

## HOMI BHABHA CENTRE FOR SCIENCE EDUCATION (TIFR) Teacher Professional Development Program

*Language of Workshops – English, Marathi, Hindi  
(School Science Research & Development)*

HBCSE has conducted workshops in teacher education, as and when there have been requests from schools and organizations. These workshops have been for the BMC Schools, Tribal Department Schools, Rayat Education Society, Satara, Shri Shivaji Education Society, Amravati, Maharashtra Prathamik Shikshan Parishad, SSA, RMSA, Bharatiya Vidya Bhavan Society, Atomic Energy Education Society, Kendriya Vidyalaya School System, DIET faculty of Bihar, West Bengal, Gujarat, Uttarakhand and varied individual school/teacher education colleges of Mumbai and Maharashtra.

HBCSE proposes to have regular workshops for teacher professional development (TPD), capacity building of school teachers/student teachers and/or teacher educators. These workshops would cater to the in-service or pre-service teacher training. It is proposed that these workshops be conducted on a regular basis throughout the year.

	Category of events	No. of workshops Period	Participants
1.	One day <i>exposure</i> workshops	10-12 workshops January – December	School Teachers/ student-teachers
2.	Three days <i>project based</i> workshops	3 workshops (1 each in the quarters) July – September October – December January – March	School Teachers/ Student-teachers
3	Five days <i>capacity building / TPD</i> workshops	2 workshops January – February July – August	School Teachers/ Teacher Educators
4	Two weeks <i>intensive course / refresher course</i> workshops	1 workshop August – November	School Teachers/ Teacher Educators

### Themes for Teachers Workshop:

A) Pedagogy	B) Content
1) Inquiry Based Science Learning: <ol style="list-style-type: none"> <li>a) Science through investigation,</li> <li>b) Prediction, Observation, Explanation (POE)</li> <li>c) Engage, Explore, Explain, Elaborate &amp; Evaluate (5E model),</li> </ol> 2) Teaching Learning Material (TLM): <ol style="list-style-type: none"> <li>a) Using low cost material,</li> <li>b) ICT,</li> </ol>	1) Water 2) Language and Science Learning 3) Habitat 4) Life and its Processes 5) Classification 6) Health and Hygiene 7) Matter 8) Heat, light and Sound

c) Audio Visual Learning, 3) Designing activities and experiments 4) Demonstration of experiments 5) Research Readings 6) Nature of Science: History of science 7) Socio-cultural aspects of education: Gender & Science, 8) Textbook Analysis 9) National Curriculum Framework, 10) Constructivist pedagogy; Learning & Constructivism, 11) Classroom observation, analysis, lesson study	9) Electricity and Magnetism 10) Motion 11) Energy 11) Acid and Base 12) Chemical Equations 13) Our Planet 14) Agriculture 15) Elements, Metal and non Metal
<b>C) Other Activities:</b>	
<ul style="list-style-type: none"> <li>• Laboratories (Integrated, Mathematics and Olympiads), Library</li> <li>• Exhibitions – History of Science; Gender and Science</li> <li>• Educational Theory, Practices , Issues, Policies</li> <li>• Assessment: CCE, Tools, Films, discussions</li> <li>• Visits to field, Science centers,</li> <li>• Analysis of teachers expectations and their experiences of the workshops</li> <li>• Designing and development of Concept Based Objective Tests</li> <li>• Networking of various Educational Systems and Teachers Associations</li> </ul>	

**Logistics:**

HBCSE has prepared a calendar of events of TPD workshops and announced it on its websites, and communicated the details through posters to nearby teacher education colleges, DIETs and schools. HBCSE will provide resources, materials, lecture rooms and labs for activities to the participants. Some of the workshops can be residential.

## Tentative Schedule

### 1a. Half day visit program for students and student-teachers

The workshop would provide a glimpse of the Centre's activities, labs, library, exhibitions along with a few lecture sessions explaining HBCSE's TPD program and what to expect in follow-up programs.

<b>Time</b>	<b>Session</b>
9.00 – 9.30	Introduction to HBCSE
9.30 – 11.30	Inquiry Based Science Learning (Yes, You Can Do It!)
11.30 – 1.00	Fun of Mathematics
1.00 – 1.30	History of Science /Gender & Science Exhibitions / Library/ Publications

**No. of Workshops: Monthly, second week, Wednesday**

**Number of Participants: 40 (with 2-4 teachers)**

**OR****1b. One day visit program for student-teachers**

The workshop would provide a glimpse of the Centre's activities, labs, library, exhibitions along with a few lecture sessions explaining HBCSE's TPD program and what to expect in follow-up programs.

<b>Time</b>	<b>Session</b>
9.00 – 9.30	Introduction about HBCSE
9.30 – 11.30	NCF, Learning and Constructivism
11.30 – 1.00	Inquiry Based Science Learning (POE; Yes, You Can Do It!)
2.00 – 3.30	Fun of Mathematics
3.30 – 4.30	Ask your question/quiz/Puzzle session or Design an activity/quiz/teaching aid
4.30 – 5.00	History of Science /Gender & Science Exhibitions / Library/ Publications

**No. of Workshops: Monthly, second week, Wednesday**

**Number of Participants: 45-55 (with 2-4 teacher educators)**

**1c. One day workshop/seminar for student-teachers/In-service teachers**

<b>Time</b>	<b>Session</b>
09.00 – 09.30	Introduction about HBCSE
09.30 – 10.30	NCF, Learning and Constructivism
10.30 - 12.00	Role of activities/experiments in school science
12.00 – 01.00	Fun of Mathematics
02.00 – 04.30	Inquiry Based Science Learning (Yes, You Can Do It!)
04.30 – 05.00	History of Science /Gender & Science Exhibitions / Library/ Publications
05.00 – 05.30	Feedback/discussion

**No. of Workshops: Monthly, second week of Wednesday**

**Number of Teachers: 35-45**

**2. Three days project based workshops for practicing science teachers**

This workshop will cater to student-teachers/teachers. The main emphasis will be on doing hands-

on science experiments and science through investigation activities. Since the student-teachers/teachers do not get enough exposure to science experiments, HBCSE will aim to provide them with an opportunity to gain experience in this regard. These workshops can be scheduled before the beginning of the school term to enable the participants to prepare for their immediate teaching jobs. There may also be sessions on preparing activity based modules where teachers may be involved in designing and writing the modules and worksheets/handouts.

Day/Time	09:00 – 9:30	09:30 - 10:30	11.00-12.00	12:00 - 13:00	14:00 – 16:00	16.00-17.00	17:00 - 17:30
Day 1	Need Assessment	Introduction & Inauguration	NCF/SCF	Nature of Science	Hands-on or Science through investigation	Role of ICT in Education	Discussion Session (Movie clips/ different issues)
Day 2	Feedback	Concept map	Trends in education	Socio-cultural issues in education		Learning Resources	
Day 3	Feedback	Unifying Concepts in Science	Students conceptions	Assessment & evaluation		Feedback & Valedictory	

**Number of Teachers: 35-45**

**No. of Workshops: 3 in a year**

**Schedule: One each during July – September; October – December; January – March**

**List of themes:[Any one]**

A) Pedagogy	B) Content: [Any one]
1) Inquiry Based Learning: - POE, 5-E model, 2) TLM- Using low cost material, ICT, Audio Visual Learning, 3) Demonstration of experiments 4) Nature of Science- History of science 5) Socio-cultural aspects of education “Gender & Science,” 6) Textbook Analysis 7) NCF and constructivist approach 8) Classroom observation, analysis (lesson study),	1) Water 2) Language and science learning 3) Habitat 4) Life and its Processes 5) Classification 6) Health and Hygiene 7) Matter 8) Heat, light and Sound 9) Electricity and Magnetism 10) Motion 11) Energy 12) Elements, Metal and non Metal

### 3. Five days capacity building/ TPD workshops for teachers, teacher educators

These five days TPD workshops can be framed on themes viz., learning & constructivism, assessment, textbook analysis, research readings, learning by doing science, inquiry based science, innovative teaching, socio-cultural aspects of education, etc. There may be a possibility of follow-up workshops for the same group in this type of workshop.

Day/Time	09:00 – 9:30	09:30 - 11:00	11:30 - 13:00	14:00 – 16:00	17:00 - 17:30
Day 1 Mon	Need Assessment	Introduction & Inauguration	NCF/SCF or Constructivist approach	Science Through investigation and Presentation	Discussion Session  (Movie clips/different issues)
Day 2 Tues	Feedback	Nature of Science	Role of ICT in Education		
Day 3 Wed		Unifying Concepts in Science	Concept map		
Day 4 Thu		Socio cultural issues in education	Assessment and evaluation		
Day 5 Fri		Action research or research in SE	Learning resources	Workshop presentation	Conclusion and Valedictory

**Number of Teachers: 35-45**

**No. of Workshops: 2 in a year**

**Schedule: One each during the months January – February; July – August**

#### Themes

A) Pedagogy [Any one from group 1 and 2 with other activities]	B) Content [ Any two]
<p><b>Group 1</b></p> <p>1) Inquiry Based Learning:-Science through investigation, POE, 5-E model, 2) Designing activities and experiments 3) NCF, Learning and Constructivism, Constructivist pedagogy 4) Demonstration of experiments 5) Educational Theory, Practices, Issues, Policies 6) Research Readings or Lesson Study</p> <p><b>Group 2</b></p> <p>1) Research Readings</p>	<p>1) Water 2) Language and science learning 3) Habitat 4) Life and its Processes 5) Classification 6) Health and Hygiene 7) Matter 8) Heat, light and Sound 9) Electricity and Magnetism 10) Motion 11) Energy</p>

2) Textbook Analysis 3) Classroom observation, analysis	12) Elements, Metal and non Metal
<b>C) Other Activities:</b>	
<ul style="list-style-type: none"> <li>Laboratories (Integrated, Mathematics and Olympiads), Library,</li> <li>Exhibitions – History of Science; Gender and Science</li> <li>Educational Theory, Practices , Issues, Policies</li> <li>Assessment: CCE, Tools, Films, discussions</li> <li>Visits to field, Science centers,</li> <li>Analysis of teachers expectations and their experiences of the workshops</li> </ul>	

#### 4. Two weeks intensive course / refresher course for teacher educators

This course is meant for teachers or teacher educators who are required to participate in professional development as part of their in-service teacher training. The workshops can be framed on themes viz., learning & constructivism, assessment, textbook analysis, research readings, learning by doing science, inquiry based science, innovative teaching, socio-cultural aspects of education, etc. There is a possibility of follow-up workshops for the same group in this type of workshop, which can be worked out on a case by case basis at mutually convenient times.

Day/Time	09:00 – 09:30	09:30 - 11:00	11:30 - 13:00	14:00 – 16:00	17:00 - 17:30
Day 1, Mon	Need Assessment	Introduction & Inauguration	NCF/SCF	Science through investigation Presentation	Discussion Session
Day 2, Tues	Feedback & Discussion	Nature of Science	Role of ICT in Education		(Movie clips/different issues)
Day 3, Wed		Unifying Concepts in Science	Concept map		
Day 4, Thu		Nature of Science	Design & Technology		
Day 5, Fri		Role of language	Students conceptions		
Day 6, Sat	School Visit or Other institute visit (Such as NSC, NP, National park)				
Day 7, Sun	Free time: sightseeing				
Day 8, Mon	Feedback & Discussion	Research in SE	Assessment & evaluation	Research reading	Discussion Session
Day 9, Tues		Research in SE	Socio cultural issues in education	or textbook analysis	(Movie clips/different issues)
Day 10 Wed		Lesson study	Assessment & evaluation	Presentation	
Day 11, Thu		Lesson study	Assessment & evaluation		
Day 12, Fri		Scientific method	Socio cultural issues in education	Workshop Report	Conclusion and

				Presentation	Valedictory
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**Number of Teachers: 35-45**

**No. of Workshops: 1 in a year (two weeks i.e. 12 days)**

**Schedule: During August – November**

### Themes

A) Pedagogy [Any three/four]	B) Content [Any four]
1) Inquiry Based Science Learning: Science through investigation, POE, Five E model, 2) Teaching Learning Material (TLM): Using low cost material, ICT, Audio Visual Learning, 3) Designing activities and experiments 4) Demonstration of experiments 5) Research Readings 6) Nature of Science: History of science 7) Socio-cultural aspects of education: Gender and Science 8) Textbook Analysis 9) National Curriculum Framework, 10) Constructivist pedagogy- Learning and Constructivism, 11) Classroom observation, analysis (Lesson Study)	1) Water 2) Language & Science Learning 3) Habitat 4) Life and its Processes 5) Classification 6) Health and Hygiene 7) Matter 8) Heat, light and Sound 9) Electricity and Magnetism 10) Motion 11) Energy 11) Acid and Base 12) Chemical Equations 13) Our Planet 14) Agriculture 15) Elements, Metal & non Metal

### C) Other Activities:

- Laboratories (Integrated, Mathematics and Olympiads), Library,
- Exhibitions – History of Science; Gender and Science
- Educational Theory, Practices , Issues, Policies
- Assessment: CCE, Tools, Films, discussions
- Visits to field, Science centers,
- Analysis of teachers expectations and their experiences of the workshops

### Contact

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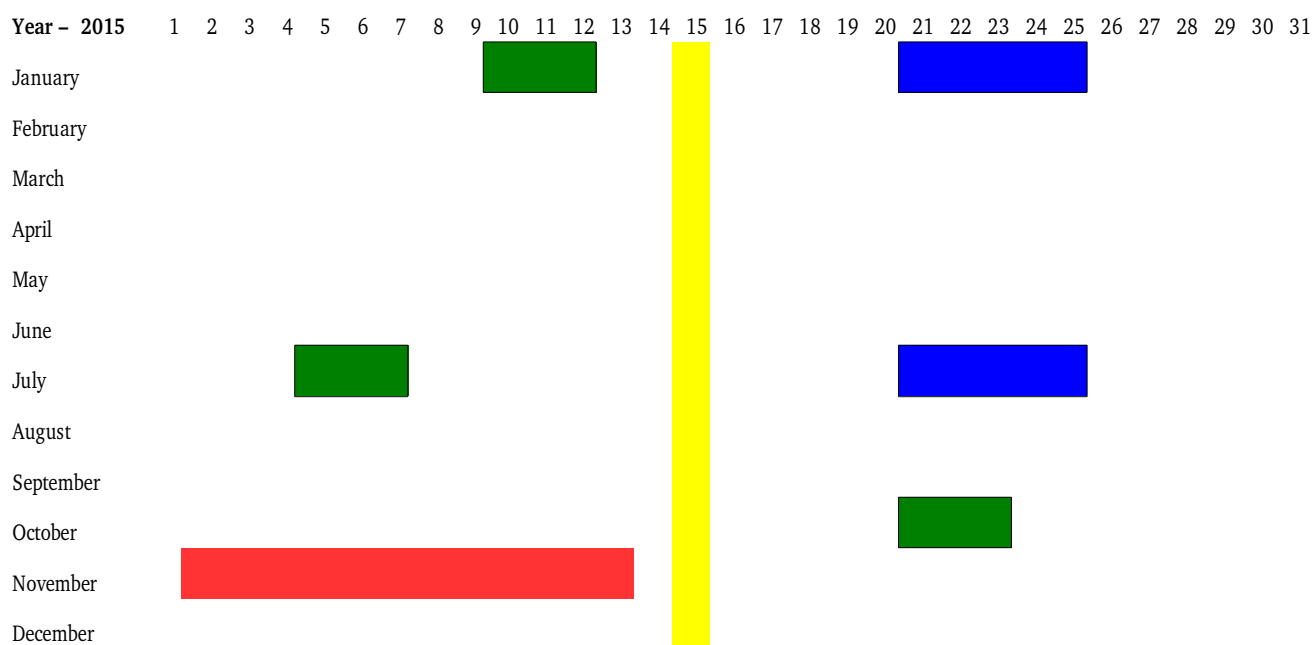
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**Websites:**

<http://www.hbcse.tifr.res.in>

<http://teacher-ed.hbcse.tifr.res.in>

Homi Bhabha Centre for Science Education (TIFR)  
Teacher Professional Development Program – Annual Schedule



- Half day, One day workshops
- Three days project based workshops
- Five days capacity building/TPD workshops
- Two weeks intensive course / refresher course workshops

1<sup>st</sup> December 2014