

CBSE SCIENCE EXHIBITION 2015 – 16

Detail of Sub-Themes for preparation of Exhibits and Models

A few exemplar ideas pertaining to the sub-themes listed in the context of the theme for the development of exhibits are given below.

THEME: SCIENCE AND MATHEMATICS FOR INCLUSIVE DEVELOPMENT.

1. Health, Nutrition and Cleanliness

The main objectives of this sub-theme are: to bring awareness among the children about the factors affecting our health and nutrition needs of the body; to explore new scientific, technological and bio-medical inventions in prevention and cure; to analyse the role of self and society in order to maintain good health, meet nutritional needs of the body and promote innovative ideas for better management.

The exhibits/models in this subtheme may pertain to:

- various levels of good health and ill health;
- factors affecting the health and resulting ailments in the body;
- infectious and non-infectious diseases, relationship with causative factors and their sources;
- innovative preventive measures to control diseases at different levels/ roles of various agencies;
- Demonstration and use of traditional methods of medication;
- Demonstration of known facts and findings, and health benefits of Yoga;
- Role of biotechnology improved crops and nutrition;
- Demonstration of models/ projects to create awareness among children about rules of safety in appropriate hazardous situation to avoid accidents and injuries;
- Demonstration of models/ projects to show the effect of junk food items, adulterated food items on our body and its preventive measures;
- Model to demonstrate importance of balanced diet and nutritional values of various food items;
- Cope up with life style related diseases
- presenting medical assistance and facilities of rural/urban and gender aspects;
- ways to raise awareness and sensitise people to be careful in health matters, explore the possibilities and make use of the facilities available;
- Innovative ideas for effective implementation of policies/ programmes/ schemes such as Swachh Bharat Abhiyan, National Leprosy Eradication Programme etc that have significant impact on health.
- development of knowledge-base and understand new scientific, technological aids in bio-medical areas;
- presentation of known facts and research findings in different medical systems like Traditional, Modern, Homeopathy, Ayurvedic etc.;
- lifestyle and its relationship with good and bad health based on known facts and researches;

- mechanism/ways to control the spread of epidemics such as Dengue, Malaria etc.
- demonstration of the role of traditional knowledge of herbal products for community health; etc.
- improved methods of sanitation and appropriate technology for waste disposal, both biodegradable and non-biodegradable;
- common prophylactic measures available and advantages of inoculation and vaccination;
- need for appropriate measures for family planning and welfare;
- ideas for developing low-cost nutritious food;
- Low cost medical diagnostic and therapeutic tools;

2. Resource Management

This area is expected to make children think of various ways and means for making efficient use of available resources and also new techniques/methods of conservation and management of resources.

The exhibits/models in this subtheme may pertain to:

- plans for proper management of resources and its monitoring;
- restoration of degraded areas and habitat of natural biodiversity;
- ecological studies of plants and animals;
- efficient methods of harvesting and preserving marine resources;
- Schemes/designs to help reduce production cost and conservation of various raw materials;
- sustainable land use practices/ecologically sustainable farming methods;
- recycling of water, materials, solid wastes, etc;
- devices/methods that control air/water/land pollution and technologies to manage them;
- stopping depletion of essential micro nutrients in the soil;
- forest, river, mangroove, wet land conservation and management;
- desilting and renovation of ponds, tanks and reservoir;
- self regulating water harvesting system/rainwater harvesting and storage in a manner that evaporation and transportation losses are minimised;
- participatory watershed development and management;
- development of low cost technology for producing potable water;
- sea water use along the coastal area for raising mangrove and salicomia plantation together with agriculture;
- innovative/improvised designs for reducing waste in extraction and processing of minerals;
- innovative methods of exploration and preserving minerals and crude oil, etc;
- cost effective heating and cooling system of buildings, etc.;
- models to control loss of natural resources due to mismanagement/ disasters, etc.

3. Industry

The objective of this sub-theme is to help children understand the importance of science and mathematics in various types of industries and try to think of ways and means to increase its efficiency leading to

production of different kinds of goods to meet the future needs of the growing population at affordable price.

The exhibits and models in this area may pertain to:

- models showcasing improved versions of various types of machines and manufacturing plants;
- schemes/designs to help reduce production cost and conservation of raw materials;
- use of eco-friendly innovations that may help in increasing the industrial production;
- innovative methods of exploration and processing of minerals, crude oil etc.;
- roles and possibilities of the service industries like tourism, banking, IT etc. for inclusive development;
- devices or methods that measure and control pollution;
- devices/methods to minimise the effects of chemical spills, solid waste, nuclear waste and radiations etc from industries/nuclear plants etc;
- awareness about various aspects of environment and disposal of harmful effluents, solid waste, nuclear waste etc;
- design and development of automatic devices for various applications in industries;
- ozone destruction experiments etc.;
- use of innovations/improvements that may help in increasing production in various industries, such as textiles, engineering goods, machine tools, chemicals, drugs and pharmaceuticals including lifesaving drugs, vaccines and devices and eco-friendly plastics etc. to improve the quality of life;
- improved/ indigenous design/working models of devices which may be used on small scale for production/manufacturing of utility items of daily life;
- indigenous/ innovative techniques for exploration/ conservation/ recycling/ processing of minerals and other natural resources;
- improved/improvised/innovative technologies associated with weaving, pottery, metal work, dyeing, printing and other crafts practiced in cottage industry and suggestions for new designs;
- working models to demonstrate equipment/processes/devices/ technologies/ designs, which may help facilitate the domestic work

4. Agriculture and Food Safety

The main objectives of this sub-theme are:-to make children and teachers aware of various techniques/methods to enhance agriculture production to achieve food security; to make children and teachers think of various ways and means to enhance knowledge on Agriculture and food safety.

The exhibits/models in this sub-theme may pertain to:

- effect of climatic change on agriculture and its mitigation and adaptive techniques/methods;
- preservative and conservative methods for soil degradation and judicious use of water;
- conventional biotechnology practices e.g., application of biotechnology, microbiology and genetic engineering to agriculture for improved yield.
- organic farming/organic fertilisers versus chemical fertilisers;

- planning and managing energy crops (Salix, poplar, Jatropha, Jojoba etc.);
- use of biotechnology for economically and ecologically sustainable biofuels;
- various pest control and management measures;
- application of biotechnology and genetic engineering in improving animal breeds and production of animal products that are used as food;
- innovative/inexpensive/improved/ indigenous technologies/ methods of storage/preservation/conservation/ transport of agricultural products and food materials;
- innovative/improved practices for reducing cost of cultivation;
- identification of medicinal plants and their applications;
- effect of electric and magnetic fields on the growth of plants and protective measures;
- indigenous designs of farm machinery, agriculture implements and practices;
- impact of pollution on food and food safety;
- improved/improvised method of processing, preservation, storage and transport of food products;
- Identification of medicinal plants and their applications;
- Issues related with the animal health and food security;
- Measures/methods for ensuring food safety;
- Food production and demand of quality food and food security;
- Advantages and disadvantages of genetically modified (GM) food;
- Nutrition education/healthy eating habits and food utilisation by body;
- Devices to control noise, air, soil, water pollution;
- Study and record varying water levels, over the year, in the water body, surrounding environment;
- Design and development of an automatic weather recording device;

5. Disaster Management

The main objective of this sub-theme is to make general public and children aware about the issues and concerns of disaster management and to promote a shift in disaster management system from relief centric to preparedness centric.

The exhibits/models in this subtheme may pertain to:

- better information dissemination and public address system in the event of disaster to prevent chaos and confusion;
- mechanism for creating awareness among general publics on large scale to handle situations during disasters;
- extending logistic supports during various calamities, undertaking rescue and rehabilitation measures during calamities;
- improvised/improved devices for effective communication between various emergency services-medical, police, military and other administrative bodies/committees;
- various measure/ models for planning, preparedness and coordination of different agencies in the event of disaster/community level preparedness for the various man-made disasters such as gas leakage, nuclear accidents, battery/bomb explosions, stamped situation etc.;

- use of geostationary satellites in providing information pertaining to meteorological processes;
- technologies in forecasting and warning of cyclones, floods and storms;
- innovative design of flood alarm/ flood forecasting and cyclone warning network;
- information management from ships and oceans buoys - use of radars in cyclone detection;
- various flood preventing measures such as construction of raised platforms, embankment of rivers, maintenance of mangroves and other mitigation measure;
- to ensure the effectiveness drainage system for clearance of sewage before monsoon season/to carry off storm water;

6. Mathematics for a quality life

The main aim of this sub-theme is to make our school children and teachers aware and realize about various mathematical ideas and tools to solve problems confronting the society and thereby leading to a quality life.

The exhibits/models in this subtheme may pertain to;

- policies, programmes and schemes in mathematics that have a significant impact on human life;
- mathematical applications that have a wide ranging impact on issues such as agriculture, energy, health, space, energy, health, environment, space, industry, communication, education, etc.;
- effective and efficient ways of communicating an experiment that revolutionize mathematical ideas;
- cost effective demonstration of known facts and research in mathematics;
- impact of mathematical ideas on other subject areas such as science, medicine, psychology, social science etc;
- contribution of mathematics for economic growth, mass literacy, eradication of poverty and malnutrition, etc.
- mathematical ideas to solve various problems of our everyday life/ environment related problems;
- mathematical models to predict orbital path of comets, meteors and other minor planets;
- mathematical models to show how disease might spread in human in the event of epidemics/bioterrorism;
- mathematical models to predict the devastating effects of wars/nuclear explosions;
- mathematical models to show spread of forest fire depending on the types of tree, weather and nature of the ground surface;
- mathematical models to demonstrate the action of medicines in human system;
- mathematical tools of the working of heart, brain, lungs, kidneys, bones and endocrine system;
- using mathematical tools and computer simulation to improve cancer therapy/wound healing/tissues formation/corneal wound healing;
- mathematical tools to describe traffic flow/stock market option;
- mathematical tools to show the effect of climate change/global warming;
- mathematical tools for predicting future population and knowing the impact of population;