National Council of Science Museums

- Advancing Non-formal Science Education

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Director General

National Council of Science Museums

National Council of Science Museums

*** The largest formal network of Science Museums & Centers in the world!**

*** Creator of 48 Science Museums / Centers / Science Cities & 2 Centers outside India so far. 21 more centres under implementation**

*** Annual Visitors footfall - 13.74+ million** (3.5 MILLION SCHOOL STUDENTS)

*** Extensi[illegible] -for rural schools a[illegible]**

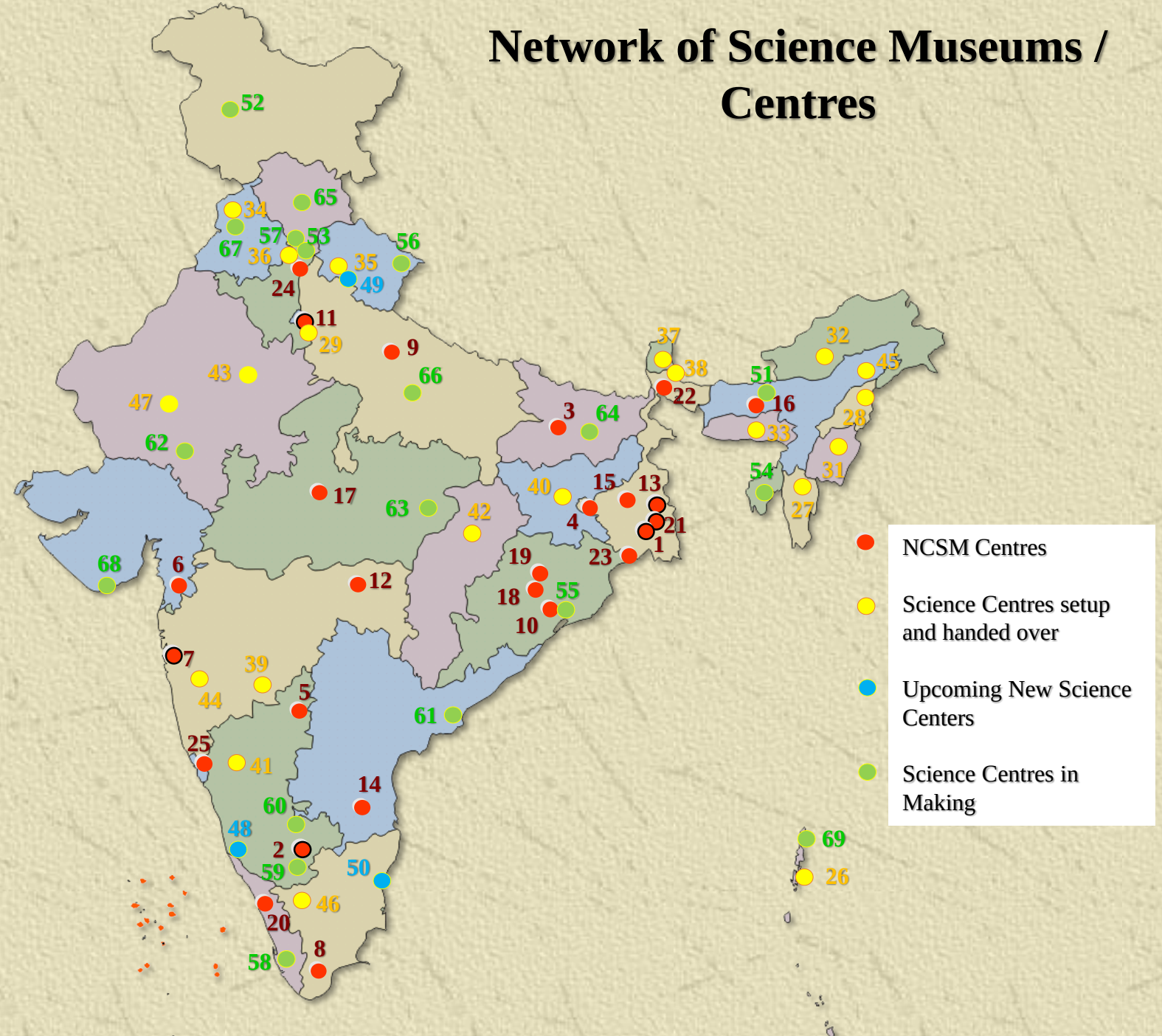
Major Objectives of NCSM

- To portray the growth of science and technology and their application in industry and human welfare, with a view to develop scientific attitude and temper.
- To popularise science and technology.
- To supplement science education given in schools and colleges to foster a spirit of scientific enquiry and Creativity among the students.
- To conduct research in science and technology in the areas pertaining to the activities of the Council and to evaluate traditional science and technology in the light of modern scientific and technical concepts.
- To establish Centres for development of science exhibits and demonstration aids.
- To render assistance to universities, technical institutions, museums, schools and colleges or other bodies in planning and organising science museums and also in training of personnel for museum profession.
- To collect, restore and preserve important historical objects which represent landmarks in the development of science, technology and industry.
- To portray the Science & Technology heritage and the cultural interface of Science & Technology in India.

Major Activities of NCSM

- Taking Science to people and making people for Science
- Developing Human Resource for Science Communication
- Portraying Growth and National Heritage in S&T
- Supplementing school science education through non-formal mode
- Engaging public and students in S&T through interactive activities
- Development of Science Museums / Centres / Cities in India/abroad
- Creating R&D infrastructure for exhibit, interactive technology and learning resource material development
- Managing 25 Science Museums / Centres & Providing Catalytic support to other science centres/museums
- Developing Travelling Exhibitions on contemporary & topical issues in S&T and Mobile Science Exhibitions for rural areas

Network of Science Museums / Centres



Supplementing School Science Education through non-formal mode

NCSM has special focus on providing hands-on and minds-on experiences through its various engaging activities for young school students in order to develop their interest in STM and motivate them to take science, mathematics and technology (SMT) as career as well as acquire scientific temper.

Moto - Attract, Excite, Engage, Motivate and Stimulate Interest

Method - Keep it Simple and Make it Fun (KISMIF)

Non-Formal Science Education Programmes

1. *National Science Seminar*
2. *National Science Drama*
3. *Engineering Fair*
4. *Innovation Fair/Festival*
5. *Science Demonstration*
6. *Vacation Hobby Camp*
7. *Innovation Hub*
8. *Innovation Club*
9. *Science Model Making Workshop*
10. *Astronomy Olympiad*
11. *Robot Olympiad*
12. *Open Lab on Cutting Edge Technology*
13. *Sc. Teacher professional development Program*
14. *Interactive Exhibits and Exhibitions*
15. *Mobile Science Exhibition for rural students*
16. *Sky Observation, Planetarium and Taramandal Shows*
17. *School Science Festivals*
18. *Science Expo*
19. *Popular science lectures by eminent scientists/engineers*

National Science Seminar

National Science Seminar is conducted in NCSM every year to bring out the creative talent amongst the students(8^{th} – 10^{th}). The topics of science seminar are selected in such a way that it should promote creative thinking among the participants. The students are selected through contests at district level, state level and then at national level and present their views like a scientist. About 20000 students participate every year.

National Science Drama Festival

The aim of this programme is to encourage students to explore and experiment with the dramatic form as a means of science communication. The topics most are related to ‘Science & Society’ which are well researched by students for their script. . Science Drama Competition held at each science centre, zonal and national levels, is thus an excellent platform for showcasing juvenile artistic creativity and scientific talent.

Engineering Fair

Engineering Fairs are arranged at all the units of NCSM every year to showcase the creative/research based ideas of students. This event draws huge number of student participation at all the units of NCSM to showcase their talent. Students present their creative ideas into a model and exhibit in Science Fairs. Polytechnic and Engineering students also exhibit their projects/models. Eminent scientists and innovators/ technocrats are invited to give inspiring lectures to the students and engaging exposure sessions are also arranged during such fairs

Innovation Fair

Innovation Festival / Fair is meant to provide a platform for different sections of creative minded people, innovators and students to showcase their innovations from the fields of science, engineering, art, technical craft, music, pottery etc. Do-it yourself, Make & Take, and Challenges Corner sections of Innovation Festival / Fair engage and facilitate people and students to think creatively.

Science Demonstration Lectures

Excite and make to understand the concepts

Vacation Science Camps

All science museums and centres organize science camps during vacations.

Focus of these camps is hands-on experience and discovery.

Innovation Hub

Undertaking innovative experiments, projects and problem solving exercises in multi-disciplinary set up brings joy to learning. The enjoyment factor involved in such engagement enhances young student's motivation and interest levels in science, mathematics and technology. With those objectives, the Govt. of India through the Ministry of Culture, has made the NCSM as a nodal agency through to develop 60 innovation hubs in the country during 12^{th} five year plan. This is achieved through a process called Scheme for Promoting Innovation, Creativity and Engagement in Science (SPICES).

Facilities in Innovation Hubs

- Hall of Fame- Celebrating Inventions, Inventors & Innovators
- Innovation Resource Centre
- Idea Lab (Innovation Laboratory)
- Thod Phod Jod (Break & Remake) Corner
- Kabad Se Jugad (Build from scrap)
- Idea Box
- Design Studio

- Provision for Innovation Club/discovery room in member schools (10 per Innovation Hub)

Facilities in Innovation Hub

Hall of Fame

Innovation Resource Centre

Innovation Laboratory

At present 7 such hubs have been set up and by this year end 20 more such hubs will be set up and 54 by 2017.

Innovation Hub

Mentors facilitate discovery and innovation by students

Science Model Making Workshop

Junior Astronomy Olympiad

Nationwide identification of students interested in astronomy and facilitating their participation in National Junior Astronomy Olympiad and there after in International Astronomy Olympiad

Robot Olympiad

Nationwide identification of students interested in Robotics and facilitating their participation in National Robotics Olympiad and there after in World Robotic Olympiad

Recent Event: **World Robot Olympiad on 'Robot Explorers'**

(i) **One Gold and One Silver medals in Regular Elementary category**

(ii) **One Silver and 8th position in Open Junior High Category**

Open Labs in Cutting Edge Technology

Students in NANOLAB, Science City, Kolkata

* Maths Lab in BITM, Kolkata
•Bio-tech lab in VITM & BITM
•Robotics Lab in NSCD

Teachers Training Program

Teachers Training Program

Teacher Training Programmes on Computer Aided Learning

Interactive Exhibits and Exhibitions

NCSM has special focus on providing hands-on and minds-on experiences to these young students. The goal is to encourage interaction of every young student with exhibits of science museums and centres and make them to understand concepts.





Popular Lectures on Contemporary S&T - Meet the Scientists

CV Raman Memorial Lecture on National Science Day at RSC, Bhopal

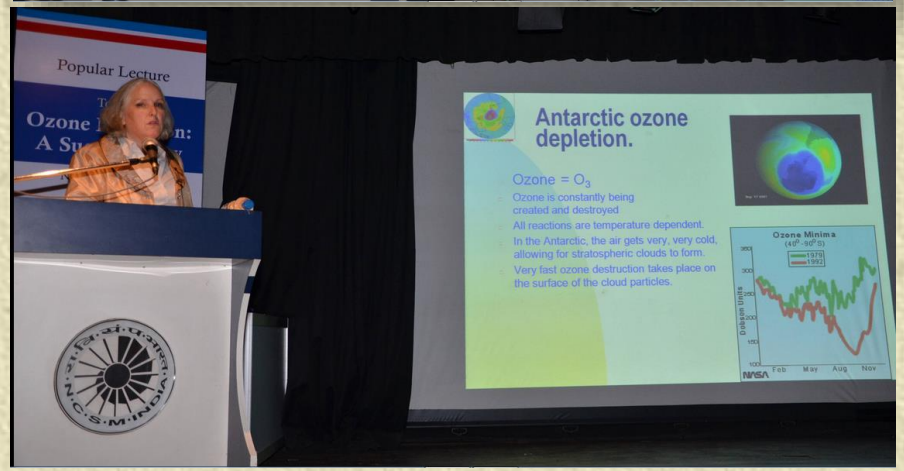
Popular Lecture during World Ozone Day at DSC, Gulbarga

Questioning Encouraged !

Popular Lectures on Contemporary S&T

Prof. Bimal K. Roy, Director, ISI, Kolkata

Prof. Somak Roychaudhuri, Department of Physics, Presidency University



Dr. Elizabeth Weatherhead, Professor, University of Colorado, USA

Mobile Science Exhibition for Rural Students

Mobile Science Exhibition (MSE) programme helps in enhancing public awareness, engagement, understanding and appreciation of science and technology and making hands-on interventions in science education using low cost curriculum based exhibits. NCSM at present 23 units of museobuses that cover 2 million rural students and public every year.

Sky Observation and Taramandal Show

International Collaborative Programs For Students

'Hacking Space : A Student Partnership to Sustain Life on Earth'

Youth Climate Summit-CoP21

Motivational Science Education Programs

World Environment Day 2015

June 05, 2015

Motivational Science Education Programs

National Technology Day 2015

May 11, 2015

Motivational Science Education Programs

Quest on World Science Day at RSC, Nagpur

Science Film Festival organized by DSC Purulia

Motivational Science Education Programs

Students visiting SCIENCE EXPO at RSC, Nagpur

Science March on National Science Day at SSC Patna

Motivational Science Education Programs

Open House Quiz during World Earth Day at NSC, Mumbai

Painting contest on National Technology Day programme at KPSC

Motivational Science Education Programs

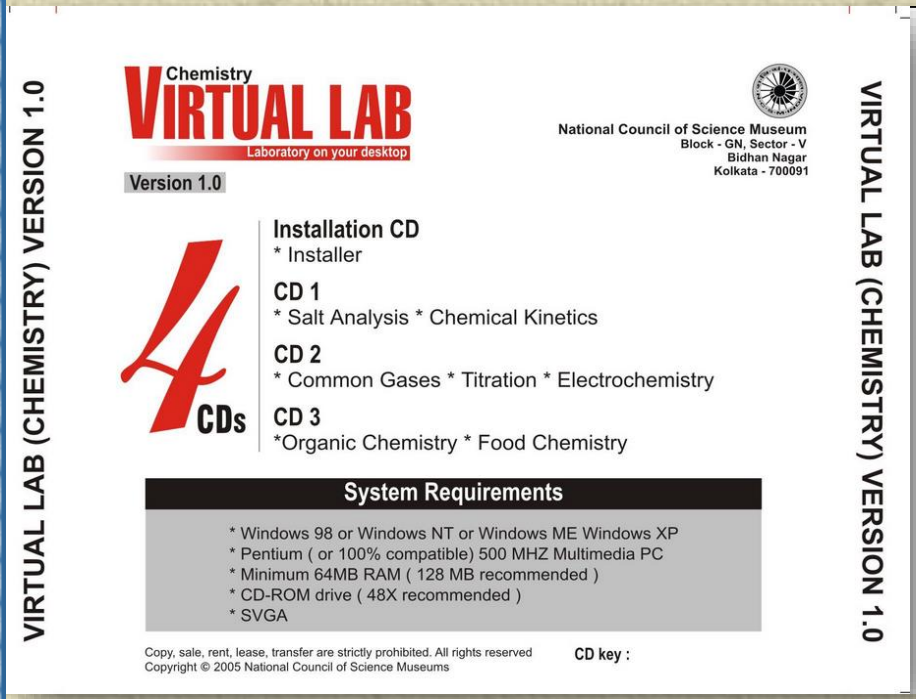
Participants in Physics & Mechanics Camp at VITM, Bengaluru

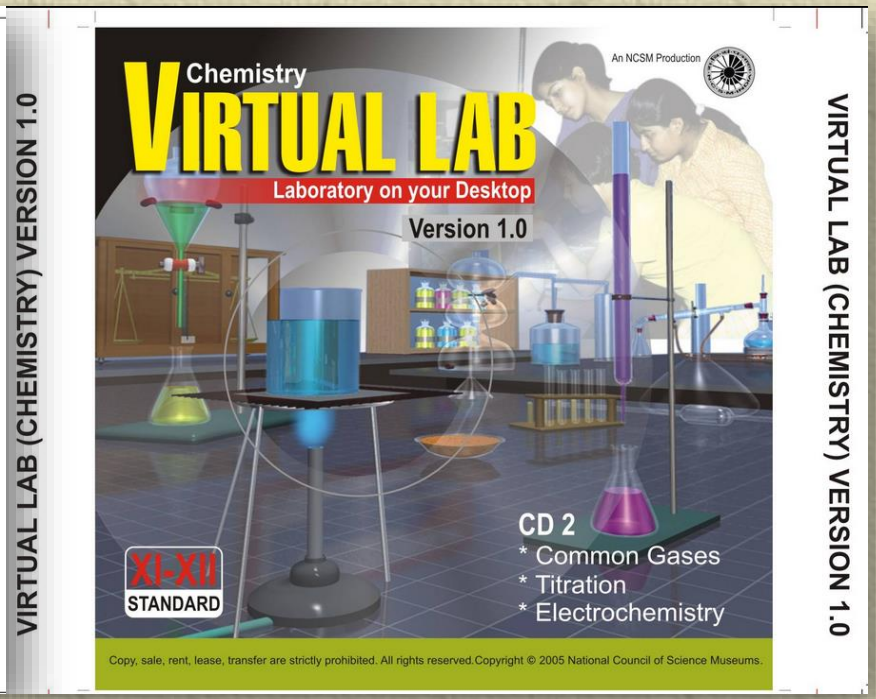
Students participating in workshop on Mathematics at VITM, Bengaluru

Motivational Science Education Programs

Learning by doing, students involved in sapling plantations in Nature Study camps

Online Learning Resources





Motivational Science Education Programs

Astronaut Sunita Williams with students at a function organised by National Council of Science Museums in Kolkata on Tuesday PTI

Impact of Science Centres/Museums

- Increased footfall & appreciation of science
- Increased demand for new centres
- Better understanding of concepts
- Enhancement in interest and motivation of students in STM

To Conclude……

NCSM is a premier and unique organization operating in the S&T landscape of the country and engaged in developing scientific temper in the society through its fast- growing nationwide network of science centres, interactive & engaging science activities for common man and students in particular and extensive rural outreach programmes.

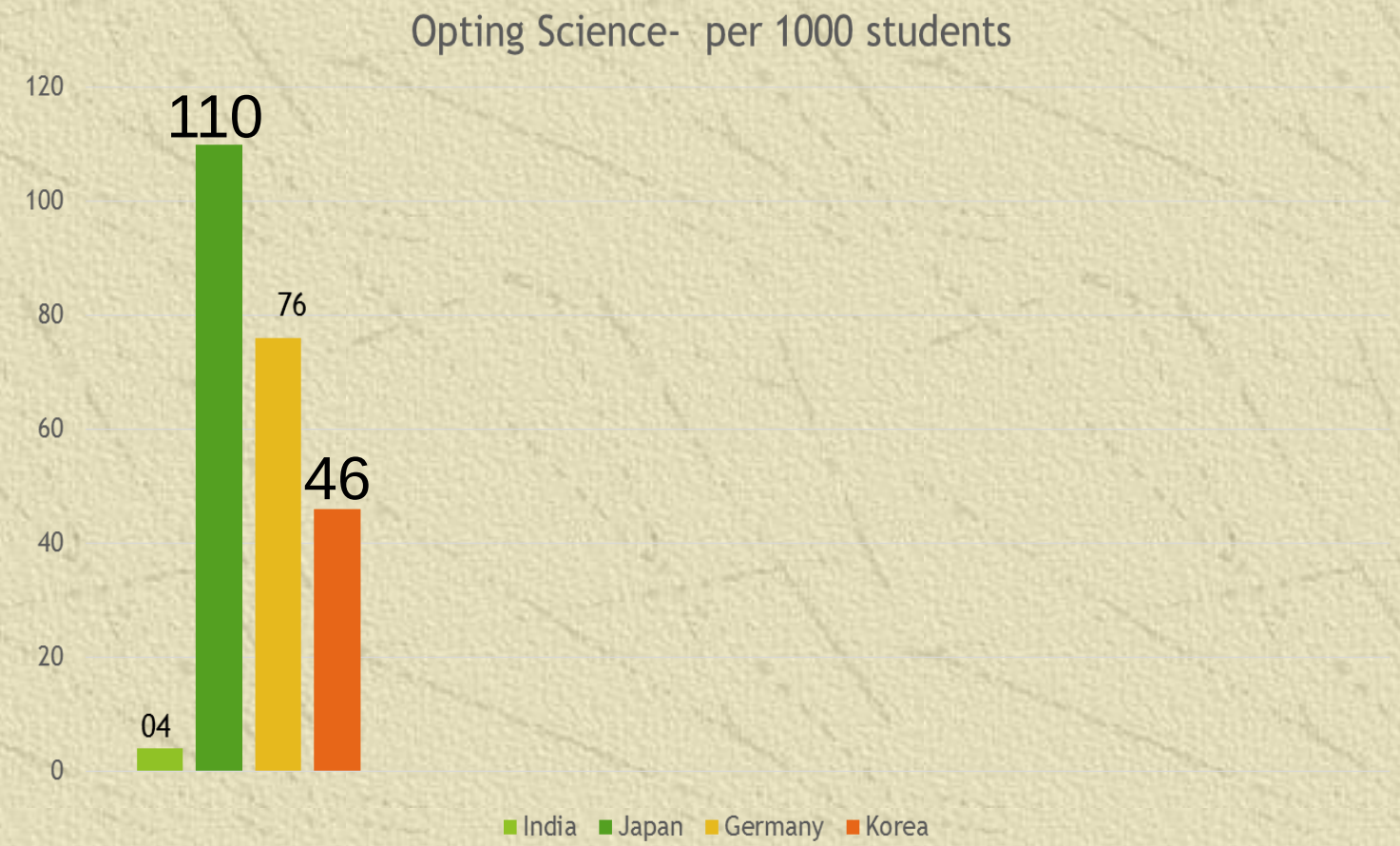
* Challenge : How to scale up the programme and how to synergise with formal education system?

Gaps in STM Programme

- **Minimum opportunities to identify and solve problems- no practical or discovery approach No encouragement for lateral and critical thinking- rote memory method practiced**
- **Minimal opportunities for self discovery & fruition of ideas**
- **Classroom transaction not enjoyable and stimulating enough**
- **Non-formal learning not given due importance**
- **Collaboration and peer participation not encouraged**
- **Inadequate out of school activities- focus on syllabus completion**
- **No or minimal awareness on innovation or innovators**
- **No systematic approach to inspire innovative thinking**

Result- Low enrolment in Science at higher level

Opting for Science



Way Forward

- Networking of formal and non-formal science education institutions, SCERT's, DIETS', CTE's etc.
- Non- formal learning be given due weightage in assessment
- Set up a national programme for professional development of science teachers including IT applications in classroom transaction
- Create hands-on spaces for non-formal science activities and labs for experiments with provision for a mentor to organize regular activities with emphasis on discovery, innovation and problem solving
- Allow sabbatical to master resource sc. teachers in IIT's, HBCSE, NCSM etc. to learn new and innovative methods, IT applications and low cost learning material development
- Set up an accreditation mechanism to monitor effectiveness and performance of teachers(Example-medical doctors have to attend certain number of lectures in a month) with inbuilt incentive scheme

- Include non-formal science as part of curriculum of teacher education courses . Introduce separate B.Ed or D.Ed for sc. teachers
- Science through activities be introduced at primary/middle school
- Encourage development and make available on-line learning resources to teachers
- Encourage vendor development for creation of science learning resource material
- Set-up district level resource centres for science education and training/professional development of science teachers

THANK YOU