term 'colour-palette' and explain its relevance in design?
4. How are secondary and tertiary colours formed?

ACTIVITY 3.3.1

This activity will assist the students to derive different colour combinations from existing visual resources.

1. Select a colorful picture from a magazine.
2. Find out the main colours present in the selected picture.
3. Choose six colours and create a color palette using them.

ACTIVITY 3.3.2

This activity will enable students to apply different colour schemes in the process of designing objects.

1. Sketch any 1 object four times
2. Apply 4 different colour schemes to each of them.

3.4 PRINCIPLES OF DESIGN

After the familiarization with the basic Elements of Design it is important to know how to utilize them. The fundamental requirement for design creation is elements of design. They are considered as objects, constituents or ingredients for making a design. The Principles of Design ascertain the manner in which the constituents (elements of design) are organized to create a framework for design. In other words they guide the arrangement of elements within a design composition. They are termed as designers' tools for design solutions.

The fundamental Principles of Design are as follows:

3.4.1 Rhythm

There is a profound rhythm visible in nature and life - in walking, running, and breathing; in the seasons, phases of moon, tides of the sea, voices of animals, birds and insects. Rhythm is the recurrence or alternation of design elements, often with defined intervals between them. It creates a





sense of movement to the observer. The principle of rhythm is employed to arrange the elements for creating patterns and textures. Rhythmical repeats are found in age-old craft techniques like basket making, weaving and knitting. Examples depicting rhythm in nature and architectural forms are placed at Figure 3.4.1 and 3.4.2.



Figure 3.4.1 Rhythm in Nature



Figure 3.4.2 Rhythm in Architecture

Three different kinds of rhythm are defined by the feelings they evoke.

- ★ **Regular Rhythm:** An element or a set of elements is repeated at regular intervals when the design is governed by principle of regular rhythm.
- ★ **Flowing Rhythm:** It is defined as visual movement relates to continuance of an element used in design creation. This kind of visual rhythm is often more organic in nature. An interesting example of flowing rhythm in lifestyle products is placed at Figure 3.4.3.
- ★ **Progressive Rhythm:** A progressive rhythm encompasses visual sequencing of forms through progression of steps. This effect is often achieved by increasing or decreasing occurrence of design elements.



Figure 3.4.3 Flowing Rhythm in a Product



3.4.2 Balance

Balance relates to the visual weight of elements within a design. It is defined as harmonious relationship between the positive and negative spaces of a design.

In other words the attribute of balance is experienced due to visual equality of positive and negative spaces. Balance is categorized in two forms: symmetrical and asymmetrical. Figure 3.4.4 and 3.4.5 shows presence of symmetric balance in architectural forms and lifestyle products.



Figure 3.4.4 Symmetric Balance in Architecture



Figure 3.4.5 Symmetric Balance in Product

★ **Symmetrical Balance:** This balance occurs when the visual weight of a composition is evenly distributed on both sides of vertical axis or horizontal axis or diagonal axis in a design. This implies the formation of identical mirror images on both sides of the axis. Presence of an axis is a clear demarcation between symmetrical and asymmetrical balance. A checkered board is an example of an absolutely symmetrical balanced composition. Figure 3.4.6 and 3.4.7 depicts presence of symmetric balance in apparels and lifestyle accessories.



Figure 3.4.6 Symmetric Balance in Apparel



Figure 3.4.7 Symmetric Balance in Accessory





- ★ **Asymmetrical Balance:** In this case the axis of symmetry is not present in the design but the weight of a composition appears to be evenly distributed. It involves the arrangement of elements having different sizes and nature in a fashion that they balance one another with their respective 'visual weights'. For an example several smaller forms in a design counterbalance a dominant form. Usually asymmetrical designs tend to have a greater sense of visual interest than symmetrical designs. Figure 3.4.8 and 3.4.9 shows presence of asymmetric balance in lifestyle and decorative products.



*Figure 3.4.8 Asymmetric Balance
in a mobile cover*



*Figure 3.4.9 Asymmetric Balance
in a piece of jewellery*

3.4.3 Emphasis

The presence of Emphasis communicates varying degrees of visual dominance in a design. In other words visual weight of the design is unevenly distributed in a manner that a particular portion of the design grabs more attention than the rest.

This principle is the tool that highlights and underlines that which is to be communicated. It is used to attract attention of the observer in one area of a presented design. Emphasis when used appropriately adds a visual interest which harmony cannot produce. Figure 3.4.10 and 3.4.11 depicts presence of emphasis in nature and decorative products.



Figure 3.4.10 Emphasis in Nature



Figure 3.4.11 Emphasis in a Product



3.4.4 Contrast

Contrast is defined as juxtaposition of opposing elements in a design. Presence of contrast brings more clarity in communication of intended design concept. The principle of contrast is associated with comparison of elements within a design. It shows an interesting arrangement of multiple elements based on their prioritized visual importance. It is also used to add focus or emphasis in a visually active design composition. Contrast can be achieved by following means:

- ★ **Size Contrast:** The elements of same shape are used in differing sizes.
- ★ **Shape Contrast:** The elements of approximately same size are used in differing shapes.
- ★ **Texture Contrast:** The elements of same shape and same size are used with different textures.
- ★ **Position Contrast:** The elements of same shape are used in different positions or angles.
- ★ **Colour Contrast:** The elements of same shape are used in different colours. An example of colour contrast is placed at Figure 3.4.13 in which same forms are present in two different colours.
- ★ **Value contrast:** The elements of same shape are used in different values of same colour. An example of colour contrast is placed at Figure 3.4.12 in which similar forms are captured in a frame having varying values of a colour.



Figure 3.4.12 Contrast in Nature



Figure 3.4.13 Contrast in Product

We have thoroughly explored the fundamental concepts in the design domain. The understanding of elements and principles of design change our way of looking at the world. They provide the designer with a fundamental set of tools to begin working within the field of design.





EXERCISE 3.4

Fill in the blanks

1. The recurrence or alternation of design elements, often with defined intervals between them is termed as _____.
2. _____ rhythm achieved by increasing or decreasing occurrence of design elements.
3. Visual equality of positive and negative spaces in a design is termed as _____.
4. _____ is used to attract attention of the observer in one area of a design.

Match the following:

Rhythm	Comparison of elements within a design
Checkered board	Particular portion of the design grabs more attention than the rest
Emphasis	Symmetrical balance
Contrast	Creates a sense of movement to the observer

Review Questions

1. What are major principles of design?
2. Describe three different types of rhythm.
3. Define emphasis and its relevance in design.
4. Explain three different means of achieving contrast in designs.

ACTIVITY 3.4.1

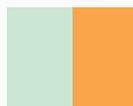
This activity is proposed to enable students to appreciate the principles of design occurring in nature and how they play an important role to impart aesthetics.

1. Visit a nearby park and select five natural forms like flower, leaf, tree, plant, insects, rocks etc.
2. Observe and analyze the selected natural forms and identify the principles of design (balance, rhythm, emphasis and contrast) present in them.



ACTIVITY 3.4.2

1. Using the Elements of Design like points, lines and shapes, fill-in a design pattern within the shirts given below.
2. In Shirt -I arrange the Elements of Design in order to show the Principle of Emphasis.
3. In Shirt -II arrange the Elements of Design in order to show the Principle of Rhythm.





GLOSSARY

- Graphic:** Related to visual art, picturesque and vivid.
- Sketch:** A rough drawing intended to serve as the bases for a finished picture. In other words it is a simply or hastily executed drawing or painting, especially a preliminary one, giving the essential features without the details.
- Viability:** Capability of becoming actual, useful and practicable.
- Prototype:** It is the original model on which something is based or formed. A product's prototype is tested before it is manufactured commercially so that the design can be improved if required.
- Contemporary:** It refers to the characteristic of the present. Contemporary design is ever changing as it belongs to the current moment.
- Mandarin:** A small citrus, loose-skinned fruit (*Citrus reticulata*), native to China, orange-yellow to deep-orange in colour.
- Pragmatic:** Pertaining to a practical point of view.
- Progression:** Progression refers to step by step gradual movement.
- Evoke:** Evoke means to call forth or call to mind emotions, feelings and responses.
- Knitted:** A garment or a fabric made by interlocking loops of one or more yarns either by hand with knitting needles or by knitting machines.
- Contours:** The edge or outline that defines a shape.
- Tactile:** Relating to a sense of touch.
- Camouflage:** Hiding, concealment by some means that changes the original appearance.
- Shape:** When a line crosses itself or intersects with other lines forming an enclosed space, a shape is formed.
- Gathering:** Gathering is a sewing technique in which running stitches are sewn along one edge and stitching threads are then pulled or drawn-up. As a result the fabric forms small folds along the pulled threads.



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03



- Tuck:** Tuck is a fold, or one of a series of folds, made by doubling cloth upon itself and stitching parallel with the edge of the fold.
- Hue:** Purest form of any colour is defined as hue.
- Value:** Value refers to lightness or darkness of a hue.
- Colour Palette:** It is a group of chosen colours that are used in different combinations to create a particular design or a set of designs under one collection.
- Rhythm:** Rhythm is the recurrence or alternation of design elements, often with defined intervals between them.
- Balance:** It relates to the visual weight of elements within a design. It is defined as harmonious relationship between the positive and negative spaces of a design.
- Contrast:** Contrast is defined as juxtaposition of opposing elements in a design.
- Emphasis:** The visual weight of the design is unevenly distributed in a manner that a particular portion of the design grabs more attention than the rest.
- Heterogeneous:** Composed of parts of dis-similar nature creatively visual activity.





Elements of Garment Making

4.1 ELEMENTS OF GARMENT MAKING

This part of the course introduces the student to the skills required for converting fabrics into a stitched garment. It is a very important skill that gives hands-on experience in assembling a garment. 'Elements of Garment Making' is an introduction to the basic skill of sewing which is essential to convert the design on paper into a garment.

Sewing can be defined as a craft of attaching or fastening fabrics or other materials with help of needle and thread. In the Stone Age people used bone or ivory needles to sew skin and fur of animals for clothing using the thread that was also from animal body parts. Garments continued to be sewn by hand nearly till the mid of 19th century when first sewing machine was patented by Elias Howe, Jr. in 1858. Isaac Singer designed a machine with a foot treadle.

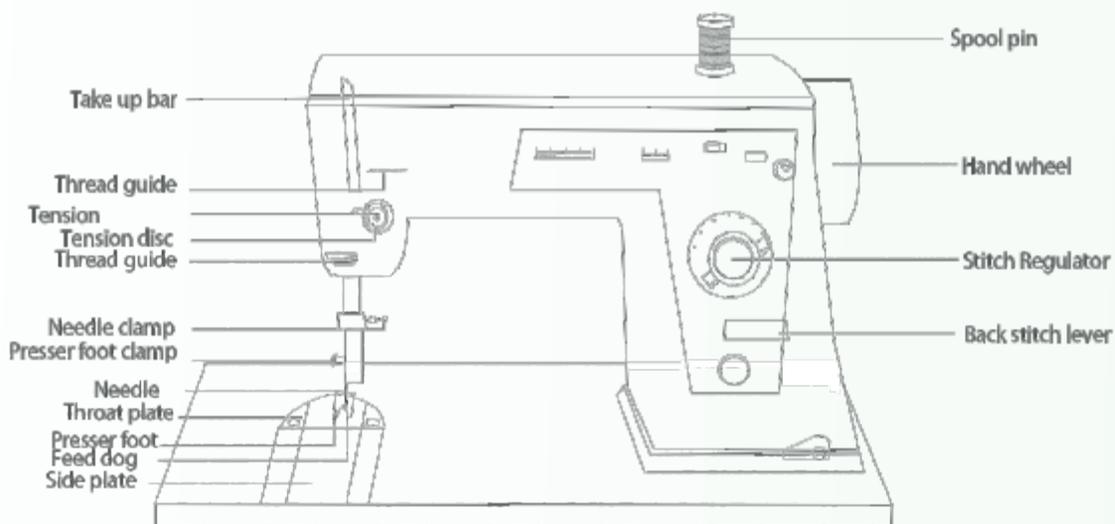
4.1.1 Sewing Machine

Sewing Machine is an important tool of sewing equipment. There are several machines in the market, each with its own desirable features and advantages. Machines range from most basic, which have only simple lock stitch to the electronic machines which use advanced computer technology, and have various advanced functions for attachment of piping, binding, ruffles, pleating, darning, hemming and can even makes button holes and attach fasteners. A basic requirement of any sewing machine is a precisely timed movement of the needle and shuttle to manipulate thread from top and bottom to form a stitch. The presser foot in the machine holds the fabric in place and pushes it in front for formation of seam.

4.1.2 Lockstitch Machine

The single needle lock stitch is the most used machine in the industry globally. The chain stitch machines and over edge machines are generally used for knits.

A basic understanding of how the machine operates will enable you to use any machine efficiently and correct stitching defects. The simple lockstitch machine is also called a flat bed machine and it makes only straight stitches. The stitch looks same from both the sides; it is absolutely flat, most supple, completely secure and is the least conspicuous stitch. If it breaks during use, it does not open up because the two threads are locked together. This is the reason why it is also called a lockstitch.



The lockstitch is formed with the needle thread that feeds from a spool at the top and a bobbin thread that feeds from a bobbin at the bottom. When formed correctly, the amount of thread used from the top and bottom is equal and the threads lock in the centre of the fabric.

4.1.3 Types of Lockstitch Machines

If we broadly classify there are two types of lockstitch machines. The lockstitch power machine is similar to lockstitch home sewing machine. However, there are some important differences:

1. The power machine is much faster. It stitches an average of 5000 stitches per minute. Whereas an average home machine stitches no more than 800 stitches and a hand sewing machine would stitch a maximum of 300 stitches per minute.
2. The presser foot in a power machine is controlled with a knee lift but in a home sewing machine it is operated manually using a lever at the back of needle bar.
3. The throat plate in a home sewing machine is often marked with seam guides, which is not there on industry machines.
4. In the industrial sewing machine or power machine the presser foot has a narrow opening between the two toes and it holds fabric more securely and firmly.
5. The industrial sewing machine or power machine has a small and round needle hole on the throat plate than the home sewing machine, which is large and oval. This reduces stitching problems.



4.1.4 Parts of Sewing Machine:

It is important for the beginner to know and recognize the different parts of the sewing machine.

Arm: The horizontal upper part of the head which has the mechanism for handling upper thread and driving the needle.

Back Stitch Lever: A lever located at the lower right hand side of the machine and its basic function is to form the stitches in reverse direction.

Bed: The lower portion of the machine, i.e. stand under which the mechanism for handling lower thread including the shuttle and feed are mounted.

Bobbin: A small metal spool that holds the lower thread supply.

Bobbin case: The metal case that holds the bobbin. It has tension springs that control the pressure on the bobbin thread.

Bobbin Winder: It is a simple mechanism for winding the thread on the bobbin and is located at the right hand side near the wheel.

Feed Dog: A small metal device under the presser foot that has teeth which carries the material along as it is stitched. It moves the material forward, by one stitch length, after each stitch has been drawn.

Handwheel: Handwheel is located on the right side of the machine. It is driven by hand or belt in the domestic machine and with the help of belt in the industrial machine. It controls the movement of the needle bar and drives the machine.

Hand Lifter: To lift the presser foot by hand.

Head: The upper part of the machine above the stand. It is a complete sewing machine without the bed.

Knee Lifter: To lift the presser foot by knee.

Needle Bar: A bar at the end of which the needle is attached.

Pan: It is the metal pan under the head that catches oil, lint, broken threads.

Presser Foot: A foot which is used to hold the fabric while stitching. It is detachable and different types of foot are available for different functions e.g. zipper foot, plastic foot.



Presser Foot Lifter: A lever attached to the presser bar to lift up & down the presser foot.

Shuttle: A device that carries the needle thread around the bobbin and forms the lock on the lock stitch.

Stitch Regulator: The length of the stitches is determined by graduation marks on the stitch regulating screw. As you increase the numbers on regulator the number of stitches per inch increases i.e. the size of the stitches decreases and vice versa.

Tension Regulator: It is a mechanism which controls the tension of upper thread and the quality of stitches. The tension of the thread is adjusted with the help of spring and nut which controls the pressure on the disc.

Thread stand or Spool Pin: It is a metal rod fitted either on top or on side of the stand to hold the thread spool.

Thread take up lever: A bar/lever which is located above the tension regulator. It moves up and down. It has a hole through which the thread passes. It feeds thread to the needle and it also tightens loop formed and locks it.

Throat Plate: A semicircular disc with a hole to allow needle to pass through it and also has marking in some cases which are used as guidelines while stitching.

4.1.5 Threading The Machine

Upper threading

Unless a machine is threaded in right sequence correctly, it won't work properly. Every machine has a slightly different sequence, but overall it is basically the same. The thread is fed from the spool through the tension discs, then through the 'take up lever' before it is threaded through the needle.

Before threading the machine,

- (1) Raise the presser foot
- (2) Always have the 'take-up lever' to its highest point before threading

Steps

1. Place spool of thread on spool pin. Be sure nick on spool will not catch thread as it is reeled off spool. Take hold of thread end.



2. Pass thread end through first thread guide.
3. Bring thread down toward the tension assembly.
4. Pass thread under and around tension discs, taking care that it falls between two of the discs.
5. Pull thread upward and then let it go slack. This allows thread to be caught by the hook and thread check spring, which together hold thread in position between tension discs (see single-unit tension assembly below).
6. Bring thread up and behind next thread guide.
7. Pass thread into the take-up lever.
8. Bring thread down and through thread guides.
9. Pass thread end through eye of needle, being sure that it goes in proper direction for machine. Pull at least 3" of thread through needle.

4.1.6 Filling In The Bobbin/bobbin Winding

The lower thread supply for any sewing machine is stored in the bobbin area.

The thread should be wound evenly onto the bobbin. Unevenly wound bobbin may cause trouble in stitching.

Fill the bobbin using the bobbin-winding mechanism on the machine. There are different bobbin filling mechanisms. The needle must be unthreaded / disengaged before winding. Click the bobbin-winding mechanism into place. The bobbin will fill automatically to the correct level.

4.1.7 Lower Threading

Threading the lower portion of the machine involves threading the bobbin and fitting the bobbin into its case.

Insert the filled bobbin into the bobbin case so that the thread is pulled back on itself through the spring.

Fit the bobbin case into the machine, holding the case by the lever on the back. The open lever locks the bobbin into the case.

Push the case into the socket until it clicks then release the lever, close the cover. If it does not click, the mechanism inside is not aligned.



4.1.8 Raising The Bobbin Thread

To raise the bobbin thread, thread the needle, holding the top thread, turn the hand wheel with the other hand until the needle has gone down in the bobbin area.

Bring the needle up again to the highest point, still holding the thread and rotating the hand wheel. With the needle, a loop of bobbin thread will also come up.

Pull the upper thread to bring the bobbin thread out. Take both threads through the pressure foot and bring them toward the back. The thread ends should be at least 2" - 3" long.

4.1.9 Stitch Tension

Tension controls increase or decrease in the pressure on the threads as they are fed through the machine.

When pressure is correct in both threads, the tension is balanced; the threads interlock in the middle of the material to make a perfect or balanced stitch. The seam is flat and elastic without being loose and there is no seam grin when the seam is stressed.

If there is too much pressure on the tension discs, not enough thread is fed into the stitching and the tension is tight. The material puckers, the seam is strained and the stitches break. If there is too little pressure, too much thread is fed, the tension is too loose and the seam is loose and weak. The link position is a good indicator of which thread tension is incorrect.

When the tension on the top or needle thread is too tight or the tension on the bottom or bobbin thread is too loose, the top thread lies along the surface of the material and the bobbin thread forms loops on the top.

When the tension of the top or needle thread is too loose or the bottom or bobbin thread is too tight, the bottom thread lies along the underside of the material and the top thread forms loops on the underside.

Adjusting the tension

The top thread tension regulator, situated on the front of the machine adjusts the tension discs. To decrease tension, turn dial to lower number. To increase tension, turn dial to a higher number.

Bobbin thread tension is controlled by a screw on the bobbin. Clockwise turning increases the tension whereas anti-clockwise turning decreases tension.



4.1.10 Pressure and Feed

Pressure means the downward force exerted on the fabric by the presser foot, to hold the layers so that they move together evenly during stitching. The feed exerts upward force that moves the fabric to the back of the machine. The two forces pressure and feed, work together to produce properly stitched seam. Pressure has several functions. It holds the fabric layers in such a way that they move evenly with one another. It holds the material taut to prevent flagging and it helps to assure that the stitches are properly set in the material and that an even stitch tension, and stitch length are maintained. Pressure also prevents the fabric from being pulled down into the bobbin area and hugging the needle, which can cause skipped stitches.

The primary function of feed is to move the fabric into position for each stitch. Feed also helps in holding the fabric layers taut during stitch formation. Feed is controlled by the stitch length regulator. The smaller the stitch length setting, the shorter the distance the feed moves the fabric for each successive stitch.

The amount of pressure needed depends on the weight and thickness of the material. Lighter and thinner the fabric weight, the lighter the pressure needed and vice versa.

ACTIVITY

1. Visit the market and identify various sewing machines from different brands and note their prices. Co-relate the prices with functions that a machine can perform. Prepare a short report of about 5-6 pages.
2. List differences between industrial sewing machine and domestic sewing machine based on your survey of the market.

Fill in the blanks:

- a. Sewing can be defined as a _____ of _____ or _____ fabrics or other materials with help of _____ and _____.
- b. _____ designed a machine with a foot treadle.
- c. The lockstitch is formed with the _____ thread that feeds from a _____ at the top and a _____ thread that feeds from a _____ at the bottom.



- d. Feed Dog is a small _____ under the _____ that has teeth which carries the material _____ as it is stitched.
- e. _____ is a semicircular disc with a hole to allow needle to pass through it.
- f. The amount of pressure needed depends on the _____ and _____ of the material.

Review Questions

1. Differentiate between Lockstitch power machine and home sewing machine.
2. List the steps to be followed in sequence for Upper Threading of a sewing machine.
3. Explain the purpose of any 5 parts of the sewing machine.

4.2 SEWING TOOLS AND SAFETY RULES

4.2.1 Needles

Machine needles are selected according to the weight and other characteristics of the fabric, as well as the thread type being used for construction. Generally, a needle should be fine enough to penetrate the fabric without damaging it and yet have an eye, which is big enough so that the thread does not fray or break. Needles come in various sizes, from very fine (**size 7**) for lightweight fabrics to thick (**size 18**) for very heavy weight and dense fabrics.

Needles also come in three different tips/ points:

- ★ **Regular sharp needle:** this is ideal for mostly all woven fabrics because it helps produce even stitching with minimum puckering.
- ★ **Ball -point needle:** the slightly rounded tip is recommended for all knit fabrics and elastic fabrics as the needle pushes between the fabric yarns instead of piercing them. Available in **sizes 7-16** where the point is rounded to, in proportion to the needle size, points of larger sizes being more rounded than finer ones.
- ★ **Wedge point needle:** this needle has been specially designed for leather and vinyl, as it easily pierces these fabrics to make hole that closes back upon itself. This avoids unattractive holes in the garment and also reduces the risk of stitches tearing the fabric. Available in **sizes 11-18**, size 11 is used for soft and supple leather and size 18 being used for heavy or multiple layers of leather.



Needles should be chosen carefully for different fabrics. If a needle is of the wrong size, the machine stitch formation is affected. If it is too fine the thread might fray. If it is too coarse it may damage the fabric and the stitches will look imbalanced.

Care should also be taken to ensure that the needle is neither damaged nor dirty. A needle that has a burr on the point, eye, or the groove may cause the thread to break or fray or even the fabric might get damaged. A blunt or bent needle can cause a thumping noise in the sewing machine as it penetrates the fabric and may also result in pulling the fabric or in skipped stitches in the seam lines.

4.2.2 Thread

With the wide and ever increasing range of fabrics available in the market, it is important to know the right **sewing thread** for the various types of fabrics. The right kind of thread is important in sewing as the both the thread and the garment should share the same characteristic, as they have to be laundered and ironed together, they should shrink and stretch together.

Types of threads: The **natural fibre threads** available in the market are cotton and silk. Cotton thread comes in two varieties mercerised and non-mercerised. Mercerised cotton is stronger and has lustre. Silk thread is an all-purpose thread and combines strength with elasticity, but is not easily available in India in small spools. It is generally used for over- lock machines in the industry. The **synthetic threads** are usually made from polyester and Terylene thread. This thread is stronger than the natural thread and has an important feature of being elastic, which is particularly important while stitching knits or lycra based fabrics. There is tremendous amount of strain on seams in active sports wear, swimwear or during movement, use of this thread minimises the chance of broken stitching. Synthetic thread is also useful in stitching of leather as it has a good deal of stretch in it. But **cottons or linens** should not be stitched with synthetic thread, as the thread will not be able to withstand the heat while being ironed. **Wool and silk** should preferably be stitched either with mercerised cotton or silk threads only. **Blended fabrics** may be stitched with synthetic thread suitable to the dominant fibre in its content.

Threads, whether natural or synthetic, are produced in **various thickness:** higher the number finer is the thread and smaller the number coarser is the thread. The threads are available in sizes 30-60. It is important to remember that the same thread should be used for the bobbin and top spool.

Threads for decorative stitching: For decorative stitching such as saddle stitching, topstitching a special thread called buttonhole twist (it is also sold in the market as no. 20/30 thread) is used, to



emphasis stitching. It may only be used in spool or bobbin, this is an exception to the rule. Use a 40 size mercerised cotton thread as a companion to it. The yellow coloured top stitching thread used on denim jeans is a commonly used buttonhole twist thread.

Always choose a thread a shade or two darker than the fabric as in the long run; it will look the same as the fabric colour. Buy good quality and branded thread even if it is expensive, as it will last longer and be cost effective. Before one starts sewing, a test of the seam strength should be done on a double scrap of the same fabric, to check if it has right appearance, correct tension and if it is a pucker-less seam. Puckering will mean that either the needle is not correct or there are too many stitches per inch. Adjust the tension of the machine and test till one is satisfied. It will be worth an effort.

4.2.3 Stitch Per Inch (SPI)

Perfect machine stitching is easy to achieve if you thread the machine properly and use the correct needle and thread suitable for the fabric used. A perfect stitch depends on the delicate balance of pressure on fabric action of the feed and tension on the stitch formation. The correct SPI or stitch per inch gives you a seam, which is neither too tight nor too loose.

4.2.4 Safety Rules

Safety Rules to be observed while working on the machine: Safety is important to everyone and it is ones responsibility to maintain a safe working place.

1. When operating the machine, do not be careless.
2. Always inspect the machine before starting the work. Be sure it is clean and threaded correctly, with no loose threads on the pulley belt and all guards in place.
3. When in doubt, ask the teacher.
4. Report any injuries or accidents immediately to the teacher.
5. Wipe up any oil spilled on the floor immediately to prevent anyone from slipping.
6. Operate machines only with permission.
7. When sewing on a power machine, wear low shoes and close-fitting clothing. Avoid loose-fitting sleeves, sweaters, jewellery, ties and ribbons when operating the machine. If your hair is long, tie it at the back.



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8. Do not tilt your chair forward or backward while operating the machine.
9. Use both hands to raise and lower the machine head.
10. Always keep your head above the table.
11. Keep your feet off the treadle when you are not operating the machine.
12. Keep your feet off the treadle when you are setting or threading the needle.
13. Turn the motor off when you are not stitching.
14. Turn the motor off before cleaning, oiling or adjusting the machine.
15. Turn the motor off before removing or replacing the pulley belt and run the machine out. Wait until all motion has stopped.
16. Turn the motor off in case of an emergency or when in doubt.
17. Turn the motor off before unplugging the machine.
18. Do not use your hand to stop and start the handwheel.
19. Use your hand only to set the handwheel.
20. Before operating the machine, close the slide bed cover.
21. When operating the machine, keep your hands, scissors and other sharp objects away from the belt.
22. Keep the machine and work station clean with all tools in the side drawer.
23. Unplug the machine at the end of the day.
24. Know the location of the main power switch, outlets and fuses in case of an emergency.
25. Do not remove any safety devices from the machines.
26. Turn off the iron at the end of the class.
27. Always place the iron on the iron pad to avoid burning the ironing board cover.
28. When trimming or cutting, put all trimmings in the wastebasket.
29. Scissors should be handed to another person with the handles toward the person.
30. Never toss or throw scissors or equipment.
31. Do not eat or drink in the work area.



4.2.5 Sewing Aids

All pins: All pins are fine, long, rust proof pins. These are used for the following:

- ★ For attaching muslin pieces together.
- ★ For draping.
- ★ To fasten parts and pieces of pattern paper.

Magnetic pin holder / pin cushion: This is used for holding pins.

Muslin: A plain weave fabric made from bleached or unbleached yarns which vary in weight and in texture. Muslin is used to experiment and develop design concepts.

Push pins: Drum shaped 1/2" long pin. These are used for pivoting and transferring points, and to hold pattern pieces and fabric on table.

Tracing wheel: An instrument with small serrated or needle point wheel mounted on one end of a handle. This is used for transferring markings from paper patterns on the muslin.

Tailor chalk: 1½" X 1½" square of white or coloured chalk of wax. This is used for marking on fabric.

Notcher: It cuts a narrow U shape on paper pattern indicating seam allowance, centerlines, ease and dart intake.

12" / 24" scale: Long ruler 12" / 24" in metal or plastic to measure or mark straight lines.

Measuring tape: Metal tipped narrow, firmly woven double tape of cloth or plastic usually 60" long (150 cm) marked with both inches and centimeters.

Grading scale: A transparent straight plastic ruler of size 2" X 18" with grid in inches and fraction of inches (or millimeters).

Pencil: Used to mark lines in developing the muslin, pattern or sloper.

L-square: Plastic or metal ruler with two arms at right angles of varying lengths usually 12" and 24". It is used to square off corners and establish perpendicular lines, reference points and lines.

Dress form: A standardized duplication of a human torso, cotton padded and canvas covered, set on a movable, light adjustable stand and has compressible shoulders. It is used to take



measurements, develop pattern, fit garment samples, to alter garments, and to establish style lines for the garment.

Pattern paper: Strong white paper available in variety of weights and widths.

Newsprint paper: Thin and light weight paper used for rough drafts.

Thick brown paper: Strong brown papers used for finished patterns. It may be also used for preliminary patterns drafting and development of the final pattern.

Sloper/master/block/basic pattern making: A pattern of a garment, without style lines, or seam allowance developed from specific measurements of a given size, dress forms. Used as tool from which other patterns may be developed, to facilitate the development of original styles and to develop various bodice, skirt, dress, pants, sleeve designs.

Carbon paper: Coated paper on one side with white or coloured wax, used to transfer marking on fabric or paper.

Transparent tape: A clear plastic narrow continuous stripes with an adhesive surface on one side, available in roll. It is used to hold paper pieces and mend tears.

Paper shears/scissors: a cutting instrument, ranging in size from 8" to 12", with two sharply pointed straight blades. It is used to cut paper patterns.

Tailor's shears: A cutting instrument ranging in size from 12" to 16" with two wide blades. It is used to cut fabric and muslin.

Magnet: a high carbon alloy steel that has a property of attracting iron and steel can be of any shape. It is used to pick up pins and needles.

Pin cushion: A small firmly stuffed pillow made in a variety of shapes and sizes. It is used to hold pins, needles for easy accessibility and storage.

ACTIVITY

Prepare a safety chart for your Machine Room. Use pictures or drawings to highlight the important safety rules.

Fill in the blanks:

- a. Three different types of tips in needles are _____, _____ and _____.





- b. Needles size 7 is used for _____ fabrics and size 18 is used for very _____ and _____ fabrics.
- c. Higher the number, _____ is the thread and smaller the number, _____ is the thread.
- d. _____ is a standardized duplication of a human torso, padded with cotton and covered with canvas.
- e. As a safety measure, _____ the machine at the end of the day.
- f. SPI stands for _____.

Review Questions

1. What type of thread is used to stitch knit and lycra-based fabrics?
2. What are the different types of needles used in a sewing machine?

4.3 COMMON MACHINE PROBLEMS

The student needs to understand the common problems that may be there while sewing and should be able to rectify these as they are common and irritating and slow down the sewing process. A person operating the machine should be able to rectify these and solve the problems.

4.3.1 Bobbin

1. Does not wind :

- ★ Make sure the thread is wrapped around the bobbin in proper direction.
- ★ Check to see if bobbin has been placed properly in the winder.
- ★ The rubber ring might be worn out and needs to be replaced.

2. Winds unevenly :

- ★ The thread may not be inserted in the thread guide.
- ★ You may be running the machine too fast.
- ★ The tension spring may need adjustment.



3. The Needle moves up and down during winding

- ★ Needle has not been disengaged.

4.3.2 Fabric

1. Layers feed unevenly

- ★ Presser foot pressure incorrect.
- ★ May need to stitch slowly.
- ★ The fabric may be very light weight, use tissue paper while stitching.

2. Does not feed in straight line

- ★ Presser foot may be loose or bent.
- ★ Pressure of the presser foot may be incorrect.
- ★ Needle may be bent.
- ★ There may be a defect in the machine feed.
- ★ You may be pushing or pulling the fabric.

3. Puckers when stitched

- ★ Many fabrics pucker when stitched in a single layer.
- ★ The stitch length may not be in a correct relation to the fabric type.
- ★ If the fabric is sheer or light weight, the presser foot tension may need to be regulated.
- ★ Thread may be too thick.
- ★ Needle may be coarse.
- ★ Bobbin thread may be uneven.
- ★ Stitch tension may be unbalanced.
- ★ Feed dog may be worn out.

4. Shows feed mark on the underside

- ★ Presser foot pressure may be too heavy. You may need to put tissue paper between the fabric and the feed.
- ★ The feed may be damaged or set too high.



5. Fabric is damaged or holes around the stitches

- ★ Needle may be blunt or too coarse or wrong type for the fabric.
- ★ Check for the nick in the throat plate, foot or feed.

4.3.3 Machine

1. Motor does not run

- ★ Cord is not plugged in.
- ★ Power switch may be turned off.
- ★ Knee or foot accelerator may be jammed or improperly attached to power source.

2. Motor runs but handwheel does not turn

- ★ Thread or lint may be caught or tangled in the bobbin case area.

3. Motor runs, handwheel turns, but needle does not move

- ★ The needle may have been disengaged for bobbin winding and not tightened back to sewing position
- ★ If needle has been tightened but still does not move, the motor belt is slipping because it is loose or worn.

4. Motor, handwheel and needle moves but fabric does not feed

- ★ Make sure the presser foot is down
- ★ Check the stitch length regulator
- ★ The pressure regulator may be at the least/ light pressure. If fabric is heavy, more pressure may be necessary for fabric to feed.
- ★ The feed dog may be in the lowered or "down" position

5. Motor, handwheel, needle and fabric moves but no stitch is formed

- ★ Thread may have come out of the needle.
- ★ Needle may be threaded in the wrong direction.
- ★ Needle may be inserted backward or may not be pushed all the way up into the clamp.



- ★ Needle may be the wrong length for the machine.
- ★ Machine may be threaded incorrectly
- ★ Bobbin may be empty
- ★ Bobbin and / or case may be inserted incorrectly
- ★ The timing of the machine might be off

6. Machine runs sluggishly

- ★ Bobbin winder may still be engaged
- ★ Knee or foot control might be improperly positioned
- ★ Machine may be in need of oiling and / or cleaning

7. Machine runs noisily

- ★ Machine probably needs oiling and / or cleaning
- ★ The needle could be bent and hitting against foot or throat plate
- ★ Bobbin and / or case may not be tight enough
- ★ Bobbin may be almost out of thread.

8. Machine will not stitch in reverse

- ★ If machine is very old, it may not have this capability
- ★ If it is a recent model, check the stitch control. It may be set for "stretch stitch" or "buttonhole", sometimes these stitches cannot be reversed manually.

4.3.4 Needle

1. Unthreads

- ★ Insufficient thread may have been pulled through the needle before the seam was started
- ★ Machine may be out of top thread

2. Breaks

- ★ You may be using the incorrect presser foot



- ★ Presser foot and / or throat plate may be loose or improperly fastened.
- ★ Needle might have become bent and hit the presser foot and /or throat plate
- ★ Needle may be incorrectly inserted
- ★ Needle might be too fine for the fabric being sewed and for the job being done
- ★ You may have pulled too hard on fabric while stitching
- ★ Check machine settings.
- ★ Needle may be defective

4.3.5 Stitches

1. Are uneven lengths

- ★ You might be pushing or pulling the fabric too much
- ★ Pressure on the presser foot could be either too light or too heavy for the fabric
- ★ There could be lint or other clog between the teeth of the feed dog

2. Have loops between them

- ★ If the loops are large, the machine is improperly threaded
- ★ If loops are small tensions are unbalanced
- ★ Bobbin may be wound unevenly
- ★ There may not be enough pressure to hold the fabric taut during stitch formation

3. Skip here and there

- ★ Needle may be blunt or bent
- ★ Needle may be inserted backward or it might not be all the way up into the clamp
- ★ There may be insufficient pressure on the presser foot
- ★ Throat plate may be wrong for the purpose
- ★ You may be stitching at an uneven speed
- ★ While stitching, you may be pulling too hard on the fabric



4.3.6 Thread

1. Needle thread breaks

- ★ Usually this is caused by the needle being inserted backward or threaded backward
- ★ Thread may be caught in the spool notch or it could be wrapped around the spindle
- ★ There may be a rough or burred place on a thread guide
- ★ The needle may be blunt
- ★ Needle may not be all the way up into the clamp
- ★ Needle may be too fine for the thread, causing it to fray-often the case with silk buttonhole twist

2. Bobbin thread breaks

- ★ Bobbin case may not be threaded properly and /or the case not inserted properly
- ★ Bobbin may be too full
- ★ Check for dirt or clog in the bobbin case
- ★ Bobbin tension may be too tight

3. Bobbin thread cannot be raised through hole in throat plate

- ★ Bobbin case may be improperly threaded.
- ★ It may not have been properly inserted

ACTIVITY

Interview three people in your family/friends who use sewing machine and identify the common machine problems they face. List ways by which you can help them resolve those problems.

Fill in the blanks:

- a. Bobbin may wind unevenly if the _____ is not properly _____ in the thread guide.
- b. Stitches may skip here and there if the needle is _____ or _____.
- c. Needle may break if it is _____ incorrectly.



- d. Machine runs noisily if it probably needs _____ and / or _____.
- e. Motor does not run if _____ is not plugged in.

Review Questions

1. Explain why the bobbin winds unevenly.
2. What are the reasons for the machine needle to break?

4.4 OPERATING POWER MACHINES

The hands-on experience of working on a power machine is an essential and integrated part of this module. Each student should start with the first exercise as given below:

4.4.1 Activity 1

Objective: To familiarize with the machine

- ★ Sit and adjust yourself
- ★ Learn to operate treadle
- ★ Turn handwheel
- ★ Turn machine on

After familiarization with the machine, the students should practice the given exercises, first on paper, in order to achieve proficiency of the control of machine as explained below. They should then do all the exercises on single layer of muslin and later on double layer of muslin. Each sample should be of 10" X 10".

4.4.2 Activity 2

Objective: To stitch on paper

Practice on the paper the given exercise till you are able to control the machine by learning to control the treadle, brake and knee lift.

You must be in a position to stitch at an even speed whether stitching on fast or slow speed.

- a) **Stitch Parallel lines:** This will help you develop coordination, skill, accuracy and confidence.

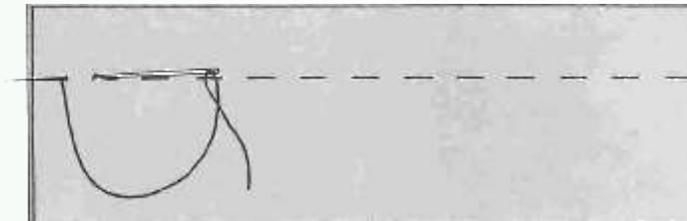


- b) **Stitching corners:** This is done by stopping the stitch with the needle down at the point of the corner and turning the fabric. This will enable you to turn corners precisely without dropping a stitch.
- c) **Stitching curved lines:** This will help you improve the control on the machine.

4.5 HAND STITCHES

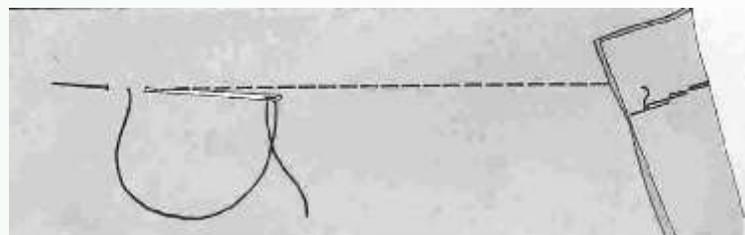
Before learning to make seams on the machine you must learn the basic hand stitches which are used in garment making. They will enable you to be proficient and neat in your work.

4.5.1 Backstitch



The backstitch is used to secure hand stitching, repairing and to sew lengths that are difficult to reach by machine. It is used for top stitching, hand picking zippers and under stitching. It is one of the strongest, elastic and versatile stitches used in hand sewing.

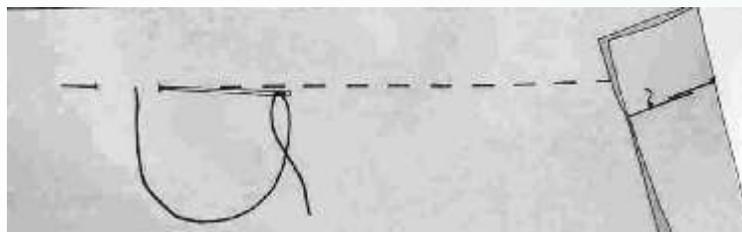
Even backstitch



Even backstitch is strongest, looks like machine stitching, even in length with very little space between them. Secure thread and pull needle out of fabric. Insert needle into fabric to right of the thread and pull out an equal distance to left of the thread. Repeat by taking just next to the previous stitch and continue.



Half backstitch



Half backstitch is not as strong as even backstitch. It is similar to the even backstitch but has some space between the stitches.

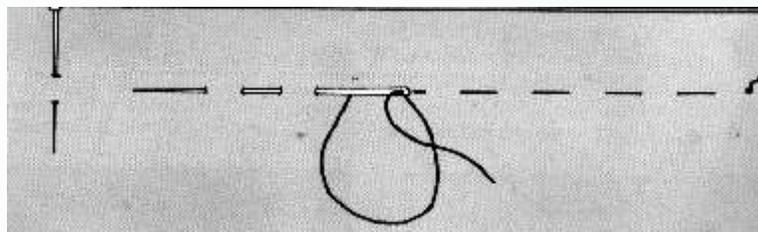
Work this stitch in the same way as even backstitch but take only a half stitch back and a whole stitch forward. This would create space between stitches.

Prick stitch



Prick stitch is almost an invisible stitch. It is decorative stitch, used to insert zippers in fine or sheer fabrics, and to sew layers of fabrics together where a row of machine stitching is not required. It is worked in the same way as half back stitch, with very short stitch on top with long spaces between them.

4.5.2 Basting



Hand basting is used to temporarily hold together two or more fabric layers during fitting and

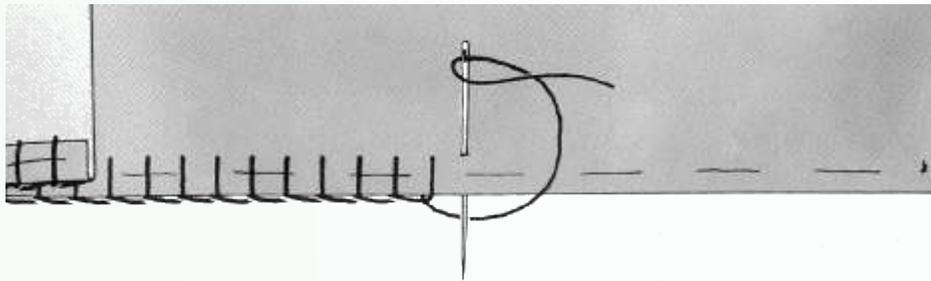


construction. Even basting is used to smooth the fabric in areas that require close control, such as curved seams, seams with ease and set in sleeves.

Uneven basting is used for general basting for edges that require less control during permanent stitching and for marking.

Method: Secure thread. Pick up short stitch, insert needle back into fabric same distance ahead. Repeat several times and pull the needle through.

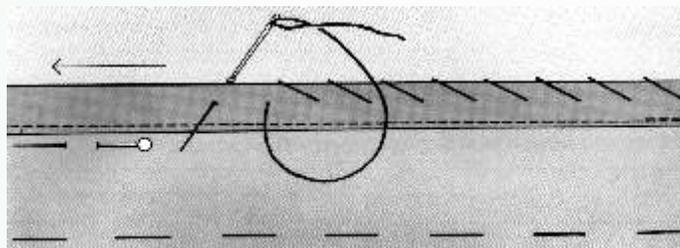
4.5.3 Blanket Stitch



Traditionally, an embroidery stitch, it was used to neaten the raw edges for preventing fabric from fraying. It is now used as a decorative stitch and also for applique work. It is also used to make button holes to secure hooks, eyes and snaps.

Method: Secure thread. Insert needle horizontally right to left required amount from fabric edge. Loop thread under needlepoint and pull thread through. Make next stitch parallel to it and keep repeating.

4.5.4 Hemming Stitch



This is used to secure a hem edge to a garment. These stitches pass over the hem edge to the garment.



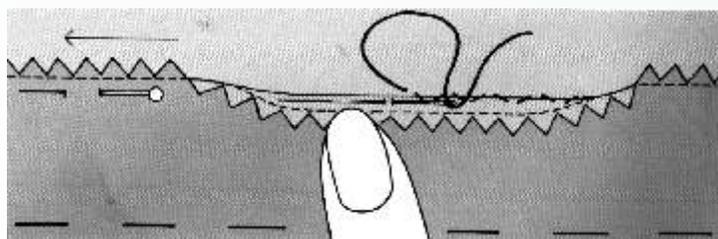
Slant hemming stitch: Quickest but least durable because much thread is exposed and subject to abrasion.

Method: Secure thread in hem. Pick up single thread on garment, bring the needle up through edge of the hem on the left side and diagonally up through the edge of the fold at the same time. Repeat.

Blind hem or tailor's hem: This is the most common hemming stitch. These stitches are taken inside between the hem and the garment. In the finished hem, no stitches are visible. It is quick and easy stitch that can be used on any blind hem.

Method: Secure thread in hem. Fold back the hem edge. Take a very small stitch to the left in the garment and then next stitch to the left in the hem. Continue alternative stitches from garment to hem, taking care to keep stitches very small on the garment.

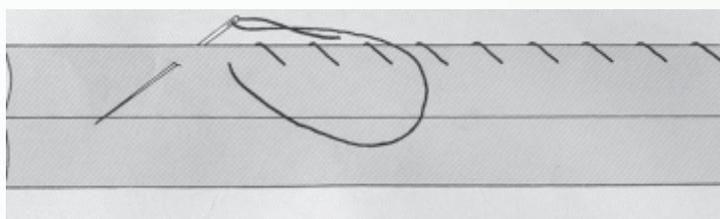
4.5.5 Catch Stitch



Catch stitch is a strong hemming stitch. Threads form a row of X's on upper layer with 2 parallel rows of dashes on back. Stitches are worked from left to right with needle pointing left.

Method: Secure thread in hem. Insert needle horizontally right to left to pick up short stitch on garment and pull thread through. Make next stitch to right and above the previous stitch. Make next stitch to right and in line with first stitch. The stitches should be alternated to make a series of X's.

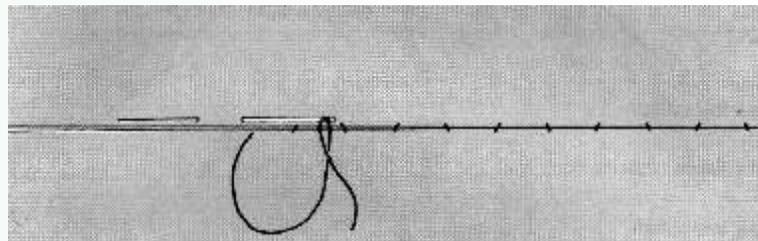
4.5.6 Overcast Stitch





This is the hand stitch for finishing the new edges of fabric to prevent them from raveling. Work from either direction, take diagonal stitches over the edge, spacing them at an even distance apart at a uniform depth.

4.5.7 Slip Stitch



This is a nearly an invisible stitch formed by slipping the thread under a fold of fabric. It can be used to join the folded edges or one folded edge to a flat surface.

Work from right to left. Fasten thread and bring a needle to thread out through one folded edge. For stitch slip needle through fold of opposite edge for about 1/4", bring needle out and draw the thread through.

4.5.8 Tacks

Stitches used to join areas that must be held together without a seam, or as reinforcement at points of strain.

Arrowhead

Arrowhead tack is a triangular reinforcement tack done from the right side at such points of strain as the ends of a pocket.

ACTIVITY

Make five samples of different hand stitches on muslin or poplin fabric.

Fill in the blanks:

- _____ stitch is traditionally used in embroidery.
- Hand _____ is used to temporarily hold together two or more fabric layers during fitting and construction.
- Slip stitch is an _____ stitch formed by slipping the thread under a fold of fabric.



4.6 SEAMS

Seams are result of joining together two or more pieces of fabric by means of stitching or fusing, but the basic function of a seam is to hold pieces of fabric together. To perform its function correctly the seam should have properties or characteristics closely allied to those of the fabric being sewn. The careful selection of the most appropriate seam, a suitable stitch type together with the correct thread and machine settings for the fabric and end product is therefore of paramount importance.

In addition to holding a garment together, seams can be used as a design element. Seams placed in unusual locations or top stitched with contrasting thread add interest to a garment. Whereas puckered, crooked or uneven seams spoil the fit as well as the look of the garment.

Most seams are constructed on inside or wrong side of the garment, but there are some seams which are constructed from right side of the garment.

A "seam line" is designated line along which the seam is to be joined.

A "seam allowance" is the distance from the fabric edge to the stitching line, farthest from the edge. Seam allowance is planned according to the width needed for the type of seam, seam finish or garment design.

There are only a few fundamental seams but by using a wide variety of finishes it is possible to adapt seams to materials of different weight and texture. The type of seam selected depends on:

- ★ The type of fabric i.e. the firmness, weight & texture of the fabric;
- ★ The use of garment;
- ★ Placement or position of seam on garment;
- ★ Care of the garment.

Most plain seams require a **seam finish** to prevent ravelling. A seam finish is a way of treating or enclosing the raw edges of seam allowance so they are more durable and do not ravel.

Variations of the plain seam include bound encased, top stitched and eased seams. Some, such as the flat fell seam, add strength or shape. Others such as French or bound seams, improve the appearance of the garment or make it longer wearing.



4.6.1 Plain Seam

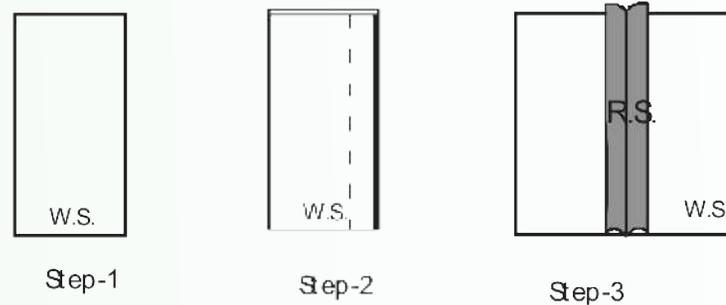
Of all the seams, a plain seam is the most basic and easiest to use. Its seam allowances are usually pressed open, although on lightweight fabric they can be trimmed and neatened together. In a well made plain seam, the stitching is exactly the same distance from seam edge till the entire length of the seam. To ensure absolutely straight seam, it is advisable to practise stitching while keeping the fabric edge aligned with seam guideline on the throat plate of needle, it is basically used on:

- ★ fabrics that will not ravel like fine to medium weight cottons, linens or fine wools.
- ★ On seams of garments that will be covered by a lining.

A Straight Seam

A straight seam is the one that occurs often in most cases, a plain straight stitch is used for stretchy fabrics. However a tiny zig-zag or special machine stretch stitch may be used instead of straight seam. It is rarely used for transparent fabrics such as voile, georgette, organdy etc. It is frequently chosen for side seams in blouses, kameez and frocks etc.

Straight Plain Seam



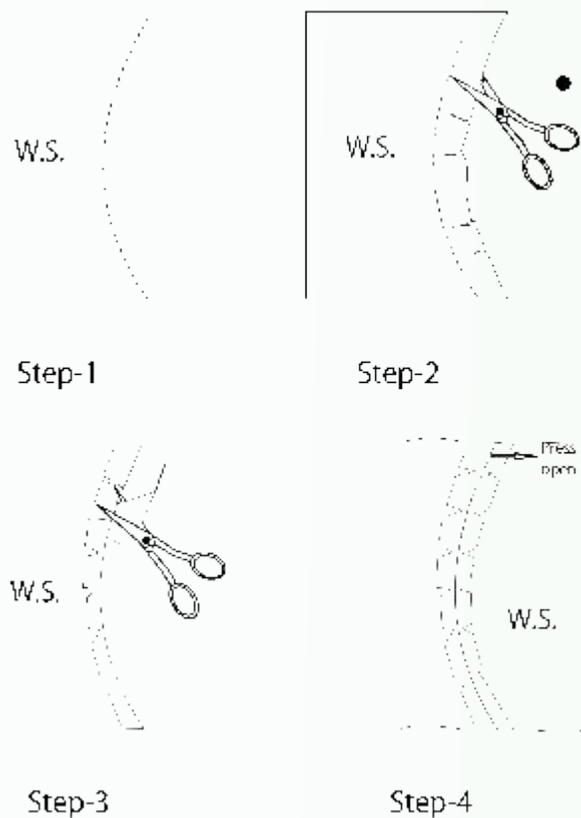
Steps of Construction

1. Lay two layers of material together, right side facing right side.
2. Machine stitch at edge leaving an allowance of 1". Start with backstitch and end with backstitch.
3. Press opens the seam, to avoid bulkiness and to make it smooth and flat.



4.6.2 Curved Seam

Curved Plain Seam



A curved seam requires careful guiding as it passes under the needles so that the entire seam line will be the same even distance from the edge. The separate seam guide will help greatly. To get better control, use a shorter stitch length (15 per stitch) and slower machine speed.

Steps of Construction

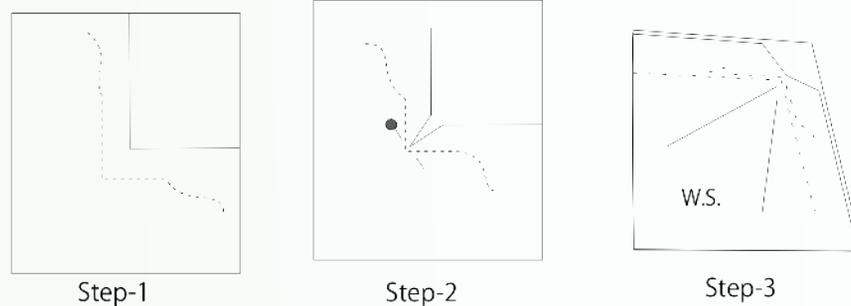
1. Stitch a line of reinforcement stitching just on seam line of the curve.
2. Clip into seam allowance all the way to the stitching line at intervals along the curve.
3. Cut out wedge-shaped notches in the Seam Allowance of outer curve by making small folds in Seam Allowance and cutting at slight angle. Be careful not to cut into stitching line.



4. Press seam open over the curve, using tip of iron only. Do not press into body of the garment. If not press to contour, seam lines become distorted and look pulled out of the shape.

4.6.3 Cornered Seam

Cornered Plain Seam



A cornered seam needs reinforcement at the angle to strengthen it. This is done by using small stitches (15 to 20 per inch) for 1" on either side of the corner. It is important to pivot with accuracy when cornered seams are enclosed, as in a collar where the corners should be blunted so that better point results are achieved when collar is turned.

Steps of Construction

1. To join an inward corner with an outward corner or straight edge, first reinforce the inward angle stitching just inside the seamline 1" on either side of corner.
2. Insert a pin diagonally across the point where stitching forms the angle clip exactly to this point, being careful not to cut past the stitches.
3. Spread the clipped section to fit the other edge; pin in position then with clipped side up, stitch on the seamline pivoting at the corner.

4.6.4 Seam Finishes

A seam finish is any technique used to make a seam edge look neater and or prevent it from ravelling out. Though not essential to completion of the garment, it can add measurably to its life. Less tangibly, finished seams add a professional touch, in which you can take pardonable pride.



Three considerations determine the seam finish decision.

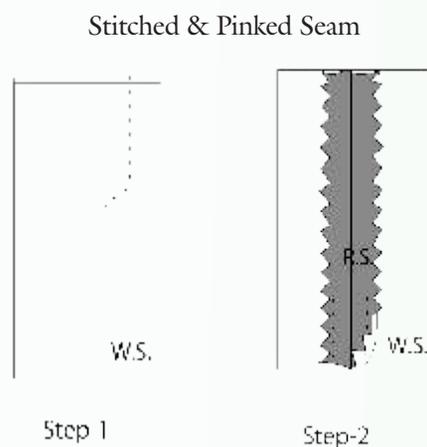
- 1) The type & weight of fabric. Does it ravel excessively, a little, or not at all?
- 2) The amount & kind of wear and care the garment will receive. If a garment is worn often then tossed into washer, the seams need a durable finish. On the other hand, if the style is a passing fad, or will be worn infrequently, you may select not to finish the seam edges.
- 3) Whether or not seams will be seen. An unlined jacket warrants the more elaborate bias binding finish. A lined garment requires no finishing at all, unless the fabric has a tendency to ravel a great deal.

Plain straight seams are finished after they have been pressed open. Plain, curved or cornered seams are seams finished right after stitching, next clipped or notched, then pressed open.

In this category we have the following seams:

- (i) Stitched & pinked seam
- (ii) Turned & stitched seam

4.6.4.1 Stitched & Pinked Seam



A seam finish in which a line of machine stitching is made $\frac{1}{4}$ " from the raw cut edge before pinking. It is done to prevent the pinked edge from ravelling, to prevent the seam from curling & on fabrics which ravel slightly.

It is a quick and easy finish suitable for firmly woven fabrics.

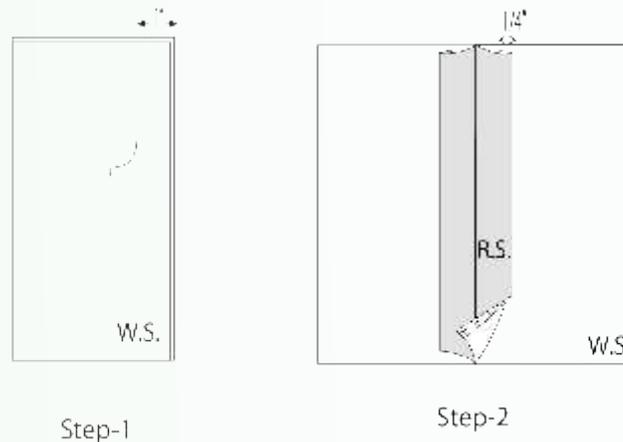


Steps of Construction

1. Take two layers of fabric, right side facing right side; stitch on wrong side, leaving a distance of 1" from edge. Press open the seam allowance. (straight plain seam)
2. Using a short stitch place a line of a stitching $\frac{1}{4}$ " away from the edge of the seam allowance on one side of seam allowance. Repeat the same on the other end of seam allowance.
3. Then pink the outer edge of the seam allowance away from the seam you have just applied.
4. Press open the seam.

4.6.4.2 Turned and Stitched Seam

Tailor Edge Seam



A seam finish, in which the raw edge of the seam allowance is turned under, stitched and concealed. Tailored edge, turned and stitched or clear finish all are the names of one seam. It may be helpful on difficult fabrics.

This is a neat tailored finish for light to medium weight fabrics of cotton, linen and viscose. It is done to

- ★ Prevent the seam edge from fraying
- ★ On straight edge seams.
- ★ On garments where seam allowance will not show on the face of the garment.



- ★ On plain weave fabrics.
- ★ On unlined coat, jacket or vests.

Steps of Construction

1. Take two layers of fabric, right side facing right side, stitch from wrong side at a distance of 1" from the edge. Press open the allowance. (straight plain seam)
2. Turn under the edge of the seam allowance $\frac{1}{4}$ " and stitch along the edge of the fold. Repeat the same step on the other edge of seam allowance.

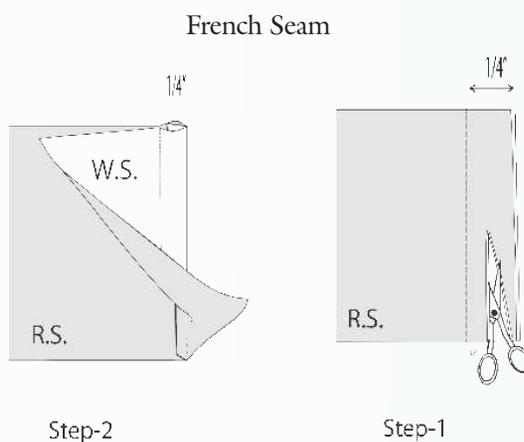
4.6.5 Self Enclosed Seams

Self-enclosed seams are those in which all seam allowances are contained within the finished seam, thus avoiding the necessity of a separate seam finish. They are especially appropriate for visible seams, especially with sheer fabrics & in unlined jackets. Also they are ideally suited to garments that will receive rugged wear or much laundering. Proper trimming and pressing are important steps if the resulting seams are to be sharp and flat rather than lumpy and uneven. Precise stitching is essential, too.

This category includes following seams:

- (i) The French seam
- (ii) Fat felled seam
- (iii) Mock French seam

4.6.5.1 French Seam





A seam constructed in a way so that a narrow seam is contained within a cage on producing a clear finish. This is a very secure and neat seam as the raw edges are not exposed. Since the finished seam consists of four layers of cloth, it is likely to be bulky. Hence it is suitable for thin/sheer fabric such as voile, organdy, georgette. It is also used for dainty garments and lingerie.

This is done to prevent fabrics from fraying.

- ★ Where the seam finish will show through garments made of sheer fabrics e.g. chiffon, organza, georgette, and organdy.
- ★ On children's & infants wear, underwear and outerwear.
- ★ On straight seams.
- ★ When a seam is to appear as a plain seam on the face of the garment and a clear finish is desired on the inside.

It is not used in couture industry but is suitable for garments that require frequent washing e.g. night wear.

This seam is also known as "lot pot silayee" and "gum silayee" in Hindi.

Steps of Construction

1. Lay two layers of material together, wrong side facing wrong side. The first stitch is 1/8" or 1/4" outside the fitting line, depending on the desired finished width of the seam. Trim the edge so that it is less than desired finished width of the seam. It looks best when finished width is 1/4" or less.
2. Press the seam in one direction. Turn the fabric so that right side is facing right side. Fold on the line of stitching. Machine stitch on the seam line. Since the raw edges are enclosed, this seam requires no special finish.

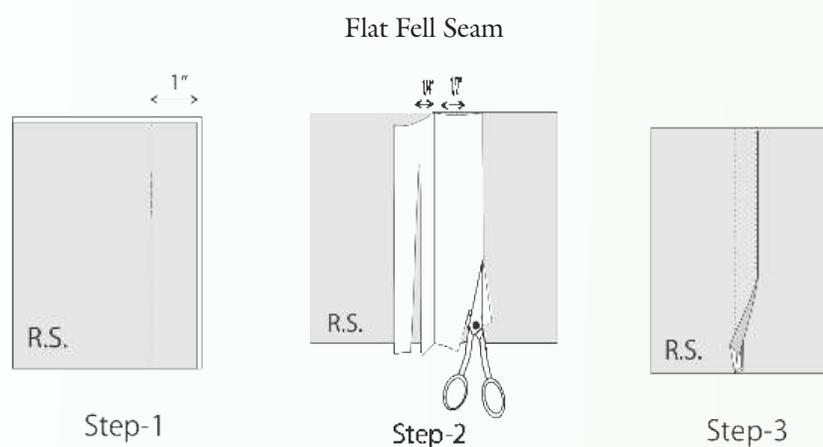
4.6.5.2 Flat Fell Seam

Place two layers of fabric with wrong side facing wrong side, stitch from right side leaving an allowance of 1" and press open the seam.

Trim inner seam allowance to 1/4". Press under the edge of the outer seam allowance which is trimmed to 1/2".



After pressing or folding outer seam allowance on inner one side, stitch this folded edge to the garment.



A flat felled seam is the result of enclosing both seam allowance by machining opposite folded edges beneath a row of machine stitches through all piles. The flat-felled seam is very sturdy and so often used for garment that are made to take hard wear e.g. sports clothing and children's wear. Since it is formed on the right side, it is also decorative and care must be taken to keep the widths uniform within a seam and from one seam to another. Be careful to press like seams in the same direction (e.g. both shoulder seams to the front). Other examples are men's shirts, boys trousers & women's tailored garment & unlined garments.

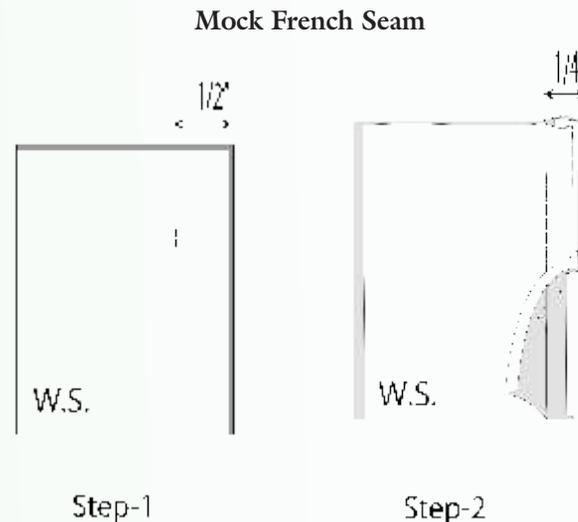
Flat felled seams may be produced in one operation with a felling foot attachment on an industrial machine. In non-industrial production, seam may be made in two or more steps.

Steps of Construction

1. Place two layers of fabric with the wrong side facing wrong side. Stitch from right side leaving an allowance of 1". Press open the seam (straight plain seam).
2. Trim the inner seam allowance to $\frac{1}{4}$ ". Press under the edge of the outer seam allowance which is trimmed to $\frac{1}{2}$ ".
3. After pressing or folding outer seam allowance on inner one, stitch this folded edge to the garment.



4.6.5.3 Mock French Seam



A plain seam made to resemble a French seam by the face-to-face enclosing of the folded seam edges. The mock French seam which is also known as False French or Imitation French seam can be used in place of the French seam, especially on curves of armholes and princess line garments, where a French seam is difficult to execute on transparent fabrics that ravel easily and where a strong finish is required. Basically used for fabrics where two turnings are difficult to make, as in matching plaids.

Steps of Construction

1. Take two layers of fabric, right side facing right side, stitch at a distance of $\frac{1}{2}$ " from the edge on wrong side.
2. Turn in the seam edges $\frac{1}{4}$ " and press, matching folds along the edge. Stitch these folded edges together. Press seam to one side.

4.6.6 Top Stitching Seams

Seams are top stitched from the right side with usually one or more seam allowances caught into the stitching. Top stitching is an excellent way to emphasize a construction detail, to hold seam allowances flat or to add interest to plain fabric.

There are two main considerations when top stitching. The first is that normal stitching guides will not, as a rule, be visible, so new ones have to be established. A row of hand basting or tape applied



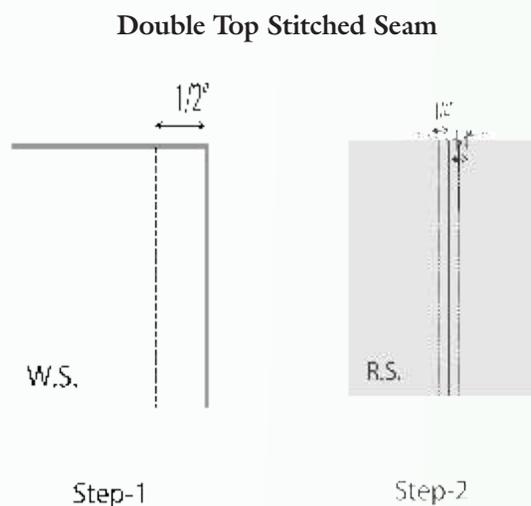
just next to the top stitching line can help. The presser foot is also a handy gauge.

The other consideration with top stitching is how to keep the under layers flat and secure even basting will hold pressed open seam allowances. Diagonal basting will hold those that are enclosed or pressed to one side. Grading and reducing seam bulk will contribute to smooth topside.

A long stitch is best when top stitching used buttonhole twist or single or double strands of regular thread. Adjust needle and tension accordingly.

- 1) Double top stitched seam
- 2) Mock flat seam

4.6.7 Double Top Stitched Seam



A seam which has been pressed open and stitched parallel to and on both sides of the seam line, through garment and seam plies.

This is an excellent seam to emphasize a construction detail as decorative stitching to hold seam allowance flat and to add interest to plain fabric and also to strengthen seams.

Steps of Construction

1. Take two layers of fabric, right side facing right side, stitch at a distance of 1" from the edge on wrong side. (straight plain seam)



1. Eased seam
2. Gathered seam

4.6.10 Eased Seam

An eased seam entails the drawing in or easing of a longer section of a seam line on one ply to fit a corresponding but shorter section of a seam line in the second ply.

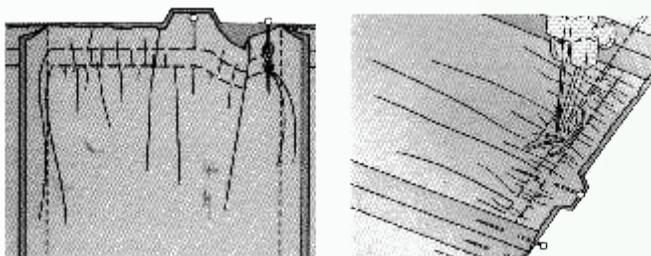
This seam is used to replace small darts in necklines, elbows, buntlines and waistlines, on the back sleeve seam at the elbow, on outward curved seam of the side front panel in princess line garment, on waistlines of skirts and bodice to distribute fullness and control fit and to match back shoulder to front.

Steps of Construction

1. Machine is run on the bigger side of the fabric piece without any thread in the needle. At the same time finger is kept behind (intact to) presser foot so that bigger material gets (kind of) gathers.
2. This piece is place on shorter piece, stretched to the required length and stitch in place.

[Note: - This method or seam is possible only when bigger piece is $\frac{1}{2}$ " to 1" bigger otherwise other method has to be used to control ease]

4.6.11 Gathered Seam



A gathered seam requires control stitching and retains more fullness. Gathering is the process of drawing fullness into a much smaller area by means of two rows of machine basting. This seam is possible when one fabric piece is much longer than the other one. Gather with two stitching lines on the longer piece of fabric, the stitching lines are then pulled at each end to draw up the fabric. Finally, the gathered piece is sewn to a shorter length of fabric.



The stitch length for gathering is longer than for ordinary sewing. Use a stitch length of 6 to 8 stitches per inch for medium weight fabrics. For soft or sheer fabrics, use 8 to 10 stitches per inch. A long stitch makes it easier to draw up the fabric but a shorter stitch gives more control when adjusting gathers.

Before you stitch loosen the upper thread tension. The bobbin stitching is pulled to draw up the gathers and a looser tension makes this easier.

If the fabric is heavy or stiff, use heavy-duty thread in the bobbin. A contrasting color in the bobbin also helps distinguish it from upper thread.

Steps of Construction

1. Take the bigger fabric piece and from the right side stitch (8 to 10 per inch) one basting line just next the seam.
2. Stitch another line (on the same single piece of fabric) $\frac{1}{4}$ " away in the seam allowance.
3. Pin seam edges together at matching points, such as notches.

Draw up bobbin threads, distributing fullness evenly and wind drawn threads around a pin to secure gathers.

Pin baste and stitch seam with gathered side up.

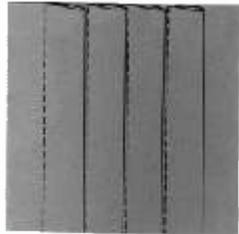
4.6.12 Pleats



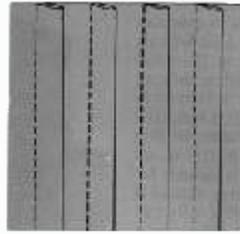
Pleats are made by folding the fabric in various ways. Pleating may occur as a single pleat, as a cluster or around an entire garment section. **Side pleats** are all turned in the same direction. Side pleats are also called Knife pleats. **Box pleats** have the two folds turned away from each other. **Inverted pleats**, which have an underlay, have the two folds meeting at the common placement line.



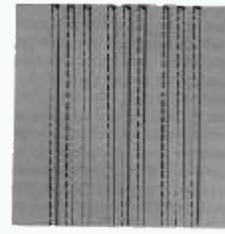
4.6.13 Tucks



Blind Tucks



Spaced Tucks



Pin Tucks

Tucks are parallel folds of fabric used for a decorative effect on the right side of the fabric. The spacing can vary from the very narrow pin tucks to deeper, spaced tucks.

For perfection in stitching tucks, the markings must be exact. Tucks that are very narrow are called **Pin Tucks**. The pin tuck is an edge stitch evenly spaced 1/16" from the fold.

Tucks that are wider than pin tucks but are close to each other and meet at the stitch line are called **Blind Tucks**.

For wider or more widely spaced tucks, increase the amount of fabric in each fold or the space between the tucks. The tucks that have space between them are called **Spaced Tucks**.

ACTIVITY

Visit garment retail shops. Identify and list the 3 most commonly used seams each in menswear, womens wear and Kids wear garments.

Fill in the blanks:

- Tucks are _____ of fabric used for a decorative effect on the right side of the fabric.
- Three types of pleats are _____, _____ and _____.
- _____ is the process of drawing fullness into a much smaller area by means of two rows of machine basting.
- _____ seam is suitable for thin/sheer fabric such as voile, organdy, georgette.



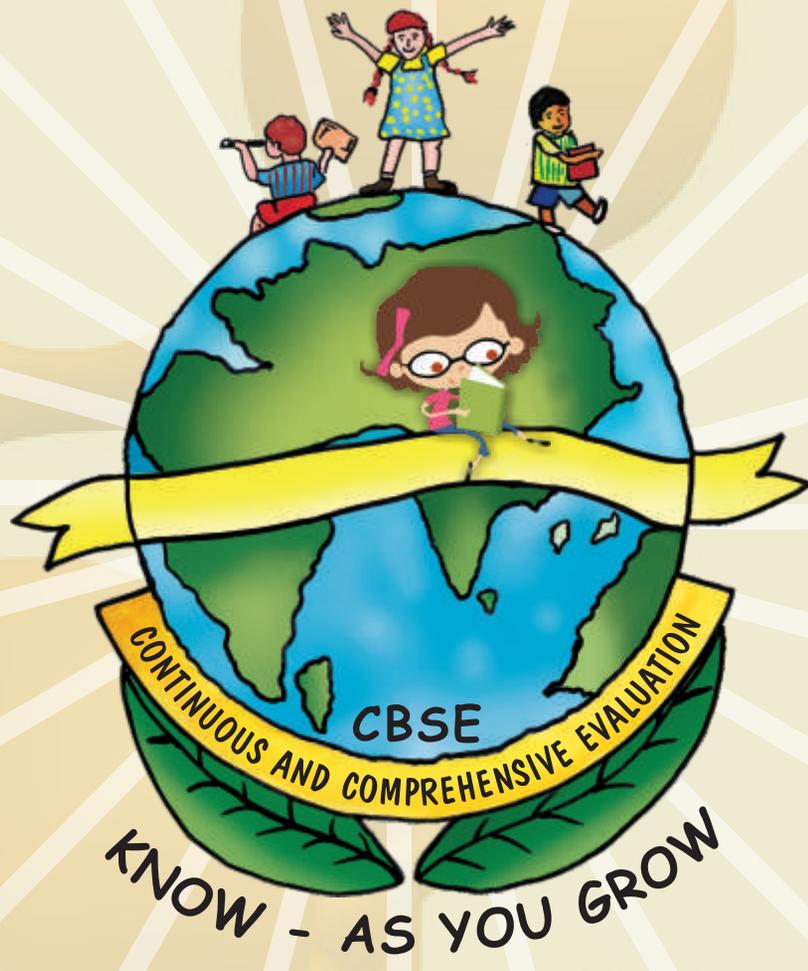
Fashion Studies

04

- e. A _____ is the distance from the fabric edge to the stitching line, farthest from the edge.
- f. _____ seams are those in which all seam allowances are contained within the finished seam, thus avoiding the necessity of a separate seam finish.

Review Questions

1. Identify key factors that determine seam selection in a garment
2. What is Seam Finish?





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