

**File No.**  
**Government of India**  
**Ministry of Human Resource Development**  
**(Department of School Education and Literacy)**

Shastri Bhawan, New Delhi  
Date: 28<sup>th</sup> May, 2015

**ORDER**

**Subject: Guidelines on the Rashtriya Avishkar Abhiyan regarding.**

In pursuance of the focus on connecting school based knowledge to life outside the school and making learning of Science Mathematics a joyful and meaningful activity, tobring focus on innovation and use of technology, the Ministry of Human Resource Development has set up the *Rashtriya Avishkar Abhiyan*(RAA)- a convergent framework that aims at nurturing a spirit of inquiry and creativity, love for Science and Mathematics and effective use of technology amongst children and encourage those who show an inclination and talent for these subjects to be encouraged and supported to heights of academic excellence and research.

Rashtriya Avishkar Abhiyan will target students in the age group of 6 - 18 years and inturn the execution of RAA will span across MHRD's schematic interventions of Sarva Shiksha Abhiyan, Rashtriya Madhyamik Shiksha Abhiyan in the Department of School Education & Literacy and programmes and schemes of Department of Higher Education to encourage Science, Mathematics & Technology.

**Background to RAA**

Science, Technology and Innovation have emerged as the major drivers of national development globally. India, with its near universalisation of access in school education and expanding Higher Education and Scientific institutions both under the government and private sectors, wants to give a direction to drive future innovations by encouraging children in exploration, discovery and innovation to support aclimate of innovation by teachers and students at school level.

The Kothari Commission (1964) noted that the destiny of this country is shaped in the classrooms and laboratories of schools, colleges and universities. India's Curriculum Framework recognisesconnecting knowledge to life outside the school and notes that learning takes place both within school and outside school andseeks to design learning tasks beyond textbooks and schools.

The Yashpal Committee report (1993) *Learning without Burden* expressed concern over the esotericisation of Science also on the tendency embedded in the syllabi and textbooks to accelerate children's mathematical skills by teaching mechanical rules at the expense of understanding.

### Aim

While emphasising the primacy of the schools and classroom transactions, the RAA aims to leverage the potential for science, mathematics and technology learning in non-classroom settings. Beyond the four walls of a classroom, opportunities for science, mathematics and technology learning abound.

Accordingly, the 'Rashtriya Avishkar Abhiyan (RAA)' is planned to provide nourishing and nurturing support to and a platform for schools in a *dual track approach* to make Science, Mathematics and Technology exciting to children and encourage them to have an enduring interest both inside classroom and outside classroom activities.

### Objectives

- To enable children to become motivated and engaged in Science, Mathematics and Technology (SMT) through observation, experimentation, inference drawing, model building, rational reasoning, testability etc.
- To create curiosity, excitement and exploration among school children in Science, Mathematics and Technology.
- To create a culture of thinking, inventing, tinkering and doing to promote enquiry based learning in Schools.
- To achieve learning levels appropriate to the class of study in Science and Mathematics.
- To encourage and nurture schools to be incubators of Innovation.

### Target Age group, Classes and Schools

Target Age group	Every child of 6-18 Years age
Target classes/ courses	1. Children from Classes I to XII
	2. Children of Open Schools 6-18years
	3. Children of Special Schools (for disabled children)
	4. Children studying in Special Training Centres (bridge programmes)
Target School / Institutions	1. State / UT Government and local body Schools
	2. Kendriya Vidyalayas, Navodaya Vidyalayas and other Central Government Schools
	3. Special Schools (for disabled children)
	4. Open Schools systems of children of 6-18 years

### **Major interventions under RAA**

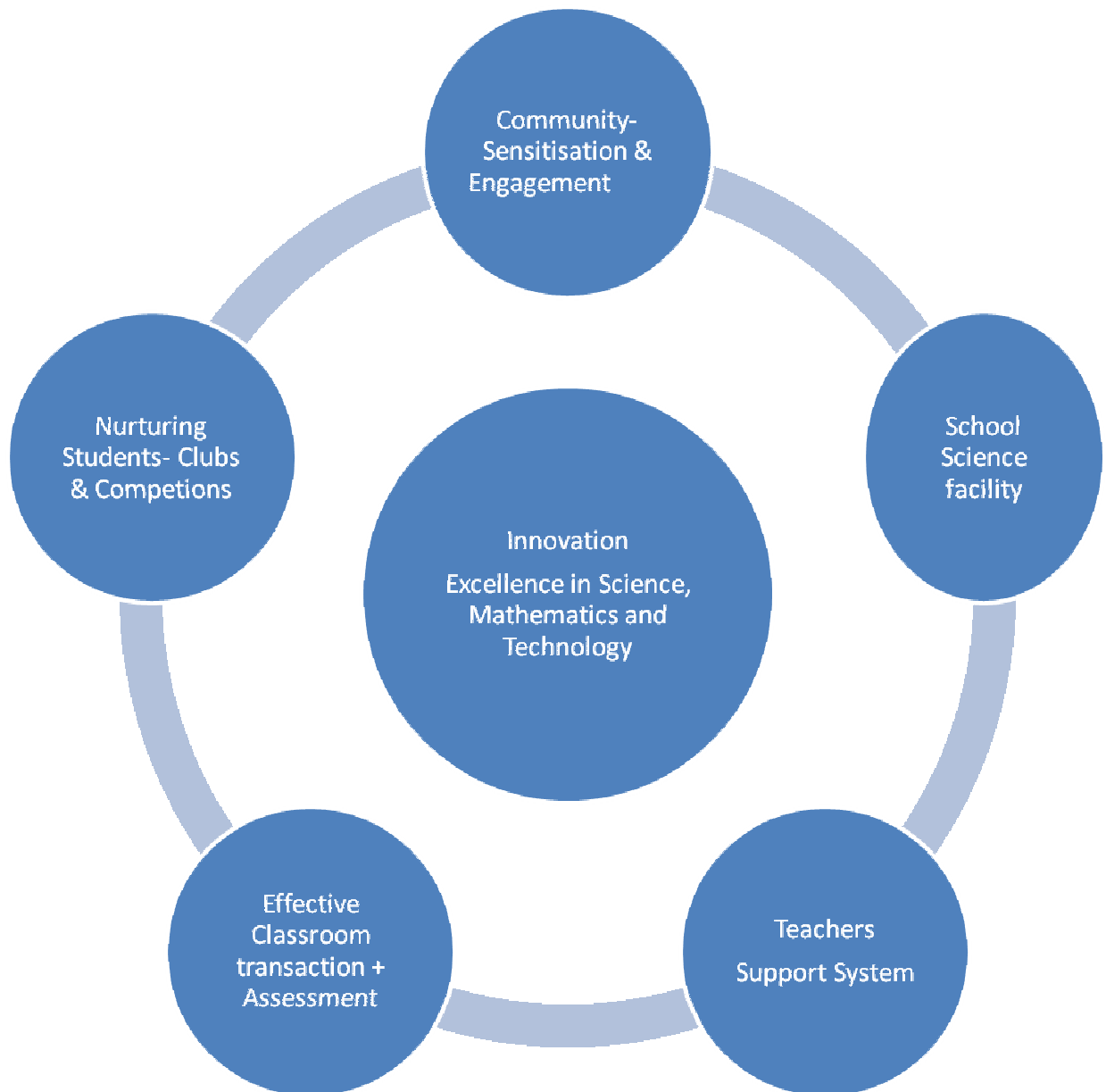
#### **(I) Systemic improvements in the School System**

- Teacher Preparation for Science, Mathematics and Technology: Pre-Service and In-Service
- Assessment design for Science and Mathematics for students
- Recruitment of Science and Mathematics Teachers.
- Strengthening School Science Laboratories and Mathematics Laboratories
- Provision of teaching-learning equipments and supplementary books/materials to enhance Science and Mathematics transaction in classrooms.
- Use of Technology in Science and Mathematics teaching
- Development of resource materials
- Strengthening teacher support institutions and in the use of technology
- Effective classroom transaction : teaching – learning.

#### **(II) Initiatives to encourage Science, Mathematics through alternative strategies**

- School Mentoring for Science & Mathematics teaching by Higher Education Institutions.
- Teacher Circles on Science, Mathematics and Technology
- Science/Mathematics Clubs for Children
- Expand outreach of programmes of Ministry of Science and Technology to promote science learning.
- Participation of Students in Inter-school, State/National Maths and Science Competitions/ Olympiads etc.
- Organised visits to Science Museums and Science fairs and Mathematics Melas.
- Parents and community sensitisation.

## Specific initiatives planned under the Rashtriya Avishkar Abhiyan



#### Teachers

1. Capacity building-Pre- & In-Service
2. Filling up of Science & Maths Teacher Vacancies
3. Teacher Circles: peer learning
4. Mentoring by Higher Education Institutions (HEI)
5. Opportunity for Demonstration, practice and reflection
6. Academic support- BRP & CRP
7. Membership in State / National Teachers Science & Mathematics Congress /Associations

#### School Science Facility

1. Science & Math Laboratories with kits
2. Teaching-learning equipments, Models, books
3. Provision and access of Technology
4. Mentoring by HEI/ Industry

#### Community

1. Promotional communication strategy to sensitise society on Science and Mathematics education
2. Community-Scientist interactions
3. Engagement in Classroom teaching
4. Invitation/ Participation in Science activities

#### Assessment- Redesign to promote problem solving and comprehension

#### Effective Classroom transaction

1. Engagement with every child
2. Hands on-Activity based learning (tod phod jod)
3. Problem Solving
4. Modelling
5. Experimentation & Demonstration
6. Self learning
7. Peer to peer collaborative learning
8. Online resources ( in local language) use
9. Culture of Beyond Text books and inquiry based learning

#### Students

1. Science & Mathematics Clubs
2. Mentoring by HEI and Graduate Students at School
3. Visit to Science Museums / Innovation Hubs / Industry
4. Activities/Contests on contemporary scientific events
5. Internship at Mentoring Institutions (HEI)
6. National Children's' Science Congress
7. Competitions and Olympiads
8. DST INSPIRE
9. Incubation of Student innovations

## **Detailed guidelines for the interventions**

### **1.1 Systematic Improvements in the School System**

#### **1.1.1 Teacher Preparation:**

##### **1.1.1.1 Pre-Service Teacher Education**

Review of Teacher Education Programmes curriculum (viz., D.El.Ed., B.Ed. etc.) on Science, Mathematics and Technology with emphasis on problem solving, critical thinking, and reflective learning and on incorporating the use of technology in Science and Mathematics teaching-learning, pedagogy and assessment systems.

##### **1.1.1.2 Teacher In-Service Capacity building**

- (i) Enlist best and brightest teachers in Science and Mathematics in the State/ UT as Master Teachers for developing training designs and training modules for Science and Mathematics separately for primary and upper primary, secondary and senior secondary levels. Teacher training modules to promote spirit of enquiry, discovery, project work and investigation, validation and application of concepts in day to day life of a child.
- (ii) Capacity building of Teacher Educators in SCERT, CTEs & IASEs, DIETS & Block and Cluster Resource Centres on the design, modules and conduct of In-service teacher training in Science and Mathematics.

##### **1.1.1.3 Mentoring System**

Teacher Mentoring by Science, Math Teacher based Higher Education Institutions/ R&D Institutions/Private S&T Institutions. Basic guidelines for mentoring by Higher Education Institutions & SC/Maths organizations to include:-

- (i) Support – material (print, ICT-NROER, lab resources, space, maps), institutional (policy, network, scheduling), and intellectual (subject experts, college teachers, researchers) are provided with resource material viz. Posters, Audio-visual material, visually rich handbooks, pamphlets, videos etc. to facilitate conceptual understanding of different aspects.
- (ii) Block/Cluster level Meetings with Teacher SMT Circle members and for Peer learning. Peer discussion to include teaching processes, children learning behaviour, their interests, and their resources and ways in which these can be brought into the classroom for improved learning outcomes.

(iii) Demonstration, practice and reflection opportunity for Teacher to observe, learn and space for making and doing and get opportunity for classroom and beyond classroom practice under guidance in pedagogy & methodology sensitive to the diversity of learners and learning situations.

(iv) Academic support: Access to Resource Persons (BRP/CRP) for guidance and feedback and innovation.

**1.1.1.4 National Teachers Science Congress (NTSC):** encourage and support teachers to communicate and share innovative concepts/methodologies in the fora. Mentoring Institutions to help identify and nurture Science & Maths teachers towards this goal.

**1.1.1.5 Teacher's as Change Agents:** Orientation of School Head Masters and Teachers to nurture student Science and Mathematics clubs/ circles as motivators (not as Educators) to create excitement and stimulation for SM&T among students/children.

### **1.1.2 Assessment Design for Science and Mathematics for students**

**1.1.2.1** Development of appropriate methods for Continuous and Comprehensive Assessment learning of Science & Mathematics by teachers, where in students are assessed not for rote learning of Science and Mathematics concepts but by testing their comprehension through applications and projects, problem solving and creative use of concepts etc.

**1.1.2.2** Workshops & seminars to be held with school boards to rectify assessment systems. Mentoring Institutions Science/ Maths organizations, Department of Science & Technology and National Council of Science Museums (NCSM) to play a lead role in this task.

### **1.1.3 Recruitment of Science and Mathematics Teachers**

**1.1.3.1** States and UTs must have earmarked teacher posts for Science and Mathematics from classes VI to XII and recruitments be done with teachers with Science and Mathematics background as per NCTE guidelines Regular monitoring of States/UTs for filling up of vacancies.

**1.1.3.2** States Governments & Universities to keep register of Science & Maths graduates and organize regular counseling services to attract such graduates to Teacher Professional Degrees/Diplomas such as D.Ed. & B.Ed. etc.

### **1.1.4 Strengthening School Science and Mathematics Laboratories**

School Science Laboratories will be strengthened based on set standards. The students will be given opportunity to explore and visualize science and mathematics ideas, concepts through activities and enhance their understanding of the subjects through critical thinking and problem solving skills. All the elementary and secondary Schools

will be provided Science and Mathematics Kits to augment materials for use in mathematics to understand concepts as well as to build upon understanding for applications and problem solving. Funds under centrally sponsored schemes can be accessed for the purpose. Mentoring Institutions can help & guide schools/States Govt. to build appropriate & modern school laboratories.

#### **1.1.5 Provision of Teaching-learning equipment and materials**

Good scaffolding and other conceptual, physical demonstrations, mathematical and statistical visualization and digital models which fosters active engagement of children in the classrooms be encouraged. All schools be provided with a variety of science and mathematics models and science magazine for example (National Institute of Science Communication and Information Resources) for active engagement of children. In addition, School libraries be enriched with books for teachers and students to sustain interest in Science, Mathematics and Technology.

#### **1.1.6 Use of Technology in Science and Mathematics teaching**

The Higher Secondary, Secondary and Upper Primary Schools will be incrementally supported with ICT infrastructure to support Science and Mathematics teaching/learning in order to transform the scope of classrooms to e-classrooms, rich in audio-video, demonstrations and access to internet.

#### **1.1.7 Development of Resource Materials**

MHRD will constitute an Institutional consortium under the joint leadership of NCERT, DST and National Council of Science Museums (NCSM) to undertake the following activities viz.,

- (i) NCERT in collaboration with DST VigyanPrasar, National Children Science Congress and National Science Teachers Congress will systematise availability of academic resources on Science & Mathematics in the country.
- (ii) The online resources available at NCERT NROER (National Repository of Open Educational Resources) will be further improved with the collaboration of Children's Science Centre, Pune, UNESCO, Homi Bhabha Centre for Science Education and other organizations working for promoting science math teacher education in the country.
- (iii) NCERT, National Book Trust, VigyanPrasar, Bal Bhawans, National Computer Saksharta Mission, Sahitya Akademi, National Council for Science & Technology Communication and other institutions be encouraged to make available their publications in e-format in the public domain.
- (iv) NCSTC, NCERT and National Book Trust to translate popular science books available in public domain in different scheduled regional languages.
- (v) Individual authors be invited to contribute e-Books.

#### **1.1.8 Strengthening teacher support institutions through use of technology**



The State SCERT/SIE, IASE, CTE, DIETs and Block and Cluster Resource Centres be strengthened with specific emphasis on Science and Mathematics by constituting a Resource Group at each level and build their capacity by networking them with Higher Education Institutions, Teacher Circles and Science Congress etc. The teacher educators and academic support institutions (SCERT, DIETs, BRC and CRCs) also be empowered in using ICT in science and mathematics teaching-learning and activities.

### 1.1.9 Effective Classroom transaction: teaching –learning.

Endeavour is for an enabling Class room transaction with following features viz.

Sustained & Active engagement with every child	Hands on-Activity based learning	Problem Solving
Experimentation & Demonstration	Modeling	Self- Learning
Peer-to-Peer Collaborative Learning	Online resources	Culture of Beyond Text books and inquiry based learning

- Sustained & Active engagement with every child.
  - Teaching –learning preferably be in the mother tongue of children /child’s home language/language of school instruction related to daily life experience and socio-cultural context, especially in case of primary classes.
  - Encouraging children to share their experiences, news and observations in nature in the class and use their talk as a resource in building classroom discussion richer.
  - Allow children to invent their own ways of using existing vocabulary to convey science and mathematical ideas.
  - Encourage children to express their scientific and mathematical findings.
  - Opportunity to respond, discuss and share STM readings and books.
  - Encouraging children to participate in classroom activities through asking questions and framing of problems.
  - An environment that tolerates learning from failures and therefore motivates children (and teachers) to be creative, and think out-of-the-box.

- Encouragement for perseverance, by providing positive reinforcement for persevering on tasks; and by not rewarding only the fastest correct answer.

- Hands on-Activity based learning (*tod phod jod*)
- Problem Solving
- Modeling
- Experimentation & Demonstration
- Self learning
- Peer to peer collaborative learning
- Online resources ( in local language) use
- Culture of Beyond Text books and inquiry based learning.

## **1.2 Initiatives to encourage Science, Mathematics through alternative strategies**

### **1.2.1 School Mentoring:**

**1.2.1.1** Higher Education Institutions (HEI) will be encouraged and networked to mentor neighbourhood Higher Secondary, Secondary and Upper Primary schools over a period of 5 years. They will be called Mentoring Institutions.

Homi Bhabha Centre for Science Education (HBCSE), Indian Institutes of Technology (IITs), Indian Institute of Science Education and Research (IISERs), National Institutes of Technology (NITs), National Council of Science Museums (NCSM) and other institutions would provide the leadership and engage with mentoring of schools.

**1.2.1.2** The Department of Science and Technology and National Council of Science Museums (NCSM) through its various agencies would also play a major role in mentoring and encouraging activities in schools for the promotion of Science.

The students of Indian Institutes of Technology /NIT and other premier Institutions may be encouraged to mentor KVS & NVS school students to take up local problem solving projects.

For the purpose the State/UT Govt. will map schools and Higher Education Institutions and then network each other considering neighbourhood, mutual convenience and subject interests etc.

**1.2.1.3** The role of these Mentoring Institutions would be to:

1. To improve student engagements through Science and Mathematics activities in schools.
2. To create a culture of “making and doing” by students and teachers.

3. To encourage collaborative engagement of teachers and students with planned and coordinated sustenance in the form of material access (resources, documentation and e-materials), institutional support (work load, scheduling, flexibility etc.) and intellectual support (content experts, mentoring, etc.).
4. To ensure technology enabled scientific talks at schools.

## **1.2.2 Promotion of Science & Mathematics Teacher Circles**

**1.2.2.1** Teachers of Science and Mathematics in Schools to be grouped by Mentoring Institutions in teacher circles at decentralised levels on a voluntary basis. The Mentor Institutions would endeavour to develop teacher capacities for teaching Science and Mathematics in new and empowering ways so as to render the experience of Science & Maths teaching in an engaging manner for children.

**1.2.2.2** Mentoring Institutions would try to engage teachers as a community, with the depths and intricacies of specific subject details (Science and Mathematics) to propagate a culture of doing and creating knowledge through problem-solving, 12 programme and demonstration.

**1.2.2.3** The Monitoring Institutions would try and propagate a culture of “beyond text books” to bring live Science, Mathematics and Technology issues in to the classroom.

**1.2.2.4** The MIs would help to provide a platform (at decentralised levels) for teachers to share experiences with each other, make & present presentations of their professional experiences – innovations, successes and failures in teaching-learning of Mathematics and Science – with their peers. The MIs would provide expert mentoring and build partnerships in these meetings.

The MIs would help form & sustain Teacher Circles that can be

- I. Subject oriented Circles
- II. Project-based clubs/Circles
- III. Problem-solving circles
- IV. Guided exploration circles
- V. Research mathematicians/Scientists
- VI. Topic-centred clubs
- VII. Applied math /technology clubs

**1.2.2.5** Teacher Circles/ Clubs in Science and Mathematics would encourage local school-based programs, development of low cost Science and Mathematics kits for schools to use, local campaigns on natural events/phenomenon in Science, residential summer programs for teachers for up-gradation in Science and Mathematics teaching, methods, organise

local Math/Science contests for students and teachers or both, teaching Workshops/Seminars/Demonstrations on fun with mathematics/science lessons, organisation of local Science Exhibitions/Book fairs/Math Melas, publish media articles on Science & Mathematics, activities on Contemporary scientific events to create awareness etc.

**1.2.2.6** Provision of Good books for teachers in different languages and e-format.

**1.2.2.7** Subscription/ Membership to local, regional, State and National Teacher Science & Mathematics Associations/ Circles/ National Teachers Science Congress (NTSC)

**1.2.2.8** Participation in National Teachers Science Congress and activities of nearby Research /R&D Institutions/Mentoring Institutions.

### **1.2.3 Science, Mathematics and Technology Clubs for Children**

**1.2.3.1** MHRD in partnership with Vigyan Prasar (DST) and National Council of Science Museums (NCSM) will assist schools in a nationwide effort to institutionalise science clubs for students in schools for Science and Mathematics. Mentoring Institutions will play a lead role in formation of these clubs. Science based reputed voluntary agencies could also be involved at local level to provide necessary support to building activities of Science Clubs and popularise them in schools amongst children and local communities.

**1.2.3.2** The objectives of the Science & Mathematics clubs would be to:

- a. Stimulate a spirit of curiosity, enquiry, innovation and creativity amongst students/children through activities which would supplement conventional (in class) education and make science and mathematics an enjoyable and interesting pursuit.
- b. Motivate children and youth to take up scientific activities and contribute towards the cherished goals of achieving a scientific society.
- c. To transform teachers as a facilitator and change agent (from that of educator)
- d. To encourage and empower students to participate in the National Children's Science Congress.

**1.2.3.3** Informal out-of-school engagement with Science and Maths Teachers would typically be learner-motivated, guided by learner interests, be voluntary, contextually relevant, collaborative, nonlinear, and as often open-ended. The activities to be undertaken under the RAA, thus would have to be:

- Designed to be interactive, support and encourage learners to extend their learning over time
- Provide multiple ways for learners to engage with concepts, practices, and phenomena

within a particular setting

- Promote and support participants to interpret their learning experiences in the light of relevant prior knowledge, experiences and interests
- Developed through partnerships with appropriate expert(s)/ agencies and wherever possible be rooted in scientific problems and ideas that are relevant for the local community.
- All educational tools and materials should be developed through iterative processes involving learners, educators, designers, and experts in SMT through appropriate field trials.

**1.2.4 Expand outreach of programmes of Ministry of Science and Technology and National Council of Science Museums (NCSM) for school children,** to cover schools across the country and for wider participation of children. The schemes of MHRD, SSA and RMSA would enhance the outreach of DST and NCSM programmes to all Govt. Upper Primary Schools and all Govt. & aided Secondary schools as per approved norms.

**1.2.4.1** DST's Scheme for Early Attraction of Talents for Science (INSPIRE) involving identification of students of classes 6-10 of age group 10-15 years, for INSPIRE awards to seed and experience the joy of innovation with Rs.5000/ per child (one time grant) would be popularized across schools to enable greater participation from all schools.

**1.2.4.2** INSPIRE Internship School camp for the top 1% students in Class X examination of all School boards would also be popularized and all secondary schools encouraged to participate & compete.

**1.2.4.3** NCSM Innovation hubs will be actively involved in student engagement and long term handholding.

**1.2.5 Participation of Students in Inter-school, State/ National Science and Mathematics competitions/ Olympiads etc.**

**1.2.5.1** Under schemes of the MHRD, schools, students would be encouraged to participate in programmes and events that promote Mathematics and Science awards and incentives for children. The effort would be to take these programmes/events to decentralised levels to ensure greater wider participation and involvement of teachers and children as well as ensure greater & wider participation of children in competitions and awards.

**1.2.5.2** MHRD, NCSM, Nehru Yuvak Kendras & DST will work together to encourage following greater participation of children in the events:

a) Events

- I. National Children Science Congress
- II. Teachers Science Congress
- III. Competitions for Science & Innovation at State/district level

- IV. Maths and Science Olympiads
- V. IRIS Intel Programme
- VI. ISRO Science Competitions

b) Citizen Science Programme

**1.2.5.3** MHRD, NCSM, DST (VP) & Nehru Yuvak Kendras would also collectively work for the following:

1. Formation of Science Clubs in all Schools in phases, in partnership with VigyanPrasar.
2. Subscription/ Membership in Science Clubs/ Circles
3. Encouraging students to write Science communication articles in local media based on self- observation, experience and analysis.

**1.2.6 Organised visits to Science Museums, Innovation hubs and Science fairs and Mathematics Melas**

- Guided student visits to local vocations/ activities involving traditional and modern science and technology viz., Cycle / Car / Road Transport/Rail/Ship yard workshop, Dairy, agriculture, field irrigation system, Bakery, community radio/ TV station, zoo, power stations, telephone exchanges etc; and Science Museums/ Parks/ R&D centres/ Institutions of /Higher Education/ Industry etc.
- Planned visits to Science Museums and Innovation hubs under mentorship of Higher Education Institutions/ UG or PG Students of Engineering or Science / Mathematics students.
- Visits to Science fairs and Mathematics Melas organised locally

**1.2.7 Sensitisation of Parents and Community:** Government will contribute to nurture SMT talent among children through right attitudes through following activities viz.,

- Promotional communication strategy to sensitise parents and society on Science and Mathematics education in an increasingly knowledge based society through mass media.
- Community-Scientist interactions at six monthly intervals using TV, Radio and other technologies.
- Engagement of parents in Classroom teaching at school level.
- Invitation of parents and community leaders in Science and Mathematics events/ activities of schools
- Parent-Science&Math teacher meetings

- Engage Civil Society / NGOs working on Science and Mathematics (selected based on set norms by State/ National level Mentoring Institution) in popularising science and mathematics.

### **Role of State Governments/UTs**

- The State and UT Education Departments under the leadership of State/UT State Project Directors of SSA and RMSA Implementation Societies would be nodal offices for implementation of RAA in the States.
- **State preparedness:** The State/UT Governments would be required to:
  - a. To constitute a State Steering Committee with relevant participation to guide the RAA to maximise its outreach and impact.
  - b. To identify one/group of Nodal Institution (s) for each of the components of RAA.
  - c. To map and identify Higher Education Mentoring Institutions and Schools for networking and tagging.
  - d. Orientation of State Nodal Institutions, Mentoring Institutions, participating Schools and other stakeholders.
  - e. To roll out all initiatives of RAA and monitor progress.
  - f. To coordinate the components and institutes involved.
  - g. To publicise the achievements of the programme.

### **Management Structure**

#### **National Steering Committee (NSC)**

At the National level, a Steering Committee co-chaired by Secretary, Department of School Education & Literacy and Secretary, Department of Higher Education will be setup to work towards the rolling out of the RAA and to monitor, co-ordinate and converge with all stakeholders for Abhiyan activities. The composition of the National Steering Committee would be as follows:

<b>Sr.No.</b>	<b>Member</b>	<b>Position</b>
1	Secretary (SE&L) & Secretary (HE)	Co-Chairs
2	Additional Secretary (SE) & Additional Secretary (TE)	Vice-Chairpersons
3	Joint Secretary (SE-I), MHRD	Member Convener
4	Joint Secretary, DST	Members
5	Joint Secretary, DHE, MHRD (dealing with Technical Institutions)	

6	Joint Secretary (SE.II) MHRD	
7	Joint Secretary, DHE, MHRD (dealing with Central University & UGC)	
8	Director (NCERT)	
9	Vice-Chancellor (NUEPA)	
10	Chairperson, UGC	
11	Chairman, AICTE	
12	Director General, National Council of Science Museums (NCSM)	
13	Director, Nehru Yuva Kendra Sangathan	
14	Commissioner(KVS), Commissioner(NVS), Chairperson (CBSE)	
15	2 State Education Secretaries by rotation	
16	1 Representative of Homi Babha Science Education Centre	
17	1 Representative of Vigyan Parishad, 1 Representative of NCSTC	
18	2 Representatives of Science & Maths popularization organizations	
19	2 Representatives of Industry Associations.	
20	2 Educationists with innovative experience in Science & Maths	
21	2 Popular Science Communicators	

### **Functions of the NSC**

1. To roll out Rashtriya Avishkar Abhiyan through convergence and synergy with other GOI organisations & science popularization programmes.
2. To institutionalise key initiatives of the Abhiyan– School Mentoring by Higher Education Institutions, Promoting teacher circles, promoting Student Science Clubs, Resource Material Development, Advocacy and Monitoring, to achieve the objectives of the Rashtriya Avishkar Abhiyan
3. To monitor the Abhiyan activities state wise once in 6 months and extend required support and take follow up action
4. Coordinate, converge & harmonizing funds under GOI programmes, industry associations and civil society contributions for enhanced outreach of RAA.

The logistical work of the NSC at the Ministry Level will be supported and funded under the SSA – TSG.

### **State Level Steering Committee (SLSC)**



At the State/UT level, SLSC will be chaired by Education Secretary. This committee will monitor and steer the work and activities under RAA. The composition of SLSC will be as follows:

<b>Sr.No.</b>	<b>Members</b>	<b>Position</b>
1	State/UT Education Secretary	Chairperson
2	Director, SCERT/ SISE	Vice-Chairperson
3	Representatives of Secondary/Higher/ Technical Education Depts.	Members
4	Directors, Elementary Education/ Secondary Education	
5	Director, Higher Education	
6	Directors, NCSM Innovation hubs	
7	Lead Mentoring Institutions of the State	
8	2 NGOs active in promotion of SC & Maths	
9	2 Representatives of Industry Associations.	
10	Educationist/ Popular Science Communicator	
11	SPD (RMSA)	
12	SPD (SSA)	

### **Functions of SLSC**

1. To roll out Rashtriya Avishkar Abhiyan (RAA) through convergence and synergy in the State/UT by mobilising adequate funding.
2. To institutionalise the various initiatives of Abhiyan– viz. School Mentoring, Attracting talent, promoting teacher circles, promoting Student Science Clubs, Resource Material Development, Advocacy and Monitoring to achieve the objectives of the Rashtriya Avishkar Abhiyan
3. To monitor the Abhiyan activities once in 3 months and extend required support and take follow up action.
4. Encourage participation of all Govt. & aided schools in RAA and expand coverage of schools systematically with emphasis on equity and inclusion of children of all social, religious, linguistic and economic groups and especially girls with affirmative action. Awards and certification to provide encouragement and improve the self-esteem of motivated teachers.
5. Help and encourage organizations for organizing district and state level competitions, Science and Maths Olympiads etc. Recognition and awards to students, teachers & schools.

## **Funding**

Listed activities/components of Rashtriya Avishkar Abhiyan would be funded under Sarva Shiksha Abhiyan (SSA) and Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and in cases of collaborative initiatives with Ministry of Science and Technology and Department of Higher Education institutions in coordination with their schemes and norms.

## **Milestones for RAA initiatives:**

The milestones for 03 major initiatives under RAA, namely School Mentoring, Teacher Circles on Science/Maths and Science/Mathematics clubs are spanned out for five years from year 2015-16 to 2019-20 as follows:

Year		Coverage of Category of schools to be covered by Mentoring Institutions	Mentoring Institutions	Formation of SC/Maths clubs (in all schools taken up)	Participation in Children's Science Congress	Participation in Maths & Science Olympiads at District/State/National level
1	2	3	4	5	6	
I	2015-16	Pilot Year: 100 Govt. schools	IITs, NITs, Central Institutions, IISERs	-	-	-
II	2016-17	10% of all KV and JNV Schools. 5% Govt. primary/upper primary and secondary/sr. secondary	All Higher Educational Institutions (Central/ State Universities / Colleges under UGC /AICTE	50% of schools selected in column 2	50% of schools selected in column 2	Children from 25% of schools selected in column 2
III	2017-18	25% of all Govt. schools including secondary/sr. secondary schools, elementary/primary schools	Do	”	”	”
IV	2018-19	50% of secondary/sr. secondary schools, elementary/primary schools	Do	”	”	”
V	2019-20	100% secondary & sr. secondary schools, 75% elementary/primary schools	Higher Secondary Schools for Primary Schools	”	”	”

This issues with the approval of the Hon'ble HRM.

**(Anamika Singh)**

**Deputy Secretary to Govt. of India**  
**Department of School Education & Literacy**  
**Ministry of Human Resource Development**  
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**National level Nodal Institutions**

(Consent and approval to be obtained)

1. National Council of Education Research and Training, MHRD (GOI)
2. Homi Bhabha Centre for Science Education, Mumbai, Dept. of Atomic Energy (GOI)
3. National Council of Science Museums (Ministry of Culture)
4. Vigyan Prasar, Dept. of Science & Technology (GOI)
5. National Institute of Science Education and Research, Bhubaneswar under Dept. of Atomic Energy (GOI)
6. Inter-University Centre for Astronomy & Astrophysics, Children's Science Centre, Pune University, Pune. And other Inter-University centres.
7. Indian Institutes of Technology (MHRD)
8. Institute of Mathematical Sciences, Chennai
9. Vikram Sarabhai Community Science Centre, Ahmadabad
10. Indian Institutes of Science Education & Research (IISER)-Bhopal, Kolkata, Mohali, Pune and Thiruvananthapuram,
11. Kerala Shastra Sahitya Parishad and similar organisations.
12. Centre for Science Education, NEHU, Shillong.
13. NE Space Application Centre, Shillong
14. National Council for Science & Technology Communication
15. Association of Mathematics Teachers of India and similar professional organisations.

Role: To provide leadership at National level to plan, implement and monitor one or more of 16 components of RAA.

## 1. Children Science Congress

The method of science is as important as is the science itself. National Council for Science & Technology Communication (NCSTC) popularizes methods of science through National Children Science Congress (NCSC), wherein a focal theme is selected and school children up to 18 years of age, are encouraged to select a sub topic of the focal theme relevant to their environment, propose a hypothesis, construct experimental designs, carry out experiments, collect the data, organize it and make an effort to reach at conclusions or solve the problems through intervention of science & technology.

NCSTC is able to encourage about a million students and thousands of teachers. The scale of encouragement could be gauged by the data of 21<sup>st</sup> NCSC organized by Madhya Pradesh Council for Science & Technology, wherein 183 escort teachers, 77 state coordinators/state academic coordinators, team coordinators, 75 evaluators, 93 resource persons, exhibitors, 10 key resource persons and 300 organizers, volunteers, invites and general public participated.

Technical sessions and poster presentation are the core activities of NCSC. 643 projects from 35 states and Union territories of India including Kendriya Vidyalaya Sangathan and Navoday Vidyalaya Samiti participated. 21 projects from United Arab Emirates (UAE) and 3 projects from ASEAN nations were presented on the theme “Energy: Exposure, Harness and Conserve”. There is no specific budget for the activity. It is supported out of the general budget of NCSTC and costs around **Rs.6 crores** per annum.

If the Ministry of Human Resource Development (MHRD) can collaborate with NCSTC to take this activity to each school in the country, budgetary requirement for manpower, activities, will be in a progression of Rs.20 crores and an increase of around Rs.10 crores each year.

## 2. Promotion of innovation:

The Initiative for Research and Innovation in Science (IRIS) is a successful example of Public Private Partnership which NCSTC is implementing in collaboration with INTEL India. Students upto the age of 18 years are encouraged to develop a research project, select a team and a guide scientist and work on it, across 17 subjects/ categories. It is reviewed by an expert in the area. DST supports IRIS alongwith CII to reach out to the school level, looking for bright researchers among children and high quality research labs to select a guide scientist. The final selection takes place at a national fair wherein the finalists of similar science fairs from NCERT, NCSM and NCSC also participate. The successful students are sponsored to participate in an international fair of Science & Engineering INTEL International at USA. The Indian delegation

performed impressively in the past and has won 13 awards this year with a delegation of 18 students with 12 projects.

The major expenses come from INTEL. Foundation for NCSTC contributes close to about Rs. 50 lakhs per annum to CII or Learning Links the training of teachers and students. To provide exposure in science and technology in the USA is also sponsored which costs around Rs.50 lakhs. If the outreach has to reach more & more schools it will need more enhanced budgetary allocations.

### **3. Teachers Science Congress:**

The NCSTC organizes National Teachers Science Congress every year around a focal theme which last year was “Science education for sustainable development”. 4 regional workshops were organized in the country and around 2500 school teachers were sensitized in research methodology and improved pedagogy for science teaching. 610 papers were received out of which 293 papers were screened in for presentation at the national event.

There is no specific budgetary allocation for the activity but it costs close to Rs.35 lakhs per annum, if the same exercise has to reach to larger & larger groups of teachers, commensurate provisions would need to be made.

### **4. Teachers training programme:**

NCSTC has developed many kits and modules for effective science teaching. Training programmes are organized to make teachers familiar with these kits and modules. Those could be taken up for teacher training, equipping schools and academic support organizations, if need be.