



CBSE/ACAD/AD (ART&I)/2017

22<sup>nd</sup> August, 2017  
Circular No.: Acad.- 34/2017

**All Heads of Independent Schools affiliated to CBSE**

**SUBJECT: CBSE SCIENCE EXHIBITION - 2017-18**

The Central Board of Secondary Education (CBSE) 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 is the organization of Science Exhibition 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. The exhibitions also provide a medium for popularizing Science and increasing awareness among stakeholders about the close relationship between Science, Technology and Society.

The Science exhibition for the academic 2017-18 is likely to be organized in different parts of the country at **REGIONAL LEVEL** in the month of **November/ December in 2017**. **The NATIONAL LEVEL will be conducted after the completion of the Regional Level and dates for the same will be notified later.**

**Theme and sub – themes for the Science Exhibition for 2017 - 18**

THEME	SUB-THEMES
Innovations for sustainable development	<ol style="list-style-type: none"><li>1. Health and well-being</li><li>2. Resource management and food security</li><li>3. Waste management and water body conservation</li><li>4. Transport and Communication</li><li>5. Digital and Technological solutions</li><li>6. Mathematical modeling</li></ol>

**NOTE:**

- The students may prepare an exhibit/model on any sub-theme other than the above listed six sub-themes but it should be in the context of the main theme of the exhibition as mentioned above. Some ideas that are new and may be applicable in future may also be presented in the form of presentations and discussions.
- Any exhibit/model/idea developed by differently abled students should be displayed only by the differently abled student/s. The entries should be accompanied with a disability certificate issued from a competent



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authority. Disability norms followed by the Government of India will be considered under this category.

**GUIDELINES FOR PARTICIPATION -**

1. All schools willing to participate need to apply **on-line** before the closing date.
2. The last date for filling the on-line registration form is **30<sup>th</sup> September, 2017**.
3. The **registration fee of ₹ 650/-** must be submitted through **NEFT** to the account of the Board as given below.

Name of the A/C holder	Secretary, CBSE
Account No.	24172010004103
Name of the Bank & Branch	Syndicate Bank, Extn. Counter, CBSE, Rouse Avenue, New Delhi – 110002
IFSC Code	SYNB0002417

The Unique Transaction Reference Number after submitting fee through NEFT, must be mentioned in the online registration form.

4. It should be ensured that the names of the students once registered online should not be changed at any stage of the exhibition.
5. **The complete application including typed brief write-up (not more than 1000 words) for each exhibit and printed copy of the online registration form duly signed and forwarded by the Principal** is to be sent to the following address super scribed '**SCIENCE EXHIBITION 2017-18**' by **05<sup>TH</sup> OCTOBER, 2017**.

**SMT. ARCHANA THAKUR**  
**DEPUTY DIRECTOR**  
**CENTRAL BOARD OF SECONDARY EDUCATION**  
**"SHIKSHA SADAN", 17, ROUSE AVENUE**  
**NEW DELHI – 110002.**

6. A participating school can put up a maximum of two exhibits/projects/models.
7. A school team will be represented by a maximum of two students per exhibit and one escort Science Teacher.
8. Students studying in **classes VI to XI in the current academic year i.e. 2017-18** are **eligible** to participate.
9. School team participating at Regional Level and National Level must remain the same.
10. The sub – theme once selected cannot be changed.
11. The exhibit/model 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

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- Application of basic principles of Science/Technology
  - Scheme/design of a device or machine to reduce production cost
  - Investigation based study
  - New and innovative ideas to the form of presentations
12. Care should be taken that eco- friendly materials are preferably used in the preparation of exhibits.
13. A few exemplar ideas pertaining to the sub – themes listed in the context of the theme for the development of exhibits are enclosed as Annexure – I.
14. A brief write-up (not more than 1000 words) as mentioned under point no. 5 given above should be submitted as per the given proforma enclosed at Annexure – II.
15. The exhibits will be **assessed** by the experts as per the following **criteria**:
- |  |     |
|--|-----|
| a. Students' own creativity and imagination  | 20% |
| b. Originality and scientific and mathematical innovations in the exhibit/model            | 15% |
| c. Scientific thought/principle/approach   | 15% |
| d. Technical skill, workmanship, craftsmanship etc.  | 15% |
| e. Utility for society, scalability/educational value                                      | 15% |
| f. Economic (low cost), portability, durability, scope of its applicability in future etc. | 10% |
| g. Presentation – aspects like demonstration, explanation and display                      | 10% |
16. The participating school/team will have to bear **all expenses** related to participation in the event.
17. The participating teams will have to make their own **lodging/boarding arrangements** at the venue city of exhibition.

### Key points related to the conduct of exhibition

1. The first stage of exhibition will be held at different venues in every region. The information regarding the venues will be circulated / notified later on.
2. The selected best eighteen exhibits (the numbers may increase or decrease depending on the quality of the exhibit) at each regional level venue will be eligible to participate in the National level exhibition.
3. The actual dates for the regional level will be communicated to every school and details will also be available on CBSE website [www.cbseacademic.in](http://www.cbseacademic.in).
4. Schools are advised to follow CBSE's guidelines available on CBSE website.
5. Certificates will be awarded to the best entries selected at the National Level.
6. The names of the winners of the National Level Science Exhibition will be forwarded to NCERT for their consideration for participation in 45<sup>th</sup> Jawaharlal Nehru National Science Mathematics and Environmental Exhibition for Children in



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2018 to be organised by NCERT. The confirmation for the participation in the aforementioned exhibition is subjected to their selection for the same.

For any other information in this regard, you may contact at **Tel. No.-011-23230328** or email at [sciexhb2017@gmail.com](mailto:sciexhb2017@gmail.com) with a copy to undersigned.

Yours sincerely,

(Dr. Biswajit Saha)  
Additional Director (ART&I)

**Copy to the respective Heads of Directorates, Organizations and Institutions as indicated below with a request to disseminate the information to all the schools under their jurisdiction:**

1. The Commissioner, Kendriya Vidyalaya Sangathan, 18-Institutional Area, Shaheed Jeet Singh Marg, New Delhi-16
2. The Commissioner, Navodaya Vidyalaya Samiti, B-15, Sector-62, Institutional Area, Noida-201309
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 –737101
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 – 744101
8. The Director of Education, S.I.E., CBSE Cell, VIP Road, Junglee Ghat, P.O. 744103, A&N Island
9. The Director, Central Tibetan School Administration, ESSESS Plaza, Community Centre, Sector 3, Rohini
10. The Additional Director General of Army Education, A-Wing, Sena Bhawan, DHQ, PO, New Delhi-1
11. The Secretary AWES, Integrated Headquarters of MoD (Army), FDRC Building No. 202, Shankar Vihar (Near APS), Delhi Cantt-110010
12. The Under Secretary (EE-1), MHRD, Govt. of India, Department of SE&L, Shastri Bhawan, New Delhi-01
13. All Regional Directors/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
14. All Additional Directors /Joint Directors/Deputy Directors/Assistant Directors, CBSE
15. In charge IT Unit with the request to put this circular on the CBSE Academic website
16. The Deputy Director & Assistant Librarian, CBSE
17. The Public Relations Officer, CBSE
18. EO to Chairman, CBSE
19. SPS to Secretary, CBSE
20. SPS to Controller of Examinations, CBSE
21. SPS to Director (Information Technology), CBSE
22. SPS to Director (Special Exams and CTET), CBSE

**Additional Director (ART&I)**

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“Shiksha Sadan”, 17, Rouse Avenue, New Delhi – 110 002

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**THEME: INNOVATIONS FOR SUSTAINABLE DEVELOPMENT.**

**1. Health and well being**

The main objectives of this sub-theme are: to bring awareness among the children about the factors affecting our health and nutritional needs of the body; to explore new scientific, technological and bio-medical inventions in prevention and cure of diseases; to explore various scientific and technological interventions for meeting nutritional requirement of human beings and innovative ideas for better management. The exhibits/models in this sub-theme may pertain to:

- 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 physical exercise and Yoga;
- model to demonstrate importance of balanced diet and nutritional values of various food items;
- role of biotechnology to improve nutritional value of crops
- demonstration of models/ projects to show the effect of junk food items, adulterated food items on our body and its preventive measures;
- demonstration of models/ projects to create awareness among children about appropriate rules of safety in hazardous situations to avoid accidents and injuries;
- presenting medical assistance and facilities for rural/urban areas 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 understanding 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;

- mechanisms/ways to control the spread of epidemics such as Dengue, Malaria etc.
- improved methods of sanitation and appropriate technology for waste disposal, both biodegradable and non-biodegradable;
- common prophylactic measures available for different diseases and advantages of inoculation and vaccination;
- appropriate measures for family planning and welfare;
- ideas for developing low-cost nutritious food;
- low cost medical diagnostic and therapeutic tools;
- models for sustainable agriculture and health;
- models to demonstrate the impact of chemical residues from fertilizers, pesticides, hormones and food dyes etc., on health;

## **2. Resource management and food security**

This sub-theme 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. Also sub-theme is expected 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.

- Ideas for developing low-cost nutritious food; and
- plans for proper management of resources and its monitoring;
- 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, mangrove, wetland 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;
- development of low cost technology for producing potable water;
- 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.
- effect of climatic change on agriculture and its mitigation and adaptive techniques/methods;

- preservative and conservative methods for prevention of soil degradation and judicious use of water;
- organic farming/organic fertilisers versus chemical fertilisers;
- planning and managing energy crops (Salix, Poplar, Jatropha, Jajoba, etc.);
- use of biotechnology for economically and ecologically sustainable biofuels;
- various pest control and management measures;
- innovative/inexpensive/improved/ indigenous technologies/methods of storage/preservation/conservation/ transport of agricultural products and foods materials;
- innovative/improved practices for reducing cost of cultivation;
- 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;
- issues related with the animal health and food security;
- measures/methods for ensuring food safety;
- advantages and disadvantages of genetically modified (GM) food;

### **3. Waste Management and Water Body Conservation**

In the modern world the life style and development activities generates lot of biodegradable and non-biodegradable waste which are affecting water bodies as well. Both surface and groundwater is facing huge quantity and quality threat in the present time. Water bodies form a very important source of water and also helps in recharging groundwater. Lakes, ponds, tanks etc. which are built to hold water need to be protected. Keeping in view the need of the hour, it is of utmost importance to stimulate children by involving them in bringing out some solutions for managing the waste and conservation of water bodies. The exhibit/models in this area may pertain to;

- various way of waste disposal such as landfill, incineration, etc.;
- new technique/methods for waste disposal;
- cost effective and environmental friendly waste management;
- various ways/methods/techniques of recycling waste materials;
- various ways/methods/techniques of extracting useful resources from waste materials;
- low cost waste management system;
- improvised/ improved devices for effective and efficient waste management system;
- issues involved I nuclear, biological, medical and chemical waste management;
- issues related to management of marine pollution, ocean dumping, eutrophication, marine debris, thermal pollution, algal boom, micro-plastic, etc.;

- implication of nano – technology (nano – toxicology and nano – pollution);
- improvised and innovative techniques/methods of harnessing energy from waste material.
- technique of separating/extracting harmful biological/chemical/nuclear waste and their storage;
- technique and processes for reducing waste generation;
- efficient and effective methods/ technique of waste handling and transportation;
- traditional practices to be adapted for conservation of water;
- new technique/methods/practices for conservation of water bodies;
- cost effective and environmental friendly water bodies management;
- techniques/ways to create awareness for conservation of water;
- improvised/ improved devices for effective and efficient water management system;
- surveys/studies on the initiatives taken in the country in this direction.

#### **4. Transport and Communication**

The objectives of this sub–theme are:–

to make general public and children understand different modes of transport and communication as well as the importance of transport and communication for Sustainable development; to make them aware about the issues and concerns of the present transport and communication systems and to promote innovations for efficient systems. The exhibits/models in this sub–theme may pertain to:

- improvised/indigenous models for efficient transport and communication;
- working models of fuel efficient/ pollution–free designs of automobiles /ships, boats etc.;
- innovative ideas for efficient management of road, rail, water and air transport systems, e.g. better safety measures, managing traffic jams, etc;
- demonstrating the principle and functioning of modern devices of communication systems;
- demonstrating the use of information technology in sharing improved designs/indigenous designs/devices;
- developing innovative designs/ models of equipments for the children with special needs;
- improvised/improved devices for effective transport and communication between various emergency services, namely medical, police, military and other administrative bodies/committees;
- use of geo–stationary satellites in providing information pertaining to vehicular movements and transportation, disaster management, etc;
- designs for improving existing transport and communication systems;



- innovative ways of using modern communication technologies for connecting people;

## **5. Digital and Technological Solution**

Digital technologies have impacted almost every walk of our life. Be it education, research, business & commerce, communication, safety & security, medicine or even socialization, countless observation of the shift to digitalization are seen. Digital technologies have made life much easier, by speeding up the pace and scale of doing such things. Through automation, it has saved time and human labour, and at the same time, it has created many job opportunities. Under this sub theme, the participants are expected to come out with fresh ideas about solving daily-life problems with the help of digital technologies or proposing a tentative solution to critical issues that can be better addressed or managed digitally or with the help of and other technology. Technological solution can be a simple mobile application or a prototype of a software-based solution or a strong enough idea with a detailed solution plan. It is considered that digital technologies can help us achieve the sustainable development plan. Therefore, children are encouraged to critically think about applications of sustainable digital and technological solutions of various important challenges faced by the human society. The exhibits and models in this area may pertain to :

- Use of digital technology for improving quality of education.
- maintenance of learning performances over years and their analysis for career guidance and counseling.
- use of digital technology for prevention as well as mitigation of large scale disease out breaks, lifestyle related illness, etc.
- technology for effective monitoring and implementation of Swachh Bharat Schemes, as well as other cleanliness & hygiene efforts.
- safeguard against cyber attacks and online privacy.
- mass awareness for reach & access of initiatives through Digital India Scheme & Other benefits. Use of technology to make easier digital transactions by less educated persons.
- technology for effective and efficient ways of communicating scientific and mathematical ideas and concepts.
- technology for better information and public address systems in the event of disaster to prevent chaos and confusion;
- applications of technology as an educational tool; simulations in science, mathematics, etc.;
- other emerging areas in information and communication technology.

## 6. Mathematical modeling

Mathematical model is a representation in mathematical terms of the behavior of real devices and objects. The main aim of the sub–theme ‘mathematical modeling’ is to make our school children aware about how the problems and the situations around them could be framed in a mathematical setting and can be solved using the ideas and principles of mathematics. This will also make them realize the role of mathematics in understanding nature and natural phenomenon and help in finding solutions for societal challenges. The exhibits/models in this sub–theme may pertain to:

- mathematical applications that have a wide ranging impact on issues such as agriculture, 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 depending on the types of tree, weather and nature of the ground surface;
- 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 for predicting future population and knowing the impact of population.
- mathematical tools to describe effect of climate change/global warming.

**Proforma for write up  
Science Exhibition 2017 – 18**

<b>Affiliation No.:</b>	
<b>Name of the School &amp; Address:</b>	
<b>Name of the Exhibit &amp; Sub-theme:</b>	
<b>Introduction</b>	
(i) Purpose	
(ii) The Scientific principle involved	
<b>Description</b>	
(i) Material/s used	
(ii) Construction and working	
(iii) Application if applicable	
<b>References (if any)</b>	
<b>Illustrations</b>	
(i) Black and white line and labelled diagram of the model. Illustrating the working of the exhibit/model	
(ii) Close – up photograph of exhibit/model	

**A write up may be prepared considering the above said fields (whichever is applicable) as per requirement.**