



CENTRAL BOARD OF SECONDARY EDUCATION
SHIKSHA SADAN, 17-ROUSE AVENUE, INSTITUTIONAL AREA, NEW DELHI-110002

CBSE/Sc.Exh/Cons/2012

25.04.2012

**All Head of Institutions
Affiliated to the Board**

Circular No. Acad-5/2012

Subject: Organisation of CBSE Science Exhibition-2012

Dear Principal

The Central Board of Secondary Education has been taking many initiatives to provide interactive, participatory, hands-on, innovative and creative learning experiences to students studying in its affiliated schools. One such initiative refers to the organisation of Science Exhibitions at Regional and National levels every year. The activity aims at providing a common platform to schools, teachers and students to give shape to their innovative ideas and learn from each other's experiences. These exhibitions also intend to provide a medium for popularising Science and increase awareness among the stakeholders about close relationship between Science, Technology and Society. The main objectives of organising Science exhibitions can be summarised as:

- promoting interest in Science and Technology among younger generation.
- encouraging scientific and technological creativity among students and inculcating a sense of pride in their talent.
- providing exploratory experiences, encouraging creative thinking and promoting psychomotor skills among school students through self designed models or simple apparatus.
- encouraging problem solving approach and developing appropriate technologies, especially for rural areas and integrating scientific ideas with daily life situations.
- popularising Science and technology among masses and creating an awareness regarding its impact on socio-economic and sustainable development of the country.

Taking into consideration the enthusiastic response from participating schools in the past, it has again been decided to organise Science exhibitions for the year 2012. These exhibitions are likely to be organised in different parts of the country at Regional level in the month of July/August and at National Level in the month of September/October, 2012.

The main theme and sub-themes for this year's exhibition are:

Main Theme : Science , Society and Environment

Sub-themes: The six sub-themes are:

- **Agriculture and Food Security**
- **Energy-Resources and Conservation**
- **Health**
- **Environmental Issues and Concerns**
- **Mathematics and Everyday life**
- **Disaster Management**

Key aspects of the exhibition

The following key aspects of the exhibition may be kept in mind for participation:

- (i) The participating school/team will have to bear all expenses related to participation in the event.
- (ii) The participating school can put up a maximum of two exhibits/projects/models
- (iii) A school team may be represented by a maximum of two students per exhibit and one escort Science Teacher.
- (iv) The participating teams will have to make their own lodging/boarding arrangements at the venue city of exhibition
- (v) The request for participation alongwith the enclosed registration form and fee is to be sent directly to the **Respective Regional Officer and not to Headquarters Delhi.**
- (vi) The schools in Delhi region may send it to the Regional officer, Central Board of Secondary Education, PS-1-2, Institutional Area, I.P. Extension, Patparganj, Delhi-110 092
- (vii) The exhibit/model may be either
 - (a) A working model
 - (b) An investigation-based project
- (viii) The exhibit/project may include
 - working model to explain a concept, principle or a process
 - an indigenous design of a machine/device
 - an innovative/inexpensive design or technique
 - application of basic principles of Science/Technology
 - Scheme/design of a device or machine to reduce production cost
 - Investigation based study
- (ix) Every participating school will pay a participation fee of Rs.400/- in the form of a demand draft **in favour of Regional Officer, CBSE** payable at respective regional office city.
- (x) The last date for registration for participation in the **event is June 15, 2012.**
- (xi) The first stage of exhibition will be held at two/three different venues in every region.
- (xii) The selected **best fifteen** exhibits/ schools at every regional level venue will be **eligible to participate** in the **National level exhibition.**
- (xiii) The exhibits/projects will be **assessed** by the experts as per the following **criteria:**

• Students' own creativity and imagination	20%
• Originality and innovativeness in design of the exhibit/project	15%
• Scientific thought/principle	15%
• Technical skill/workmanship/craftsmanship	15%
• Utility/educational value	15%
• Economic aspect, portability, durability	10%
• Presentation -Explanation and demonstration	10%
- (xiv) The actual dates for the regional level exhibition will be communicated through the Regional officers to every school as well as through CBSE website www.cbse.nic.in by July 15,2012.
- (xv) Greater emphasis may be given to investigation-based innovative projects to kindle scientific method and scientific approach in the students.

- (xvi) A brief write-up about the main-theme and sub-themes is enclosed for reference. The participating teams may prepare the exhibits/projects on any one of the sub-themes satisfying one or more of the stated parameters.
- (xvii) Attractive awards/cash prizes are given to exhibits/students who present the best twenty models at the national level.

The above information may be brought to the notice of all concerned, particularly the science faculty in the school and the students. The request for participation alongwith the enclosed registration form, registration fee and other details may be sent to **respective Regional Officer** before due date. For any other information in this regard, you may contact the **Consultant at science.cbse@gmail.com**

You may also send any specific suggestions or observations in this regard to the undersigned at the above e-mail address.

Thanking you,

Yours faithfully



(R.P. Sharma)
Consultant

Copy to below mentioned respective Heads of Directorates/KVS/NVS/CTSA with a request to disseminate the information to all concerned schools under their jurisdiction:

1. The Commissioner, Kendriya Vidyalaya Sangathan, 18-Institutional Area, Shaheed Jeet Singh Marg, New Delhi-110 016.
2. The Commissioner, Navodaya Vidyalaya Samiti, A-28, Kailash Colony, New Delhi.
3. The Director of Education, Directorate of Education, Govt. of NCT of Delhi, Old Secretariat, Delhi-110 054.
4. The Director of Public Instructions (Schools), Union Territory Secretariat, Sector 9, Chandigarh-160 017.
5. The Director of Education, Govt. of Sikkim, Gangtok, Sikkim – 737 101.
6. The Director of School Education, Govt. of Arunachal Pradesh, Itanagar-791 111
7. The Director of Education, Govt. of A&N Islands, Port Blair-744 101.
8. The Secretary, Central Tibetan School Administration, ESS ESS Plaza, Community Centre, Sector 3, Rohini, Delhi-110 085.
9. All the Regional Officers of CBSE with the request to send this circular to all the Heads of the affiliated schools of the Board in their respective regions.
10. The Education Officers/AEOs of the Academic Branch, CBSE.
11. The Joint Secretary (IT) with the request to put this circular on the CBSE website.
12. The Library and Information Officer, CBSE
13. EO to Chairman, CBSE
14. PA to Controller of Examinations, CBSE, Delhi
15. PA to Secretary, CBSE
16. PA to Director (Training) CBSE
17. PA to Director (Acad.) CBSE
18. PA to Director (Spl. Exams.), CBSE, Delhi
19. PRO, CBSE



(R.P. Sharma)
Consultant

CBSE SCIENCE EXHIBITION 2012

Guidelines for preparation of Exhibits and Models

Given below are number of ideas for designing the exhibits on different sub-themes in the context of the main theme. However, these ideas are only suggestive in nature. Participants are free to design exhibits based on other related ideas on the given sub-theme.

Sub Theme-1 **Agriculture and Food Security**

Agriculture, directly or indirectly, has been the main source of livelihood for majority of Indian population. One of the greatest assets in rural areas could be an intelligent and effective use of emerging technologies such as biotechnology, microbiology, genetic engineering, etc. The agricultural activities that lead to food production are no longer a subject of classical farming only. The modern agriculture cannot sustain itself without the support of research work done by scientists. With the help of science and technology, we can enhance our agricultural knowledge to achieve food security to reduce hunger, malnutrition and poverty, and facilitate equitable, environmentally, socially and economically sustainable development.

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

- Studies of climatic change on agriculture
- Managing crop yield due to climatic change arising from global warming
- Preservation and conservation of soil and judicious use of water
- Conventional biotechnology practices e.g., application of biotechnology, microbiology, genetic engineering and genomics to agriculture for improved and high yielding varieties
- Organic farming/organic fertilisers versus chemical fertilisers; biodynamic liquid manure/green manure
- Use of biotechnology for economically and ecologically sustainable biofuels
- Environmental friendly measures of pest control
- 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
- Organic fertilizers versus chemical fertilizers
- Food production and demand of quality food and food security
- Nutrition education/healthy eating habits and food utilisation by body

Sub Theme-2 **Energy- Resources and Conservation**

After food and water; energy is our most basic need. All activities require energy to perform. Energy is an important concern that differentiates the global rich and the global poor. All conventional sources of energy are exhaustible. At the current rate of consumption, known reserves of petroleum will be exhausted in about 35 years, natural gases in about 50 years and coal sometime within 200 years. The great concern about energy is not about diminishing supplies. It is rather than our current models of harnessing energy that are unsustainable because of environmental, economic, geographical and equity issues. One of the important and obvious way of redesigning system for harnessing energy is to develop and shift to clean and nonconventional

energy resources which are either non exhaustible or renewable as solar energy, wind energy, hydroelectric power, geo-thermal energy, energy from biomass and biogas, ocean thermal energy, wave energy and energy from other emerging technologies.

This sub-theme is expected to make the children think of various ways and means for making efficient use of available energy resources and also new techniques/methods of using and conserving energy from both conventional and nonconventional sources.

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

- Models of green building/environment building which harvest energy, water and materials
- Green roof technologies/roof mounted solar technologies such as solar water heater, solar lighting system
- Models/innovative designs of domestic hydroelectric generator
- Solar cooker/solar distiller/solar dryer for food processing/solar heated houses
- Studies of variation in sunshine intensity at a given place for developing indigenous method of its usage etc
- Projects for measuring availability of solar/wind energy in a given area
- Use of tidal waves/ocean currents/salinity gradient for generating electricity
- Energy from biomass such as seaweeds, human/animal wastes, keeping in view environmental concerns
- Improvised technologies for effective usage of bio-fuels
- Innovative designs of bio gas/bio mass plant
- Bio diesel from plant oils (obtained from canola, palm oil, micro algae oil, waste, vegetable oil etc)
- Low cost liquid fuel (bio-ethanol, bio methanol from cellulose biomass by improvising conversion techniques)
- Innovative designs of internal combustion engine which can function on various bio fuels
- Production of electrical energy from mechanical energy/nuclear resources

Sub theme-3

Health

Our health is continuously under the influence of both endogenous (within) and exogenous (around) environment and therefore a matter of great concern especially in the rapidly growing society to cope up with newer scientific and technological inventions. Our health is adversely affected due to many environmental hazards that lead to several kinds of infections in the body. With increasing population, demand for food, water, home, transport, energy etc are increasing causing tremendous pressure on our natural resources and thereby contributing to pollution of air, water and soil. The lifestyle including food and water we take, tendency for junk/ fast food, rest and exercise, habits and drugs and alcohol abuse is another challenge to our health.

The present sub-theme is proposed with the objectives: to bring awareness among the youth about health and factors affecting our health, to explore new scientific, technological and biomedical interventions in prevention and cure, to analyze the role of self and society in keeping our environment healthy in order to maintain good health and promote innovative ideas for better management.

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

- Demonstration of health and differentiation from the state of ill health
- Sensitising people to be careful in health matters, explore the possibilities and make use of the facilities available

- Development of knowledge-base and understand new scientific, technological aids in bio-medical area
- Demonstration of known facts and research findings in different medical systems like Indian, Modern, Homeopath etc.
- Demonstration of lifestyle and relationship with good and bad health based on known facts and researches
- Need for appropriate measures for family welfare
- Need for developing low-cost nutritious food
- General awareness about occupational hazards and innovative techniques to overcome them
- General awareness about community medicine
- Simple technologies for developing diagnostics and environmental monitoring.

Sub theme-4

Environmental Issues and Concerns

The spectacular industrial and economical development over the past few decades has led to the replacement of the communities of nature by man-made communities. Deforestation, overgrazing, indiscriminate mining, and tree-felling, faulty tillage practices etc. have led to severe soil erosion. Over irrigation and river-harvesting of agricultural lands has resulted into salinity of water, water logging and degradation. Over-use of tube wells has substantially lowered down the underground water table. Major current environmental issues include climate change, species extinction, pollution, environmental degradation, and resource depletion etc.

For humans to live sustainably, the Earth's resources must be used at a rate at which they can be replenished. The main objective of this sub-theme is to make general public and children in particular aware with the current environmental issues and concerns for achieving sustainability to prevent the effect of environmental issues.

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

- Environmental issues related with human activities such as agriculture, energy, fishing, forests, mining, shipping, paper, war, ocean deoxygenation, dead zone, paint etc.;
- Environmental issues with energy conservation, renewable energy, efficient energy use, renewable energy commercialization etc;
- Environmental controversies such as dam controversies, genetically modified organisms/food controversy, sealing, dioxin controversy, water fluoridation controversy etc.;
- Environmental disasters such as Bhopal disaster, oil spills, nuclear accidents etc.
- Climate change — global warming, greenhouse gases, fossil fuels, sea level rise, ocean acidification etc.;
- Issues related with environmental health such as air quality, asthma, electromagnetic radiations and fields, lead poisoning, indoor air quality, sick building syndrome etc;
- Water pollution — acid rain, marine pollution, Ocean dumping, eutrophication, marine debris, thermal pollution, algal boom, micro-plastics, etc;
- Air pollution — smog, ozone, particulate matter, sulphur oxide etc;
- Soil erosion, soil contamination and salination and Waste;

Sub-theme-5

Mathematics and Everyday life

The important segment of mathematics-- the ability to reason and think clearly, is extremely useful in our everyday life. Proofs and deductions are hallmarks of mathematics. The subject also deals with data, measurements and observations from science, mathematical models of natural phenomenon including human behaviour and social systems. Its domain is not molecules or cells but numbers, chance, forms, pattern and order, algorithms and change. As a science of abstract objects, mathematics relies on logic rather than on observation.

Mathematics gives an exactness in thinking and provides a quantitative approach. The special role of mathematics in education is a consequence of its universal applicability. In general, to solve practical problems we follow a set procedure involving steps related with defining variables; writing equations or inequalities; collecting data and organize into tables; making graphs and illustrations; and calculating probabilities.

To encourage and stimulate students' interest in Mathematics, some of the mathematical principles being transacted at school stages with their applications have been indicated below.

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

- Principles of sequence and series in several spheres of human activities viz, calculating the amount of money over certain period of time under given rate of simple interest or compound interest/ finding depreciated or increased value of a certain commodity over a period of time
- Determining expenditures needed for manufacturing water tank / rectangular box/cylindrical/cone- shaped objects of a certain material provided cost of material per square/cube/unit are known;
- Determining perimeter, area of a region bounded by polygons/the circumference and area of a circular region/surface area and volume of cube/cuboid/cylinder/ cone/sphere/hemisphere of solid when two basic solids are joined together;
- Finding the ratio of area of quantities of substances in the formation of compounds or mixtures;
- Designs of parking area for maximum utilization of space;
- Predicting the population of species over certain period of time under given constraints;
- Applications of linear programming in solving problems pertaining to manufacturing of goods/transport/diet issues
- Applications of mathematics in decorating home e.g. how many rolls of wallpaper/number of tiles are needed to cover the wall;\
- Using mathematics in cooking and nutrition/estimating number of calories and quantity of nutrients (carbohydrates, proteins, fats, minerals etc.) in a sampleportion of various food items;
- Establishing a mathematical relation by considering all possible parameters to have maximum profit in producing certain items by a factory;

Subtheme-6

Disaster Management

Disasters have significant relationship with natural resource management, poverty alleviation and sustainable development. Various disasters can cause damage to human life, environment, infrastructure, lowering the quality of life, loss of different bio organisms, political instability and conflicts, demographic imbalance, unemployment etc.

There is chaos and disorganisation in the event of any natural or manmade disaster. The objective of this sub-theme is to increase awareness of the dangers posed by disasters and to help children find measures for effective mitigation of those dangers.

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

- Better information and public address systems in the event of disaster to prevent chaos and confusion;
- Access of clean and safe drinking water in the event of disaster;
- Improvised/improved devices for effective communication between various emergency services-medical, police, military and other administrative bodies/committees;
- Various measures/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, etc.;
- Use of geo-stationary satellites in providing information pertaining to meteorological processes;
- Technologies in forecasting and warning of cyclones, floods and storms;
- Innovative designs of flood alarm/flood forecasting and cyclone warning networks;
- Information management and early warning systems for flash floods;
- Studies of the impact of global warming on human health (spread of epidemic like dengue, malaria, yellow fever etc.);
- Designs and development of automatic weather recording devices etc.

CBSE REGIONAL LEVEL SCIENCE EXHIBITION, 2012
REGISTRATION FORM

1. Name of the School -----
2. Complete address (including state)with Tel.no./ Fax/ e-mail -----

3. Region -----
4. Title of the Exhibits/ Projects -----

5. Sub-theme of the exhibit (see enclosed information) (i) -----
(ii) (If applicable)-----
6. Details of registration fee/ draft
Draft Number and dated -----
Amount and Bank -----
7. Brief write up of the Exhibit/ Project including
 - (a) Scientific Principle
 - (b) Method/ Procedure followed
 - (c) Unique features of the exhibit
 - (d) Applications in different domains of life
 - (e) Further scope of the exhibit/ project

(The complete write-up of the exhibit not to exceed 200 words)

8. Name of the participant students
 - a. -----
 - b. -----

9. Name of the escort teacher (with mobile no.)-----

Principal's Signature _____

Full Name-----
Mobile Number _____