

KPIT



JNANA PRABODHINI'S EDUCATIONAL ACTIVITY RESEARCH CENTRE

IN COLLABORATION WITH

KPIT TECHNOLOGIES



CHHOTE SCIENTISTS

ANNUAL REPORT 2022-2023

Acknowledgement

On behalf of Jnana Prabodhini' EARC department team, we are thankful to KPIT technologies for supporting Chhote Scientists program. Your generous support unable us a valuable addition to the project

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Jnana Prabodhini

A multifarious institution working in the fields of Education, Research, Rural Development, Women Power, Youth Organisation, National Integration and Health, with a view to Motivation Building and Attitude Formation of every person in all age groups to Change the Face of India for Better.

- Established in 1962.
- Spread over five main centres and three sub-centres.
- Has a presence in many districts of Maharashtra.
- Is active in many States including North-Eastern States.
- Works for all sections of society irrespective of caste, creed, sex etc.
- Human-centric approach with emphasis on personal integrity, ethical behaviour, transparency and accountability.

Educational Activity Research Centre

The department, Educational Activity Research Centre (EARC) was established in 1992 as an initiative to spread Jnana Prabodhini's ideas and practices of man-making education across society. EARC works under three domains – Nurturance of Intelligence, Teachers Training, Research, and Resource Development. This center is working for the development of students, teachers, and schools to enrich their educational system.

Chhote Scientists

Jnana Prabodhini, established in 1962, is a multifarious organisation working in the field of Education, Research, Rural Development, Woman Empowerment, leadership development etc. Through its 5 formal schools and several non-formal education centres Prabodhini works towards the goal of “motivating intelligence for social change”.

Science education has been a key area of experimentation and research in Prabodhini during last 3 decades. Many attempts were made for “development of scientific attitude” in high-school students. “Chhote Scientists” is one of the initiatives started a decade ago with the support from KPIT Technologies with following objectives –

- 1) To improve understanding of science concepts through enquiry based learning.
- 2) To provide opportunity to every student to perform hand-on experiments for better understanding of science concepts
- 3) To habituate students to apply knowledge from science books into day-to-day life.

The program focuses on better understanding of concepts through playing with experiments and toys made-up from simple, cheap and readily available materials. Post experiment discussions about the theme makes this program complementary to the school syllabus also.

Jnana Prabodhini and KPIT has jointly conducted these sessions for more than 150000 students from 8th and 9th standard from urban, rural and tribal areas in India

- **An initiative to kindle the basics of science with the help of Easy-to-make and Fun-to-learn scientific toys.**
- **Science popularization through simple hands on experiments and activities complementing respective standard syllabus.**
- **Since 2011, One Lakh students from 150 secondary schools benefitted with the support from 2000 volunteers and mentors.**



Structure of Chhote Scientist for 2022-2023

Model No.	By whom	Where
1.1	Corporate volunteers	Maval,Mulashi
1.2	Jnana Prabodhini Employees- Vidnayn doot	PMC , PCMC , Pune city area
1.3	Science Teachers	States - Assam , Karnataka District - Pune , Tal.- Chipalun
1.4	College Volunteers	Dist.-Jalna
2	Geographical Expansion	Other than Maharashtra - Jharkhand , Nagaland, Rajasthan , Assam , Benglore
3	Expansion through Age group	Skill based module for pre secondary students
4	Expansion with the help of technology	Google classroom

Summary at a glance : 2022-2023

- TOTAL NO. OF **STUDENTS REACHED -63,670**

- TOTAL NO. OF **STATES COVERED- 6**
- MAHARASHTRA , KARNATAKA, ASSAM, NAGALAND, JHARKHAND, RAJASTHAN

- CONTENT DEVELOPMENT -
- **105 ACTIVITIES FROM 12 THEMES FROM PHYSICS , CHEMISTRY AND BIOLOGY**
- **WORKSHEETS**

- **6 SKILLS BASED BOOKLET FOR PRE SECONDARY**

- V SOLVE COMPETITION AT PUNE AND SOLAPUR

- SCIENCE CAMP

Model 1

Model 1 consists of four subunits on the basis of who is conducting the session and in which region. Concepts and activities are the same for both 8th and 9th std students.

Model 1.1 is about Employee Engagement which is carried in schools from Mulshi and Maval Taluka and sessions were conducted by KPIT employees. Jnana Prabodhini's team conducted training workshops for employees and provided a kit for the same. This year after training and practice session team of employees visited 5 schools and conducted sessions of duration 60 min for 8th and 9th standard students.

Model 1.2 is carried out in schools from PMC, PCMC and Pune city area by Jnana Prabodhini's appointed employees called Vidnyan doot. After monthly training of respective themes for 8th and 9th standard vidnyan doot visits allotted schools and conducted session for 8th and 9th standard students of duration 70 min each. This year along with monthly frequency we tried weekly frequency for 2 schools means vidnyan doot visited every week and conducted the session.

Model 1.3 is carried out in schools in Pune in collaboration with Maharshi Karve Stri shikshan sanstha and in Chipalun Tal. and Palghar dist. by teachers from respective schools and institutes. Jnana prabodhini's team conducted training workshops for teachers and provided a kit for the same.

Model 1.4 is carried out in Pune and Jalna districts by college volunteers. Jnana prabodhini's team conducted training workshops for volunteers and provided kit for the same. For this we conducted weekly module for 8th std students and science popularisation module for 6th to 8th std students.

During the year Science camps were conducted for the students from Pune and Sangli Dist. In this three days continuous input group tasks and problem solving tasks , skill based sessions included along with concept wise activity sessions

Training sessions for Model 1

Model 1.1 - Training sessions for KPIT employees were organized as follows. Employees participated in training sessions in both online as well as offline mode. After training practice sessions were conducted at KPIT and then teams visit allocated schools to conduct one hour session at respected schools for 8th and 9th standard students.

Date	Concept	No. of Employees participated
09 September	Pressure	20
04 December	Pressure + Chemistry	8 (Solapur)
06 December	Force and Motion	25
11 January	Sound	23
08 March	Light	20



Model 1.2 - At the beginning of each month, a new science concept i.e. concepts of the month for 8th and 9th std. and activities based on it were learnt by Vidnyan doot as a part of training . An activity or science toy was shortlisted using materials easily available at home or in the surrounding area. Prepare theory discussion related to it, practicing activities and learning skill related to science education , science teaching - learning process was major part of this monthly trainings. 10 Vidnyant doot participated in this program

Date	Concept
June	Skills - Concept Map , Teaching learning tools
July	Pressure , Newton's laws of motion
August	Magnetism , Measurement
September	Chemistry in everyday life
October	Biology in everyday life
December	Sound , Light
January	Simple Machine , Automata
February	V- solve competition - Content , planning



Model 1.3 - This year in collaboration with *Chipalun Vidnyan Adhyapak mandal* we have organised Chhote Scientists program in 40 schools of chipalun dist. From each school one teacher has been participated in the training program for this activity. Post training they conducted the sessions for 8th and 9th std in respective schools. Teacher's covered 4 themes for each 8th and 9th std. Material kit for each theme has been provided to them at the time of training. Similar training is conducted for teachers from *Govardhan Eco Village , Galtare tal.- Wada Dist- Palghar*. After training they have conducted the sessions in schools from nearby area. Along with this at Pune in collaboration with *Maharshi Karve Shikshan sanstha* we have organised this activity in 9 schools of the institute. Total 40 teachers participated in this training workshops through out the year and conducted 6 theme's session in respective schools for 8th and 9th std.

Along with the activities to be conducted , inputs related skills related to science teaching and learning was also part of the training. Experts from respected areas guided the group of teachers during the training.

Date	For whom	Concept	No. of teachers participated
27-28 July	Govardhan Eco Village , Galtare	Pressure , Motion , Chemistry, Observation and Questioning skill	13
27-28 August	Maharshi Karve Shikshan sanstha	Pressure , Motion, Chemistry , Sound	72
23 September	Chipalun Vidnyan Adhyapak mandal	Pressure , Motion, Observation and Questioning skill	40
30 November	Chipalun Vidnyan Adhyapak mandal	Chemistry, Sound	40
01 January	Jnana Prabodhini , Harali	Foldscope	36
04 January	Maharshi Karve Shikshan sanstha	Biology , Light	41

Model 1.4 - This year in collaboration with shikshanganga and JES college Jalna , we worked on volunteer engagement model, where we trained volunteers who are currently studying at colleges and along with study they spend time for training and conducting workshops in different schools. Co ordination with schools at respective places were also done by respective institutes. We provided school kit along with training of respective themes.

Month	For whom	Concept	No. of volunteers participated
April	Shikshanganga Volunteers	Science Popularisation module	11
January	Apoorva Collectives	Pressure , Chemistry , Biology	15
January	Jalna Education Society's college	Science Popularisation module	40
February	Apoorva Collectives	Force and Motion, Light , Sound	17



Science Camp

During academic year 2022-2023 we have conducted science camp at different places with different agendas eg Camp during April 2022 was as a part of closure of Chhote scientist session for annual year , where inputs were given to selected students from schools who was part of this project and content was other than themes and activities conducted during year eg. Laboratory exposure , field visit , skill based inputs etc. For other camps by considering student's requirements we designed a module.

Duration	Time	For whom	No. of students participated
18 to 20 April 2022	9:30 to 12:30 PM	Students of Jnana prabodhini, Navanagar vidyalay	90
26 to 28 April 2022	11 to 4 PM	Students of PMC schools	38
7 to 9 November 2022	9:30 to 1:30 PM	Students for Pune city area schools	45
11 to 12 November 2022	10:30 to 4:30 PM	Students from Sangali and Mhaisal	161
Total			334



V- Solve competition

Every year at the end of the academic year we conducted V- solve competition. The agenda of this competition is to give exposure to the student to work in a group think about the solution of a given problem and make a model as a solution and for this, they must apply whatever they had learned during chhote scientists session.

For this four students from each school are shortlisted. Shortlisting criteria are teacher's nomination and chhote scientist facilitator's anecdotal record about his participation in sessions.

Summary at a Glance

Total No. of **Schools** Participated – **56** (PCMC + PMC + Pune City + Maval- Mulshi + Velhe – Panshet)

Total No. of **Students** Participated- **227**

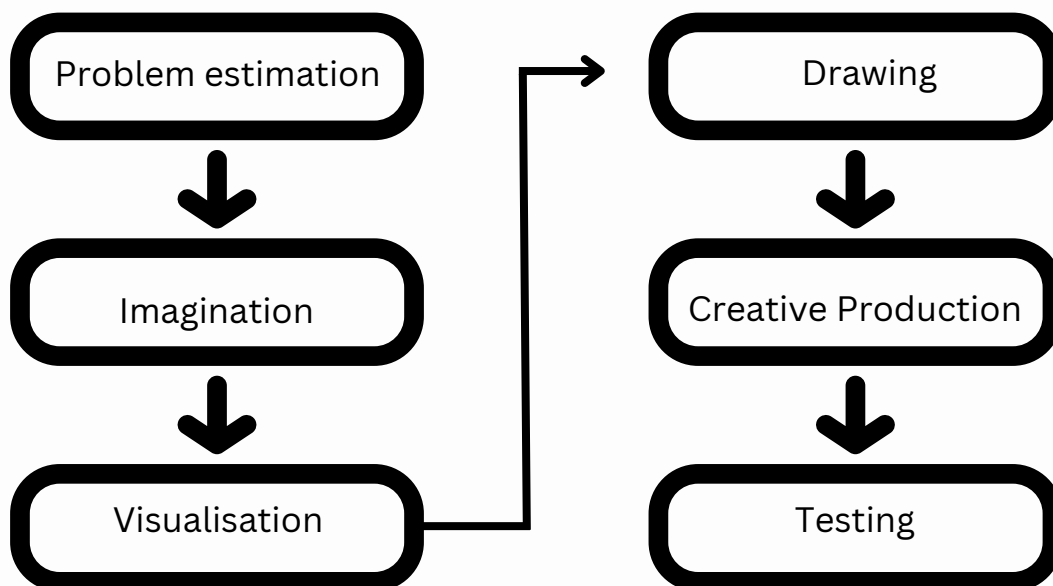
Total No. of **Teachers** Participated- **43**

Total No. of **Evaluators**- **20** (EARC Department + Pune Prashala + JP Navanagar Vidyalay +Yuvak Vibhag Vidnyan Dal+ KPIT Employee)

Total No. of **Department Members**- **22**

Other Members- 6 (Shikshanganga – 2 + Yuvati vibhag Vidnyan dal -2 + Solapur Jp – 2)

Total No. of **KPIT Volunteers** - **30**



Total 56 schools are divided in three groups A B C - schools in group A are PMC and pune city area school where we conducted chhote scientist sessions through out year. Schools in group B are from rural area where we had introductory sessions. Schools in group C are from PCMC area.

One day competition is divided into three Levels.

Level 1 is of 15 min duration, where task given to groups is Enlist variety of maximum alternative uses of.... Group A - Paper , Group B - Umbrella , Group C - Glass. The objective behind this task is students should apply method of brainstorming , imagination and creative thinking and hence the evaluation criteria were - total number of uses , variety of uses and unique uses. Team of Evaluators evaluated allotted schools on given criteria.

Level 2 is of 30 min duration, where task given to groups are as follows-

1. Find out area and Centre of gravity of given map

Group A - Maharashtra , Group B - Pune , Group C - India

The objective behind this task is student should apply knowledge of exploration , and application of concepts learnt during chhote scientist session

Level 3 is of 90 min duration, where problem statements were given to students and evaluation was based on process and final product.

Objectives behind this task is students should be able to Identify and analyze the given problem, should be able to work in team to solve the given problem creatively and select appropriate material after visualizing probable solutions for the same.

Level 3

Group A

Science subject was taught through a workshop to the 8th and 9th grade children of a school. Selected children participated in it with great enthusiasm. In today's session, there was a session to create models using different materials like wood, paper, ropes, cardboard etc. The session went very well, the teachers also appreciated the models done by the children. All this was done, but while doing this, a lot of waste was created on the floor and on the table in the classroom. Waste includes small pieces of paper, wood, threads, and even dust, etc. Of course, there was a rule that the place must be cleaned when the work is done. So now they took dustpan (*supali*) to fill the garbage. The broom was not seen anywhere around. They did a bit of searching but could not find anything. So now no broom, no other electronic device is available but cleaning is must.

While thinking about what to do, a group of children from the other class came there after finishing their Chhote scientists session and were still wondering why the previous children didn't come out yet. After some discussion some of them find out exact problem of the children present for workshop. After looking at some of the things nearby in the room along with dustpan (*Supali*), the children came up with modified version of dustpan (*Supali*) which itself cleans the garbage without using broom and without touching the garbage by hands. What would they have done?

Find out the solution for the same problem using available material.

Level 3

Group B

Shweta's mother feels that she cannot even prepare a cup of tea. She had scolded Shweta for the same. Shweta can make tea and she needs to prove this to her mother. Her house is on first floor and her parents are sitting in the backyard garden. No one else is at home. She has prepared a tea. But she is afraid that if she climbed down the stairs to take the tea down her mother will feel that she has bought tea from outside. So, she is thinking about taking cup of tea downstairs being in the house herself. She could not find any long enough rope or similar object in the house. At that time, she saw, in a television program, the scene in which a few para troopers were jumping from the aeroplane. She thought on similar lines for the cup of tea. Its obvious that she doesn't want any tea to spill over after reaching down.

What will you do to take a cup of tea downstairs if you would have been in Shweta's place?

Level 3 **Group C**

Raghav is a student like you. He likes to create different types of artworks. Once while preparing a craft, the pins, stapler pins and nails accidentally fell from his hand. All the pins and nails were scattered all over the house, some under the bed, some behind the cupboard, some fell out of the window. He is now afraid that, by looking at this mess mother will shout. He was sitting on his study chair thinking now, it will take a few minutes for mother to come back, before that he has to cover all this mess. i.e.

1. Dropped pins and nails are to be picked up.
2. Pins and nails are to be removed from under the bed where hands cannot reach. He could not find a broom in the house too.
3. Raghav wants to pick up all the pins and keep them in a box without touching them.

Now you must help Raghav. What will you do?

पाठकी १ **गट B**

चित्रातील वस्तू - उघडी - नव्हतनाणी वाढीची आवडती असेल. पावसाळ्यामध्ये पावसापासून संरक्षण करण्यासाठी साधारणपणे तोंडा वरून होतोच. त्याशिवाय इतर का उपयोग करून का काढताही करता येऊ शकते? उदाहरणांनी सादरना आपण म्हणून

छत्रीच्या अशा वेगवेगळ्या वास्तूत वास्तूत उपयोगाची यादी करा.

Level 1

Umbrella - one of our childhood favourites. Normally we use it for protecting ourself from rain. Can we think of other uses of Umbrella?

e.g., Using it as a support while walking

Enlist variety of maximum such uses of umbrella.

Chhote Scientists: V Solve Competition 2022-2023

पाठकी १ **गट C**

चित्रातील वस्तू - पेटल. असेही रोज असायला लागतोच अशी एक गोष्ट आहे. असा पेट्यातून आपण पाणी पिता. त्या शिवाय पेट्याचा उपयोग अजून का काढताही करता येऊ शकते? उदाहरणांनी अंदाज करताना याची व्याख्या करा. अशा वेगवेगळ्या वास्तूत वास्तूत उपयोगाची यादी करा.

Level 1

The object in the picture - a glass - is something that we need every day. We drink water from such a glass. Apart from that, what else can the glass be used for?

e.g., using it as a container while bathing

Enlist the variety of maximum such uses of glass.

Chhote Scientists: V Solve Competition 2022-2023

पाठकी १ **गट A**

कागद रोजच वापरला जातो. अभ्यास करताना वहीमध्ये असल्याला कागदावरच आपण लिहित असतो. त्या शिवाय कागदाचा उपयोग अजून का काढताही करता येऊ शकतो? उदाहरणांनी कागदाचा वापर पिसाची बनवण्यासाठी होतो. कागदाच्या अशा वेगवेगळ्या वास्तूत वास्तूत उपयोगाची यादी करा.

Level 1

Paper is used every day. While studying, we write only on the paper that is in the notebook. Apart from that, what else can paper be used for?

For example, Paper is used to make bags

Enlist the variety of maximum such uses of paper.

After all three levels, team of evaluators prepared overall result of the competition and we declared winners in each section. Meanwhile students were Introduced to KPIT company by one of the senior employee. Interactive session for teachers was also arranged at the venue. Mr. Sunil Magar sir (Retd. director SCERT) guided the group of teachers.



Good afternoon all, Here, I would like to express gratitude towards the whole team of chhote scientists for the arrangements of V solve competition. I would like to appreciate the changes made this year in rounds, gifts given to students, frame and book given to school and session arranged for teachers. Your efforts always encourage us for the activity based learning teaching. Every year, we teachers always learn something new. Thank you so much for the opportunity. 🙏 🙏 🙏 Nikita KVEMS, Narhe

Summary at a Glance @ Solapur

Total No. of **Schools** Participated – 12

Total No. of **Students** Participated- **60**

Total No. of **Teachers** Participated- **12**

Total No. of **Volunteers + Evaluators- 10** (EARC Department + JP Solapur)



V solve competition at Solapur -24 February 2023 - As we have conducted chhote scientist activity in Solapur also, 12 schools participated in this competition . We have arranged activity based session for teachers at the venue

Winner schools at respective places are as follows -

Prize	School Name
First	Suravase High School
Second	Bal Vikas Mandir Prashala
Third	Ramdas Yallappa Manekari High School
Consolation -I	Sharadchandra Pawar High School

Solapur

Pune

Group A	
Prize	School Name
First	Vision English Medium School, Narhe
Second	Khashaba Jadhav
Third	M.S. Golwalkar Guruji Vidyalay
Consolation -I	Hutanta Balwir Shirishkumar Madhyamik Vidyalay
Consolation -II	Vishvakarma Vidyalay

Group B	
Prize	School Name
First	Raje Shivchhatrapati vidyalay , Sonde Mathana
Second	Veer Baji Pasalkar, Kandgao
Third	Sonabai Dedge vidyalay , Rule
Consolation -I	Torana Vidyalay , Velhe
Consolation -II	MKSS - Kamshet

Group C	
Prize	School Name
First	Pradnya Vikas Centre – Hadapsar
Second	Madhyamik Vidyalay, Kasarwadi
Third	Pradnya Vikas Centre- Keshavnagar
Consolation -I	Madhyamk Vidyalay , Wakad
Consolation -II	Madhyamik Vidyalay , Shramiknagar

Pune

Summary of Model 1

Model No.	Place/Institute	Total No. of schools	Std.	By whom	No. of students participated	No. of hours per student	Total input hours.
1.1	Maval-Mulshi	5	8	KPIT Employees	308	7	2156
		5	9		279	7	1953
1.2	PMC	10	8	Vidnyan doot	529	7	3706
		10	9		573	7	4015
	PCMC	18	8		786	7	5502
		18	9		683	7	4781
	Solapur	14	8		530	7	3710
		14	9		528	7	3696
	Pune Area	3	8		191	7	1337
		2	9		97	7	679
	Slum areas near Pune	5	8		103	2	206
	Velhe, Panshet area	10	9		428	1.5	642
1.3	Chipalun-Ratnagiri Dist.	40	8	Teachers	415	5	2075
		40	9		334	5	1670
	Karve Stri Shikshan Sanstha	9	8		1011	7	7077
		9	9		1097	7	7679
	Wada - Iskcon - Palghar	13	8		120	3.5	420
1.4	Jalana	15	8, 9	JES college volunteers	651	3	1953
	Pune city area	2	5 to 7	Ferguson college volunteers	440	2	880
	Pune city area	2	8	Shikshan ganga-AC volunteers	150	7	1050
	Hadapsar area-Pune	10	6 to 8	Annasaheb Magar college volunteers	1363	2	2726
Total	254			10616		57911	

Model 2

Chhote Scientists project was initially offered in Maharashtra, the EARC department aimed to extend its reach to other states across India, including Assam, Nagaland, Jharkhand, Rajasthan, and Karnataka. To achieve this goal, the EARC collaborated with local educational institutions and offered online and in-person teacher training programs titled "Inquiry-based concept enrichment teaching-learning practices through Chhote Scientists activities". As a result of these training programs, Chhote Scientists was introduced as a regular academic activity in various schools. To reach remote areas, the EARC worked with social organizations, with *Vidnya Doot* from EARC working with local volunteers in workshop form to deliver the program.

Following table reflects summary of sessions in different states

Sr. No.	State	By whom	Institute	Std.	No. of hours per student	No. of students participated	Total input hours
1	Rajasthan	Vidnyan Doot	Vanawasi Kalyan Ashram	7 th to 9 th	3	329	987
2	Nagaland			8 th and 9 th	7	50	350
				7 th to 10 th	3	113	339
3	Jharkhand			8 th to 10 th	7	660	4620
				5 th to 7 th	3	270	810
4	Karnataka	Teachers	Rashtrrothhan	8 th and 9 th	4	2777	11108
5	Assam		Vivekananda Kendra Shiksha Prasar Vibhag	8 th and 9 th	2	2430	4860
6	Karnataka	College Volunteers	Youth For Seva	8 th	4	2754	11016
	Total					9383	34090

Model 3

This year Chhote Scientists has launched the module for pre secondary students as a base or foundation for science learning. To make secondary students ready to explore science there is a need to prepare the pre secondary students. Following the principles of Chhote Scientists like hands on approach, easy to get material, individual participation the module was designed in such a way that it focuses on the skills to learn science. The module is structured in three levels irrespective of standards. This was the first, pilot year of the module in which all 5th-7th standard students were considered as first level. The skills taken into consideration are Observation skill, questioning skill, measurement skill, Classification skill and Experiment Design. To study these skills a subject environmental studies was chosen so that it is connected to the curriculum. In this way 6 booklets were made to conduct an activity based session of 50-60 minutes.

There is a collaboration with Jankalyan samiti. The MoU was signed in the month of August 2022. Jankalyan samiti works in three regions namely Western Maharashtra, Devgiri and Konkan. There are 19 teachers (project head) all over Maharashtra. Each one has 20-22 schools out of total 350 schools.

The sessions are conducted by Vidnyandoot, Organizational collaborations, and with the help of volunteers.

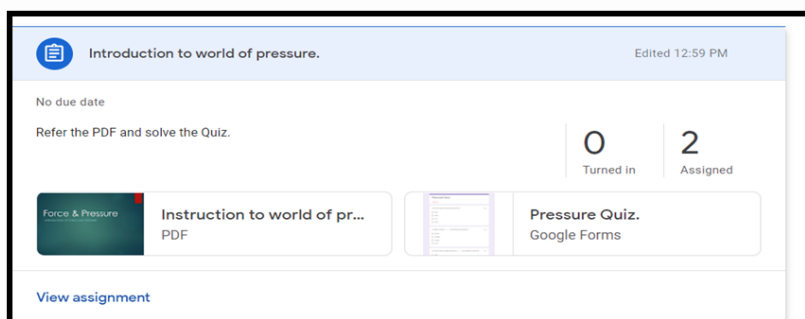
Sr. No.	Place/ Institute	Total No. of Schools	No. of students participated	Total no. of sessions in a year	Total input hours
1	Janakalyan Samiti	348	30000	6	180000
2	Jp-Dombiwali Kendra	6	279	2	558
3	Karve Stri Shikshan Sanstha	12	10246	6	61476
4	Chipalun	41	1360	3	4080
5	PMC, PCMC area	9	343	6	2058
6	Melghat Mitra	1	60	3	180
7	Jp- Harali Kendra	7	112	3	336
8	Solapur Prashala	1	120	3	360
9	Panshet	13	40	1	40
10	Jp-Nigdi Kendra	1	60	1	60
11	Wadaki area - Pune	3	167	3	501
12	Assam	20	550	2	1100
	Total	462	43337		250749

Model 4

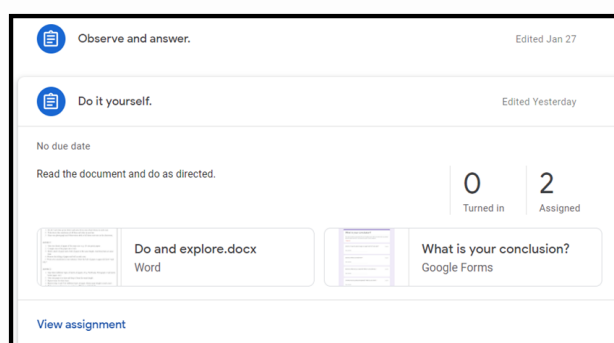
During this year, under model 4, pilot work on course-based learning is done where we tested course with experts and sample of students tried the course and gave feedback.

The agenda behind this course is, that students should understand the concept from all aspects i.e. knowledge, skill, and application point of view. The course includes the following four types of tasks.

1. Scientist story : read and answer the questions from google form. For this task we preferred India scientist.
2. Read Power point presentation and answer the questions. Power point presentation contains basic information and daily life application related concepts.
3. Watch video and answer the questions which aims at applying observation skill.
4. Read the instructions and perform the activity as directed which is for perform the activity or do it yourself



Content of one classroom based on one concept



Content Development

This year content development was done by following steps. Modification of existing content and addition of new themes new tools like card games in biology , supporting videos etc. was done by the team of *Vidnyan doot*

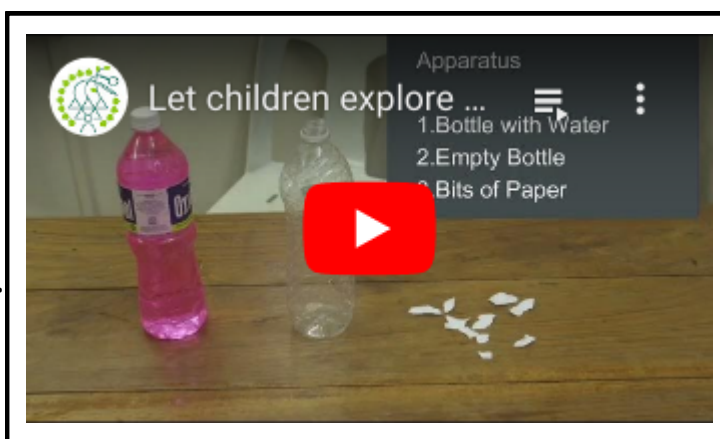
1. Syllabus analysis -
Analysis of syllabus of state board and NCERT syllabus was done for standard 6th to 9th by referring related authorized text books

UNIT VI	UNIT VII	UNIT VIII	UNIT IX	UNIT X
<p>1. Natural resources (Air, water, land)</p> <p>13. Natural resources 13.1 Air 13.1.1 Water 13.1.2 Land 13.1.3 The process of soil formation</p>	<p>2. The living world: Adaptation and classification</p> <p>14. Adaptation in animals 14.1 Adaptation in animals: Survival and reproduction 14.2 Adaptation in animals: Survival and reproduction 14.3 Adaptation in animals: Survival and reproduction 14.4 Adaptation in animals: Survival and reproduction 14.5 Adaptation in animals: Survival and reproduction 14.6 Adaptation in animals: Survival and reproduction 14.7 Adaptation in animals: Survival and reproduction 14.8 Adaptation in animals: Survival and reproduction 14.9 Adaptation in animals: Survival and reproduction 14.10 Adaptation in animals: Survival and reproduction</p>	<p>3. The living world: Adaptation and classification</p> <p>15. Adaptation in animals 15.1 Adaptation in animals: Survival and reproduction 15.2 Adaptation in animals: Survival and reproduction 15.3 Adaptation in animals: Survival and reproduction 15.4 Adaptation in animals: Survival and reproduction 15.5 Adaptation in animals: Survival and reproduction 15.6 Adaptation in animals: Survival and reproduction 15.7 Adaptation in animals: Survival and reproduction 15.8 Adaptation in animals: Survival and reproduction 15.9 Adaptation in animals: Survival and reproduction 15.10 Adaptation in animals: Survival and reproduction</p>	<p>4. Living world and classification</p> <p>16. Living world and classification 16.1 Living world and classification 16.2 Living world and classification 16.3 Living world and classification 16.4 Living world and classification 16.5 Living world and classification 16.6 Living world and classification 16.7 Living world and classification 16.8 Living world and classification 16.9 Living world and classification 16.10 Living world and classification</p>	<p>5. Living world and classification</p> <p>17. Living world and classification 17.1 Living world and classification 17.2 Living world and classification 17.3 Living world and classification 17.4 Living world and classification 17.5 Living world and classification 17.6 Living world and classification 17.7 Living world and classification 17.8 Living world and classification 17.9 Living world and classification 17.10 Living world and classification</p>

2. Activity Bank- Theme wise activity bank was prepared by referring and analyzing different activity books and online available content. Before writing activity in defined format team of *vidnyan doot* performed the activity and had discussion about it.

Sr. No.	Activity	Theme	Concept
1	Dehydrating sindoor	Chemistry in everyday life	Reversible change
2	Heating sugar		Physical and chemical change
3	Chromatography		Separating mixture
4	Invisible letters using lemon		Chemical reaction
5	Invisible letters using washing powder		Acid Base
6	Heat water in paper cup		Convection of heat - specific heat
7	Fireproof balloon		Heat transfer
8	Identify acid and base with the help of chemical indicators		Acid Base- chemical indicators
9	Identify acid and base with the help of Litmus paper		Acid Base- Litmus test
10	Identify acid and base with the help of Natural indicator		Acid Base- natural indicator
11	Making of natural indicators using hibiscus petal and red cabbage		Natural indicator
12	Neutralisation	Biology in everyday life	Neutralisation
13	Detection of water in milk		Adulteration in food
14	Detection of detergent in milk		Adulteration in food
15	Detection of chalk powder in puffs sugar		Adulteration in food
16	Detection of Foreign resin in asafoetida (hing)		Adulteration in food
17	Differentiation of Common salt and iodised salt		Adulteration in food
18	Adulteration in tea		Adulteration in food
19	Leaf classification		Structure of leaf
20	Inflatable lungs		Respiratory system
21	Seed dissection		Study of seeds
22	Parts of plants - twig		Parts of flowering plant
23	Monocot-dicot game		Grouping of plant
24	Blooming paper flower		Capillary action
25	DNA model		DNA- structure and function
26	Flower dissection		Study of floral parts
27	Adaptation of whale		Adaptation
28	Plant cell- animal cell game		Cell structure - plant and animal

3. Video Bank - Procedure videos are available for trainers which they can refer after training workshop as a part of preparation before conducting sessions in schools. Private playlist of all activities is available on youtube channel for reference



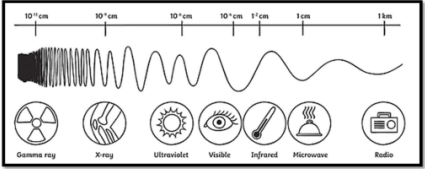
4. Worksheets - This year we designed worksheets for students which they can use as a notes for respective session. We have given some basic information about the concept at the beginning and then activity wise some points to note down , some points about concepts discussed during session etc.

छोटे सायंटिस्ट्स (Chhote Scientists)
विज्ञान संकल्पना - प्रकाश (Light)
 इयसा - ९ वी
 कार्यपत्रक - ५

विद्यार्थ्यांचे नाव - _____
 शाळेचे नाव - _____


हे तुम्हाला माहित आहे का ? (Do you know that?)

- ✓ प्रकाशाचे उत्सर्जन करणारा पदार्थ म्हणजे प्रकाशाचे स्रोत होय. (A light emitting substance is a source of light.)
- ✓ कोणतीही वस्तुदिसण्यासाठी तिच्या पृष्ठभागावरून प्रकाशाचे परावर्तन होणे आवश्यक असते. (For any object to be visible, light must be reflected from its surface.)
- ✓ प्रकाश स्रोताच्या मार्गामध्ये अपारदर्शक वस्तू आली तर त्यातून प्रकाश आरंभ जात नाही, त्यामुळे वस्तूपलीकडे असलेल्या भिंतीवर किंवा इतर पृष्ठभागावर वस्तूची सावली पडते. या सावलीलाच त्या वस्तूची छाया म्हणतात. (If an opaque object is in the path of the light source, light cannot pass through it, so the object casts a shadow on a wall or other surface beyond the object.)
- ✓ प्रकाशाचा इलेक्ट्रोमॅग्नेटिक स्पेक्ट्रम (Electromagnetic spectrum of light)

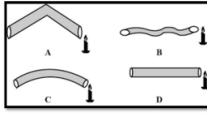


तासाच्या वेळीस नोंदवायचे मुद्दे

अनु क्र.	दोन आरख्यामधील कोन (°)	एकूण प्रतिमा
1	180	
2	120	
3	90	
4		
5		0
6		2.5



Q.1 कोणत्या पाईप मधून आपल्याला मेणवतीची च्योत दिसते? आणि का (From which pipe we can see the candle flame and why?)



Q.2 प्रकाश स्रोतापासून वस्तूवर पडणारी प्रकाश किरणे वस्तूच्या पृष्ठभागापासून परत फिरतात. याला _____ म्हणतात (Light rays falling on an object from a light source bounce back from the surface of the object. This is called _____)

A) अपवर्तन (Refraction) B) परावर्तन (Reflection) C) विकिरण (scattering) D) अपसरण (Dispersion)

Q.3 सपाट व नुळुळीत पृष्ठभागावरून होणाऱ्या प्रकाशाच्या परावर्तनाला _____ म्हणतात.

A) प्रकाशाचे अनियमित परावर्तन (Irregular reflection of light)
 B) प्रकाशाचे नियमित परावर्तन (Regular reflection of light)

Q.4 फोटो काढताना प्रकाशाचा स्रोत वस्तूच्या/ व्यक्तीच्या समोर पाडजे का मागे? (Should light be in front of or behind for photo)

Q.5 उन्हाळ्यात हलक्या रंगाचे कपडे आणि हिवाळ्यात गडद रंगाचे कपडे का घालतात? (Why do we wear light colored clothes in summer and dark colored clothes in winter?)

Q.6 किती प्रकारचे आरसे आपण वापरतो? त्यांची नावे लिहा आणि ते कोठे वापरतात ते लिहा. (How many types of mirrors do we use? Write their names and where they are used.)

5. Session Plan - After training workshop we shared session plan, in which information about activities to be conducted in available time, way of conducting activity - i.e. Individual / Group / Demonstration and material required for each activity is shared for reference.

Sr. No.	Name of Activity	Individual / Group of 4 or 5 students /Demo	Concept	Material - For 10 groups / For 50 students
1	Leaf classification	Group	Different types of leaves	Different types of leaves from surrounding , Per group 4/5 types
2	Inflatable lungs	Group	Working of lungs	Small plastic bottle-10, Small balloon -20 , Handglove-10 , Bend straw-20 , Cutter -10, rubber band-20, Cellotape-10
3	Seed dissection	Individual	Types of seed	Soaked seeds -150 (Monocot+dicot) , Needle/Pins -25
4	Study of stem and root	Demo	Parts of plants	Plant twig -1
5	Game - Dicot, monocot	Group	Dicot and Monocot	Card set - 10
6	Video- Seed germination	Demo	Germination of seed	https://youtu.be/w77zPAfVTuI

Annexure-I

Activity List

Concept wise activities for 8th std

Sr. no.	Concept	Activities
1	Pressure	1.1 Needle through the Balloon 1.2 Paper stays dry in water 1.3 Balloon in the bottle 1.4 Why base of dam is broader? 1.5 Air resists at surface 1.6 Levitating strip
2	Magnetism	2.1 Magnetize a needle 2.2 Which is Magnet 2.3 Move along magnetic lines 2.4 Making electromagnet 2.5 Magnetic Levitation
3	Acid and Base	3.1 Static Heating sugar 3.2 Invisible letters using detergent 3.3 Identify acid and base with the help of Litmus paper 3.4 Neutralization using chemicals 3.5 Detection of detergent in Milk
4	Biology	4.1 Leaf Classification 4.2 Inflatable lungs 4.3 Seed dissection 4.4 Parts of plants 4.5 Card game - Monocot, dicot 4.6 Video - Seed Germination
5	Sound	5.1 Listen through meter scale 5.2 Roaring cup 5.3 Wave model 5.4 String telephone 5.5 Simple mouth organ
6	Simple Machine	6.1 Game - Example of first class lever 6.2 Board knife 6.3 Chopstick 6.4 Simple pulley 6.5 Complex pulley

Concept wise activities for 9th std

Sr. no.	Concept	Activities
1	Laws of Motion	1.1 Coin in a cup 1.2 Ball in a bucket 1.3 Marble race 1.4 Striking wooden block 1.5 Balloon Rocket
2	Measurement	2.1 Does water push up 2.2 Cartesian diver 2.3 How many drops 2.4 Find the Centre of gravity 2.5 Which holds more
3	Acid and Base	3.1 Dehydrating sindoor 3.2 Chromatography 3.3 Invisible letters using lemon 3.4 Heat water in paper cup 3.5 Identify acid and base with the help of chemical indicators 3.6 Detection of water in milk
4	Biology	4.1 Blooming paper flower 4.2 DNA model 4.3 Flower dissection 4.4 Adaptation in whale 4.5 Game-Plant cell 4.6 Video - Pollination
5	Light	5.1 Ice breakers - Magnification and reflection 5.2 Parrot in a cage 5.3 Broken pencil 5.4 Multiple images 5.5 Laser in water
6	Automata	6.1 Model of wiper 6.2 Boy doing drilling 6.3 Model of snake catching rat

Activities for Science Popularisation Module

Sr. no.	Concept	Activities
1	Centrifugal Force	1.1 Tornado 1.2 Water sprinkler 1.3 Lifting Heavier objects 1.4 Straw sprinkler
2	Pressure	2.1 Balloon in the bottle 2.2 Bernoulli bag 2.3 Needle through Balloon
3	Light	3.1 Laser in Water 3.2 Parrot in cage
4	Motion	4.1 Balloon rocket
5	Sound	5.1 Straw flute 5.2 Roaring cup 5.3 Wave Model
6	Acid- Base	6.1 Invisible letters using detergent powder
7	Biology	7.1 Card game - Monocot , Dicot

Activities for Pre- Secondary Module

Sr. No.	Theme	Concepts covered with the help of activities
1	Questioning Skill	1.1 Types of Questions 1.2 Information gained from questions 1.3 Sequence of questions 1.4 Frame the questions using Picture, Paragraph , Sentence , word
2	Observation skill	2.1 observations using sensory organs 2.2 Observing things and pictures 2.3 Observing Graphs
3	Environmental Science	3.1 Living - Non living 3.2 Natural - Manmade 3.3 Food chain 3.4 Diversity - Plants and Animals
4	Classification Skill	4.1 Features 4.2 Criteria 4.3 Similarities and differences
5	Measurement skills	5.1 Need of measurement 5.2 Use of standardized tools 5.3 Approximate measurement
6	Experiment design	6.1 Introduction to apparatus 6.2 To draw diagram as per description 6.3 To determine order of action 6.4 Writing an experiment 6.5 Identify the purpose - Write a conclusion 6.6 Do as directed

Annexure-II

Photographs



Sessions in Schools



Sessions in Schools at Jharkhand



Teacher's Training



Sessions in school - Pre secondary model