

ESG Mid-Year Report: April – Sept 2016

Summary

About Exciting Science Group:

The Exciting Science Group comprises of scientists from two of Pune's best research institutions, NCL and IISER-Pune. This initiative is aimed at conveying the excitement of science and technology to school students. The motivation behind our programme is to attract the brightest talent from the next generation towards careers in science and technology, since it will be these students who will drive tomorrow's science and innovation based economy.

Popular Talks: Held once a month (on the last Sunday) these talks give students a chance to meet scientists and understand the relevance of their work to society. Typically, these talks are filled with live demonstrations and experiments conducted by scientists – so as to kindle a sense of wonderment in the students.

Summer Workshops:

Three Day Workshop on "Assessing Environmental Change Using Satellite Data" using GRASS Geographic Information Systems (GIS) software was held in May 2016 for students between the ages of 12-14 years to introduce the tools and techniques to assess environmental changes using remotely sensed data from satellites. 18 students from 17 schools participated in the workshop, including 5 students from 3 PMC schools.

Five Day Workshop on "Having Fun with Scratch Programming" targeted at children between the ages 8 – 10 were conducted in May 2016. The workshop was intended to introduce kids to the fundamentals of Scratch, a graphical programming interface developed by the Media Lab – MIT. 29 students from 27 schools participated in the workshop, including 5 students from 3 PMC schools.

Three Day Workshop on "Raspberry Pi" was conducted in May 2016 for PMC students from grade 7 and 8. The workshop aimed to introduce coding on Raspberry Pi, a credit card size computer originally developed for learning basic computer science. It is versatile and useful platform for learning different domains of STEM [Science, Technology, Engineering, & Maths] education. 26 students from 3 PMC schools participated in the workshop.

Half-Day Workshop on "Science Club Training" was organized by ESG in collaboration with GREAT Foundation to take the idea of the science club programme that we have developed over the years and provide training for this to be replicated by teachers in schools. 12 Teachers from 9 PMC schools and 36 corporate volunteers participated in the workshop.

3 PMC students also participated in a weekly Math gaming workshop organized by Tinkering lab at Venture Center between April-June 2016. This workshop aimed at improving logical, analytical and strategic thinking in children by playing games that use mathematical principles and strategies.

Summer Internship Programme: This is a programme of the Exciting Science Group, to get a few students from Pune Municipal Corporation schools to spend a summer in NCL/IISER labs. The internship provides an opportunity for students to work with mentor scientists and PhD students and experience what it means to work in a research laboratory. The internship lasted for two months with the students spending the entire working week at the labs.

Science and Art Competition: The second edition of the Science and Art Competition was organized in two phases:

The first phase was organized in June for PMC school students of class 8 and 9 to motivate them to understand the correlation between science and art. 102 students from 8 PMC schools participated in the competition.

The second phase was organized in July for city based schools. 160 students from 40 schools across the city participated in this competition.

Talks at PMC magnet schools: Scientists (from NCL and IISER-P) visit three schools once a month between August to March, and deliver a talk (typically on topics from school textbooks), conduct experiments, and interact with the kids: K.C.Thackeray Vidyaniketan, Near Daruwala Pul; Hutatma Balvir Shirishkumar Vidyalaya, opposite Police lines, and Dr Vasantdada Patil Vidyaniketan, Shukrawar Peth. At the end of the talks, students are given small gift (such as a book, or a science kit that we specially put together) that typically relates to the topic discussed. The students are also provided a snack at the end of the talk.

Science Clubs: From the last four years, we have also extended our activities by initiating a weekly “Science Club” programme at two underprivileged schools (K.C.Thackeray Vidyaniketan and Hutatma Balveer Shirishkumar Vidyalaya). From the year 2015, we have expanded the science club activity at Dr Vasantdada Patil PMC Vidyaniketan, Shukrawar Peth. ESG volunteers conduct weekly science club sessions at the three PMC VidyaNiketan schools. The science clubs sessions this year began from August.

We would like to acknowledge the generous support for this activity from CSIR-NCL, IISER-Pune, the Venture Center, the Forbes Marshall Foundation, the Persistent Foundation, the Praj Foundation, and the Nag Foundation.



Popular Talks

What: This series of once-a-month talks aims to connect school students to practicing scientists. Thus, school students get to hear a firsthand account of what it means to do research, and to get a feel for the thrill of discovery. The speakers do not attempt to teach science to the students – rather, the idea is to create a sense of “wow” and to kindle the students’ curiosity. The talks are not meant to be pedantic lectures, but combine live demonstrations, experiments and problem solving exercises to involve the students and engage their attention.

When & Where: The Popular Talks are held once a month at 10 am on Sunday mornings at the NCL Innovation Park, Pashan. The talks are free and open to students and science teachers. Registration is on a first-come-first-served basis, and is done by sending email to register@excitingscience.org or through our web site: <http://www.excitingscience.org>.

Date	Speaker	What was the talk about?	No of participants
24 April 2016	Dr Rajnish Kumar	“Getting Familiar with Gas Hydrates”	55
29 May 2016	Dr Sayan Bagchi	“Atoms, Molecules and Light”	74
19 June 2016	Dr Janardan Kundu	“ Science and Technology in Everyday Life”	125
16 July 2016	Dr Sayam Gupta	“The Art and Science of Color”	180
28 Aug 2016	Prof Chandrasheel Bhagwat	“Fun with Numbers”	130
25 Sept 2016	Prof Saurabh Dube	“The Smallest pieces of our universe”	90
23 Oct 2016 (scheduled)	Prof Shyam Rai	“How Earth’s Climate is linked to its internal working?”	-

Photographs from the talks:



Talk on “Getting Familiar with Gas Hydrates” by Dr Rajnish Kumar, CSIR-NCL, Pune



Talk on “Atoms, Molecules and Light” by Dr Sayan Bagchi, CSIR-NCL, Pune



Talk on “The Art and Science of Color” by Dr Sayam Sengupta, CSIR-NCL, Pune



Talk on “Fun with Numbers” by Prof Chandrasheel Bhagwat, IISER-Pune



Talk on “The smallest pieces of Our Universe” by Prof Sourabh Dube , IISER-Pune

What did the students who attended these talks say?

"Very nice talk. Could be understood really well."

"I think the talk is very interesting and it needs no any kind of suggestion. It's a very good talk I attended ever. The speaker is also experienced and I understand very well."

"I enjoyed very much."

"I would like the topic of astrophysics/quantum mechanics to be covered."

"It was an interesting session. I liked the way the topic was explained and presented."

"It has been good. Looking forward to come for another talk."

"The topic taken in the seminar was interesting. It took me to the world of chemistry."

Talk at PMC Magnet Schools

What:

Scientists (from NCL and IISER-P) visited three PMC magnet schools once a month, and delivered a talk (typically on topics from school textbooks), and interacted with the kids. At the end of the talks, students are given small gift (such as a book, or a science kit that we specially put together) that typically relates to the topic discussed. The students are also provided a snack at the end of the talk.

These talks happen during the science club and as a part of these talks we enable school students from these PMC schools to directly interact with NCL scientists and IISER-P faculty.

Schools covered:

- **K C Thackeray Vidyaniketan, Near Daruwala Pul, Shaniwarvada**
- **Hutatma Balvir Shirishkumar Vidyalyaya, Opp Police lines, Shivaji Nagar**
- **Dr Vasantdada Patil Vidyaniketan, Shaniwar Peth**

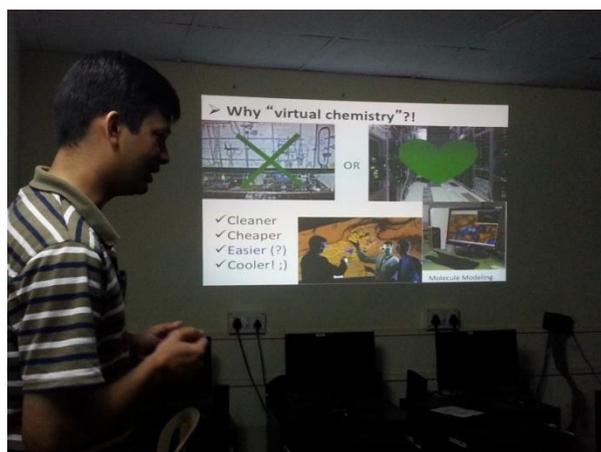
When, How Often:

These talks are typically planned once a month:

Date	Speaker	What was the talk about?	Gift given to students	No of students
6,13 & 20 August 2016	Suman Chakraborty, NCL-Pune	Virtual Chemistry: Building labs inside computers	Book titled "The Story of Chemistry"	105
8, 10 & 24 September 2016	Chandrasheel Bhagwat, IISER-Pune	Fun with Mathematics	Book titled "Mathematics is Fun"	100

Photographs from the talks:

August 2016: Talk on "Virtual Chemistry" by Dr Suman Chakraborty, CSIR-NCL, Pune



Hutatma School



K C Thackeray Vidyaniketan



Dr Vasantdada Patil Vidyaniketan

Sept 2016: Talk on “Fun with Mathematics” by Prof Chandrasheel Bhagwat, IISER-Pune



Hutatma Balveer Vidyalaya



K C Thackeray Vidyaniketan



Dr Vasantdada Patil Vidyaniketan



What did the teachers who attended these talks say?

“It was a very interesting talk I didn’t know about virtual chemistry and the talk gave an insight on this subject. The students found it interesting too.”

- Ms Hemal Aurangabadkar, Science Teacher, K C Thackeray Vidyaniketan

“The concept was explained very well. As students have learnt that molecules can be formed virtually, it sheds their fear of doing experiments in chemistry. Students will feel confident when they try experiments on computer before performing actual experiments.”

- Mrs Neeta Gulawani, Science Teacher, Hutatma Balveer Vidyalaya

Science Clubs at PMC Schools

What:

The students are mentored by research students from IISER-P during the weekly sessions. It gives a plenty of opportunity for the children to do hands-on science and enhance the science they learn in their classes. A science club session typically lasts for 1 hour to one and a half hour. In this time, the members are either engaged in science activities, or they plan/discuss/work on a science project or have a special scientific visitor. These science clubs are structured to take the student participants through a journey that starts with discovering the excitement of science; then transitions to learning the scientific method of making observations, framing hypotheses and arriving at conclusions; and winds up learning how to ask and frame research questions and develop an approach to answering this question.

When and for how long:

Once a week. Typically 1- 1.5 hours.

Where, Who attends, Volunteers:

The science clubs are run in the following schools:



**K.C.Thackeray Vidyaniketan
Daruwala Pul (KCT)**

Number of students attending per week: 29
Grade: 8



**Hutatma Balvir Vidyalaya
Police Lines (HB)**

Number of students attending per week: 32
Grade: 8



**Dr Vasantdada Patil Vidyaniketan
Shukrawar Peth (VDP)**

Number of students attending per week: 50
Grade: 8

Photographs from the science club sessions:



Hutatma Balveer Vidyalaya



Dr Vasantdada Patil Vidyaniketan



K C Thackeray Vidyaniketan

The Science Club Fellows conducting the Science Club sessions at the 3 PMC schools:

K C Thackeray Vidyaniketan:



Kunal Kotheekar
Research Scholar, IISER-P



Swastik Mishra
UG student, 3rd year, IISER-P



Zakhiya P C
UG student, 2nd year, IISERP

Hutatma Balveer Vidyalaya:



Saurabh Kadam
4th year BSMS Student, IISER-P



Sukanya Jogdand
UG student, 5th year, IISER-P



Rishabh Bagawade
UG student, 2nd year, IISER-P

Dr Vasantdada Patil Vidyaniketan:



Nishant Singh
2nd Year PhD Scholar, IISER-P



Nabha Shah
4th year BSMS Student, IISER-P



Dnyanesh Dubal
3rd year PhD, IISER-P

May 2016: Workshop: “On Assessing Environmental Change using Satellite Data”

About the Workshop:

The Exciting Science Group conducted a three-day workshop on “On Assessing Environmental Change using Satellite Data”. The workshop was held from 12 May to 14 May 2016 at the Venture Center, Pune, and was targeted at children between the ages 12 – 14 years. 18 students from 17 schools participated in this workshop, including 5 students from 3 Pune Municipal Corporation Schools (2 from KC Thackeray Vidya Niketan, 2 from Dr Vasantdada Patil Vidyaniketan and 1 from Hutatma Balvir Vidyalaya). Through the 3-day workshop, students were introduced to the GRASS Geographic Information Systems (GIS) software used for geospatial data management and analysis, image processing, graphics and maps production, spatial modeling, and visualization. Students from PMC schools used computers provided by the Venture Center, while the others brought their own laptops.

Details:

Date	Speaker	Title	Duration	No. of Participants	No. of Volunteers
12 – 14 May, 2016	Dr Rahul Chopra, FLAME University Pune	On Assessing Environmental Change using Satellite Data	2.5 hrs / day	18	4

Workshop sessions were conducted by Dr Rahul Chopra, Chair of Centre for Earth and Environment and Associate Professor at FLAME University, Pune. Dr Chopra introduced the participants to the tools and techniques to assess environmental changes using remotely sensed data from satellite and learn the techniques to highlight issues such as urban expansion, changes in forest cover, melting of glaciers, natural and man-made disasters in India and the world. Participants also learnt about the sources of free satellite data such as data from the LANDSAT series of satellites, data disseminated by NASA and USGS. Volunteers drawn from the student body of IISER-Pune including a high school student guided the participants during the workshop. At the end of the 3-Day workshop, students learnt to create posters that demonstrate large scale changes in our environment.

All participants received a certificate of participation while volunteers received a certificate of appreciation along with a T-shirt and mug from ESG. The registration of participants and volunteers was coordinated by Shraddha Gargatti.

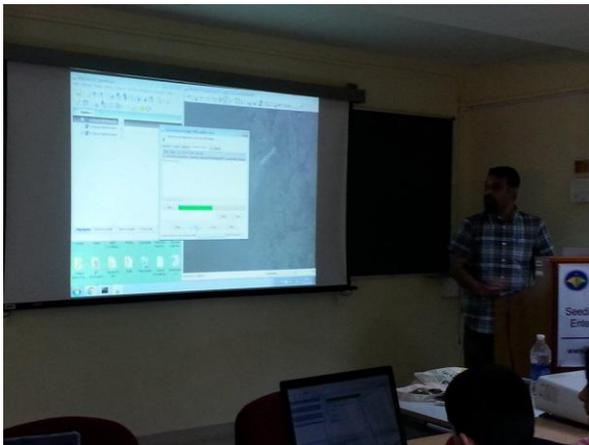
Photographs from the Workshops:



Introduction of the speaker by Dr Guruswamy, Scientist, NCL Pune & ESG coordinator



Introduction to the workshop by the speaker Dr Rahul Chopra, FLAME University



Dr Chopra explaining GRASS GIS software to the participants

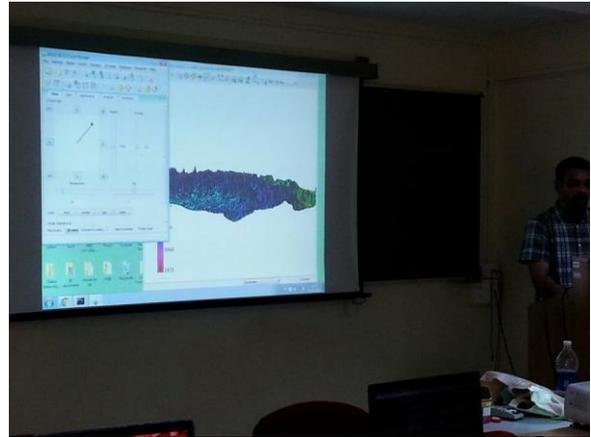
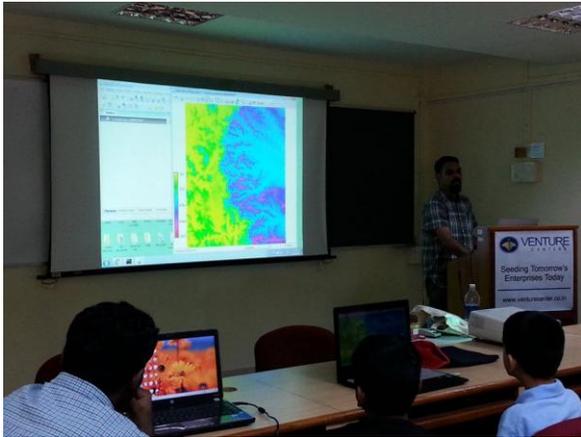


Workshop participants exploring the GIS software

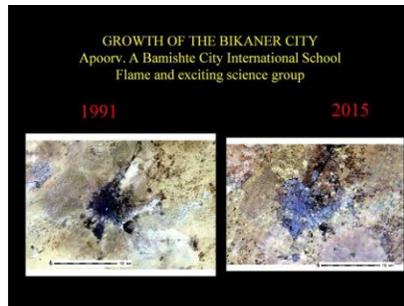


Student Volunteers Wadikur Rehman and Sukanya Jogdand from IISER-Pune guiding the participants during the workshop





Dr Chopra explains the digital elevation data and 3-D Visualization Techniques



Posters made by workshop participants



Workshop Participants

What did the participants who attended these talks say?

After the workshop, kids were asked to fill up an evaluation form in which we had asked the kids to rate us between 1 and 5 (1-Poor; 2-Okay; 3-Good; 4-Very Good; 5-Excellent) on each of the activity (content, explanation by faculty, overall rating, etc). Overall, both the sessions got a rating of either 4 or 5. We also took a feedback on the part of the workshop they enjoyed the most. More than 70% of the participants equally enjoyed the explanation, demonstration, using GIS software and creating posters.

Also, the students were asked for their feedback and suggestions, the following are what they had to say:

“Overall workshop was good, useful for me actually. Our mentor explained the terms very nicely. One suggestion that I would give that the workshop should be for 1 or 2 days more.”

- **Ojas Gopal Kulkarni, DAV Public School**

“I liked the workshop very very much. At first I was not able to understand but at last I understood it very easily.”

- **Sanika Ranjeet Shinde, K V No. 1, Dehu Road**

“Could you please add workshops for HTML, PHP, JAVASCRIPT and Python?”

- **Dhurva Sanjay Ingale, DAV Public School**

“Please conduct the workshop for a bit more days.”

- **Anurag Ravikiran Lad, J.P.N.V Nigdi**

“Comment: I am so happy to attend this workshop. This made me gain my interest and knowledge in order to use computer or any kind of software.”

Suggestion: Now in future if this type of workshop occur the level of understand the work should be more complex and will help to learn more.”

- **Vedang Dinesh Phadke, Bharatiya Vidya Bhavan**

"I would like to attend another workshop for pilots...This workshop was very well performed! It encouraged me to learn things."

- **Vaidehi Vaibhav Sadavarte , St Joseph's High School**

"It was a very exciting workshop. I got to learn a lot of things from the workshop and would be interested in more workshops conducted at NCL. Thank you"

- **Sarah Mooley, Bishops Co-Ed School**

"It was fun. Would love to attend more of these sessions."

- **Aadit Sunil Dane, Millenium National School**

"This workshop was awesome. I did not feel bored. Suggestion: You should have instructed the students to install the software from home. This would result in no problems on 1st day."

- **Sourabh Patil, Kamalnavan Bajai School**

"It was all perfectly planned and done. I enjoyed it and wish it could go on for longer periods of time."

- **Karan Kailashkumar Solanki, K C Thackeray Vidyaniketan**

"The workshop should be for more days."

- **Apoorv A Bamishte, City International School**

May 2016: Workshop: Having Fun with Scratch Programming

The Exciting Science Group conducted a 5-Day workshop on “Having Fun with Scratch Programming”. These workshops were held in May 2016, at the Venture Center, Pune, and were targeted at children between the ages 8 – 10. 29 students from 27 schools participated in the workshop, including 5 students from 3 PMC schools. (2 from Dr Vasantdada Patil Vidyaniketan, 2 from KC Thackeray Vidya Niketan, and 1 from Hutatma Balvir Vidyaniketan). Through the 5 day workshop, students were introduced to the fundamentals of Scratch, a graphical programming interface developed by the Media Lab – MIT, and available for free download.

Details:

Date	Speaker	Title	Duration	No. of Participants	No. of Volunteers
Mon – Fri, 16 – 20 May 2016	Shraddha Gargatti	Having Fun with Scratch Programming	2.5 hrs/ day for 5 days	29	6

The workshop sessions were conducted by Shraddha Gargatti over a 5-day period, from Monday to Friday in May 2016. Students from PMC schools used computers provided by the Venture Center, while the others brought their own laptops. Ms Gargatti introduced logical structures and programming through the scratch interface. Interesting animation and games were demonstrated using controls and webcam. The use of the Sensor board, hardware was also demonstrated to develop interactive interfaces between the programming environment and the real world (viz. use the computer to “sense” sound and light stimuli using the USB Sensor board). At the end of the workshop, children were able to develop their own animation, games and graphic stories. On the last day participants were given a chance to develop their own story or game. A competition was organized for the best game or story. The participants were given two hours to work on their ideas and present their project. Dr Sutirth Dey, Associate Professor at IISER-Pune was present on the last day to view the projects made by the young participants. Three best projects were chosen and gifted a prize by ESG.

Volunteers drawn from the student body of the Indian Institute of Science Education and Research (IISER), Pune including a parent helped Shraddha run each workshop session. These volunteers were oriented by Shraddha prior to the start of the workshop. All participants received a certificate of participation at the end of the workshop while volunteers received a certificate of appreciation along with a T-shirt and mug from ESG. The registration of participants was coordinated by Gayatri Kshirsagar and registration of volunteers was coordinated by Shraddha Gargatti.

Photographs from the Workshops:



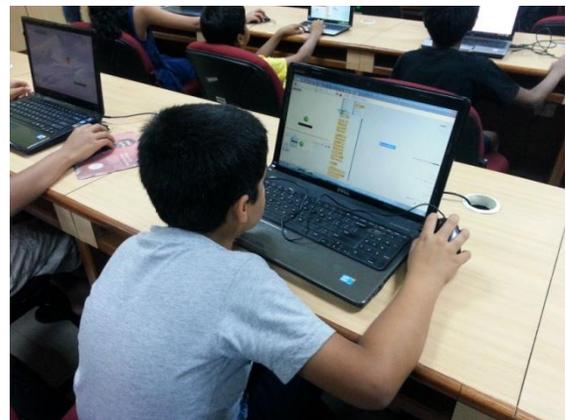
Speaker introducing Scratch interface to the participants



Participants exploring Scratch software



Participants learn to use the programming blocks in Scratch to make a game/story



Participants attempting to program a Pong Game



Participants attempt to make their own game/story on the last day



Dr Sutirth Dey viewing the projects made by participants



Workshop participants with their certificates

What did the participants who attended these talks say?

After the workshop, kids were asked to fill up an evaluation form in which we had asked the kids to rate us between 1 and 5 (1-Poor; 2-Okay; 3-Good; 4-Very Good; 5-Excellent) on each of the activity (content, explanation by faculty, overall rating, etc). Almost all the participants gave a rating of 5. We also took a feedback on the part of the workshop they enjoyed the most. 50% of the participants enjoyed the demonstration programs the most.

Also, the students were asked for their feedback and suggestions, the following are what they had to say:

"I love the workshop. I love Scratch games"

- **Advaith R, The Orchid School**

"I had lot of fun. It was the best time of my life."

- **Vibhavari B, St Joseph's High School**

"Very good planned."

- **Karan Solanki, K C Thackeray Vidyaniketan**

"I like the workshop. It was nice."

- **Laxmi Ghotekar, Millenium National School**

"The teachers teach very well and this class was the best class ever."

- **Harika, Wisdom World School**

"I loved the workshop and I pray to god it should continue."

- **Anish Deshpande, Victorious Kids Educare**

"I like the workshop so much."

- **Shraddha Kulkarni, Vision English School**

May 2016: Workshop: Raspberry Pi Programming

The Exciting Science Group organized a 3-Day workshop on “**Raspberry Pi Programming**” in May 2016, at the Venture Center, Pune, and were targeted at PMC school children from grade 7 and 8. 26 students from 3 PMC schools participated in the workshop. (8 from Dr Vasantdada Patil Vidyaniketan, 10 from KC Thackeray Vidya Niketan, and 8 from Hutatma Balvir Vidyaniketan). Through the 3 day workshop, students were introduced to the open-source hardware tool known as Raspberry Pi, a credit card-sized computer developed by the Raspberry Pi Foundation, UK, to promote basics of computer science in schools. It is an extremely versatile device which can be used to design and build electronics projects that interact with the real world. The device has gained popularity recently as an effective means to engage in exploring STEM concepts and practices.

Date	Speaker	Title	Duration	No. of Participants	No. of Volunteers
Wed – Fri, 25 – 27 May 2016	Dr Girish Arabale	Raspberry Pi Programming	7 hrs/ day for 3 days	26	2

Workshop sessions were conducted by Dr. Girish Arabale, founding director of a startup called Molqbits (incubated at NCL Innovation Park). During the workshop, Dr Arabale taught students how to use command line interface, how to solve problems with Wolfram| Alpha- a computable search engine on Raspberry Pi. Once they became a little comfortable in using the device, they were introduced to Mathematica and Wolfram programming language that are freely available on Raspberry Pi. Students successfully learned to calculate even, odd, and prime numbers using Mathematica. Later on they wrote programs for simple conversions like Fahrenheit to Celsius, and more advanced like finding Palindrome numbers and Perfect Numbers. They also learned about GPIO and to connect LEDs to different pins on Raspberry Pi. On the last day, Dr Arabale showed them how to use camera interface along with a few basic image processing commands. Students learned how to calculate the extent of photosynthesis from the plant leaf images with a little bit of programming. Participants were provided with Raspberry Pi boards and computers arranged by ESG along with fruit juice and refreshments during the workshop.

The registration of participants was coordinated by Gayatri Kshirsagar. Shraddha and Gayatri helped Dr Arabale run each workshop session. At the end of the workshop, all participants received certificate of participation from ESG.

Photographs from the Workshops:



Speaker Dr Girish Arabale explains the Raspberry Pi to the participants



PMC school students in the workshop



Participants explore Mathematica to calculate even, odd, and prime numbers



Participants learning to connect LED



Participants use the camera interface to capture the plant leaf images to calculate the extent of photosynthesis using image processing commands



Workshop Participants

What did the participants who attended these talks say?

After the workshop, kids were asked to fill up an evaluation form in which we had asked the kids to rate us between 1 and 5 (1-Poor; 2-Okay; 3-Good; 4-Very Good; 5-Excellent) on each of the activity (content, explanation by faculty, overall rating). Overall, all the sessions got a rating of either 4 or 5. We also took a feedback on the part of the workshop they enjoyed the most. All the kids enjoyed

Also, the students were asked for their feedback and suggestions, the following are what they had to say:

Ajit Badambe, K C Thackeray Vidyaniketan:

Other comments or suggestions:

RaspberryPi Workshop was helpful to me because I get to learn more usefull and important information about electronics. I learned it now and I will get more use in colleges when I do my engineering. There are many things that I learned.

Pranita Deshmukh, Dr Vasantdada Patil Vidyaniketan:

Other comments or suggestions:

I Like this workshop because we learn so many things, so I like it very much. If we study from practical so like it. I thing we attain this workshop again & again.

Dhanashree Mane, Hutatma School:

Other comments or suggestions:

मला हा Workshop खूप आवडला.
मला या Workshop मध्ये, Mathematica, walfreamalpha, Electronics आणि इतर विषय खूप आवडले
या Workshop मध्ये मी तीन नवीन विषय शिकले.

Omkar Shinde, Dr Vasantdada Patil Vidyaniketan:

Other comments or suggestions: मला हे वर्कशॉप खूप आवडले. येथे साम्हाल्या अनेक गोष्टी शिकायल्या मिळाल्या. त्यात साम्हाल्या कधी न माहित असलेल्या 'रस्पबेरीपाच' ची माहिती सांगितल्या ती आपण कोठेही वापर करू शकतो त्याच्या मदतीने आपण कॉम्प्युटर वर बसून अनेक गोष्टी चालवू शकतो. येथे साम्हाल्या अनेक शिक्षकांनी शिकवले. मी त्यांचे आभार मानतो

Thanks

Vaishnavi Devkar, Hutatma Balvir Vidyalaya:

Other comments or suggestions: मला अ इथे खूप जरी शिकण्यासाठी भेटले, तिथे मला माहिते कशी सोड्याची ते कळाले त्यातील सर्वात Interesting mathematical होती ते मला खूप आवडले त्या कसले ही प्रश्न माहितीचे प्रश्न विचारले तर त्यांचे उत्तर लगेच यायचे.

Maruti Bandgar, K C Thackeray Vidyaniketan:

Other comments or suggestions:

Raspberry workshop was helpful for me. I got to learn many things in these 3 days and I enjoyed it. I learned new thing which I never heard of it before. I loved the workshop and I would like to come here again.

April – June 2016: Summer Internship Programme

About the programme: Starting last year, the Exciting Science Group initiated the Summer Internship Programme for the PMC students between April to June. The objective of the internship programme is to provide an opportunity for students to work with mentor scientists and PhD students at NCL and experience what it means to work in a research laboratory over a period of two full months.

This year, we selected three students from two PMC schools we partner with, for the programme: Hutatma Balveer Shirishkumar Vidyalaya, and K.C Thackeray Vidya Niketan.

The three students spent their entire summer break from 15 April 2016 to 15 June 2016 in research laboratories at CSIR-National Chemical Laboratory, Pune.

Name of the student	Name of the school
Vaishnavi Devekar	Hutatma Balveer Shirishkumar Vidyalaya
Deshmukh Nishad	K.C. Thackeray Vidyaniketan
Abhishek Nindgali	K.C. Thackeray Vidyaniketan

Dr. Chetan Gadgil, scientist at CSIR-NCL, along with his PhD student Priyanka Saxena mentored Vaishnavi Devekar on the project “To study the length to breadth ratio of different petals and leaves”

Dr. BLV Prasad, scientist at CSIR- NCL, mentored Deshmukh Nishad and Abhishek Nindgali. Both worked with one of the Ph.D student, Jayesh Shimpi, to study the different methodologies involved in synthesis of nano-particles.

ESG organized orientation session for the students, parents and teachers on 15 Apr 2016. Students maintained a weekly report of the work done by them in the laboratory. This activity helped them record and interpret the observations. They also learned to present the data of their laboratory work. Gayatri Kshirsagar coordinated with these students, their parents and teachers during the internship programme.

A felicitation event was organized by ESG after the internship to meet these students and their scientist mentors at the end of this programme. The students gave a brief presentation of their work and also shared their learning experience during the event.

Photographs of the Summer Internship Programme:



Deshmukh and Abhishek working in Dr Prasad's lab under the guidance of Jayesh



Vaishnavi (3rd from left) along with Priyanka and other PhD students in Dr Gadgil's lab

Feedback from students:

"This was a very wonderful opportunity for me to come here and learn the things which I didn't know before. I would like to thanks my mentors Dr.B.L.V. Prasad Sir and Jayesh Bhaiya for supporting me for learning anything in lab and I would also like to thanks all my lab mate for helping me whenever I need it. I would like this program to continue so that others should learn science."

- Deshmukh Nishad, K C Thackeray Vidyaniketan

"This program is very nice. Due to this program I got to know many new things. I think this program should continue like this it shouldn't stop. I want to thank my school for giving me this golden chance and they have a big hand in this. I want to thank all our lab mates they never let me feel alone whenever I had a question they all answered it. They taught me lots of new things. I want to specially thank Prasad sir for giving me permission to work in his lab."

- Abhishek Nindgali, K C Thackeray Vidyaniketan

June 2016: Workshop on “Science Club Training”

Half-Day Workshop on “Science Club Training” was organized by ESG in collaboration with GREAT Foundation to take the idea of the science club programme that we have developed over the years and provide training for this to be replicated by teachers in schools. 12 Teachers from 9 PMC schools and 36 corporate volunteers participated in the workshop. The workshop was conducted by students volunteers Harshvardhan Jog, grad student at IISER-Pune and Priyanka Saxena, PhD student at CSIR-NCL, Pune. Both have been associated with ESG in the past as science club mentors.

The purpose of this workshop was to provide a framework for science club sessions for 7-9 standard school kids. The idea was to highlight the skills required for scientific experiments and present a possible stepwise methodology of inculcating these skills.

Date	Speaker	Title	Duration	No. of PMC teachers	No. of Corporate Volunteers
Sat, 4 June 2016	Harshvardhan Jog & Priyanka Saxena	Science Club Training	3 hrs	12	36

The workshop started with some experiments which can make science approachable and exciting for the kids. Priyanka and Harsh demonstrated magic message by using turmeric-detergent, straw flute, paper chromatography and a simple surface tension experiment with pepper and detergent. After a brief discussion on possible alternatives and possible problems in conducting these experiments they moved on to see how interesting questions can be asked using simple but exciting experiments. For this, the glue-borax experiment was demonstrated. They took a short interlude to let the teachers try the experiment themselves. After re-emphasizing how exciting experiments can be used to make observations and asking questions they discussed the importance of observations in more detail. The teachers were asked to observe two burning candles and make notes. This was followed up with some discussion on unusual and interesting observations that can be made without being told what to look for. A few interesting observations and the significance of unbiased observations in science were then discussed. The observations led to some questions for which both discussed some possible answers/guesses (hypotheses). Participants were showed a video of an activity conducted by Dr. K P Mohanan to explain how hypotheses can be tested and eliminated. Through this video it was highlighted how unacknowledged assumptions can cause trouble in scientific experiments.

To put all the elements together viz. making observation- asking questions-formulating hypotheses-testing and eliminating hypotheses they demonstrated heat conduction experiment, here candle wax on metal rods melted as a function of distance from the burner flame. This experiment can also be used to discuss the concept of error, importance of repetition, tabulating data and plotting the results. As an alternative to this experiment they discussed Winogradsky column where the results are qualitative unlike heat conduction experiment. Discussion was done on some ways that can be suggested to the kids which can make internet search more effective for them and importance of referring to trustable sources of information.

Priyanka and Harsh concluded the discussion by re-emphasizing the aspects of this framework for going from majorly teacher facilitated science lab sessions to majorly children driven science experiments. At the end they had an open discussion on how difficult/easy it is for the kids to think independently and come up with interesting questions. The idea was also summarized by a TED talk by Beau Lotto. The teachers seemed enthusiastic to try the framework (or some parts of the framework) discussed in the workshop in their classes.

Photographs:



Introduction to the workshop by Dr Guruswamy, Scientist, NCL Pune and ESG Coordinator



Priyanka Saxena and Harshvardhan Jog conducting the workshop session



Participants: Teachers from PMC schools and Corporate volunteers

What did the participants who attended the workshop say?

After the workshop, participants were asked to fill up an evaluation form in which we had asked them to rate the session between 1 and 5 (1-Poor; 2-Okay; 3-Good; 4-Very Good; 5-Excellent) on each of the activity (content, explanation by faculty, overall rating). Overall, the workshop got a rating of either 4 or 5.

The participants were also asked to share their feedback and suggestions, the following are what they had to say:

“Good Workshop and learned a new way to teach students.”

- Theja Dokku, Cognizant Technology Solutions (For Nagubarve PCMC School)

“Humare school ke baccho ko bhi science club ke liye tayaar karne mein aapki help chaiye.”

- Haveli RehanaMohiuddin, M M Urdu Vidyaniketan

“It’s really a helpful session. It will help to remove the fear of students.”

- Rakesh Rameshchandra Jain, Eaton Tech Pvt Ltd

“This type of training should be for all subject teachers, not only for science teachers.”

- Shaikh Zaheeda Husain, PMC’s Maulana Md Ali Urdu Madhayamik Vidyaniketan,
- Nikhat Jabeen Malek, S S Hakim Ajmal Khan Urdu High School, Yerwada

“Use of Marathi is also necessary in the explanation. Overall, it is a good training.”

- Deshmukh Ambadas, Yashadeep Madhyamik Vidyalaya, Warje

“Really a nice activity. Being an engineer, never thought of science the way it is demonstrated in the session today. Great work and keep it up!!!

- Sandesh Vardhekar, Cognizant Tech Solutions (for PMC Swami Vivekanand School)

TIMES OF INDIA – 16 MAY 2016

THE TIMES OF INDIA

Teens learn to use satellite data for environmental issues

TNN | May 16, 2016, 04.52 PM IST



PUNE: The Exciting Science Group, a volunteer group of scientists from National Chemical Laboratory (NCL) and the Indian Institute of Science Education and Research (IISER), Pune, based at Venture Center, recently organised a three-day workshop on 'Assessing Environmental Change using Satellite Data.'

The aim, to introduce 12-14-year-olds to the Geographic Information Systems (GIS) software used for geo-spatial data management and analysis, image processing, graphics and maps production, spatial modeling, and visualization.

The workshop sessions were conducted by Rahul Chopra, chair of Centre for Earth and Environment and Associate Professor at FLAME University, Pune.

Chopra introduced the participants to the tools and techniques to assess environmental changes using remotely sensed data from satellite and learn the techniques to highlight issues such as urban expansion, changes in forest cover, melting of glaciers, natural and man-made disasters in India and the world.

Participants also learnt about the sources of free satellite data such as data from the LANDSAT series of satellites, data disseminated by NASA and USGS. Students also learnt to create posters that demonstrated large scale changes in our environment. They also received a certificate of participation from ESG.

SAKAL TIMES – 23 MAY 2016

Exciting Science Group holds workshop for kids

HAVING FUN WITH SCRATCH PROGRAMMING

ST CORRESPONDENT
reporters@sakaaltimes.com

Sakal Times

Pune: Exciting Science Group, a volunteer group of scientists from CSIR-NCL and IISER, Pune, based at Venture Centre, organised a five-day workshop on 'Having Fun with Scratch Programming' to introduce 8-10-year-old students to Scratch, a graphical programming language developed by the MIT Media Lab to create animation, games etc.

It is designed as the first introduction to structured logic and programming. The workshop, conducted in May, was conducted for a batch of 29 students and was free for the participants. The workshop sessions were conducted by Shraddha Gargatti, Senior Associate - Exciting Science Group.

During the five-day workshop, Gargatti introduced the participants to the scratch interface and introduced the logical and structured pr-



Children at the workshop organised by Exciting Science Group.

gramming flows. Interesting animation and games were demonstrated using controls and webcam. She also demonstrated the use of the Sensor board to develop interactive interfaces between the programming environment and the real world.

At the end of the workshop, children were able to develop their own animation, games and graphic stories.

All the participating students received a certificate of participation from ESG. This workshop was co-sponsored

by Forbes Marshall Foundation, Praj Foundation, Persistent Foundation and Nag Foundation.

ESG organises regular programmes to bring the joy and excitement of scientific research to school students. ESG will be conducting a talk on 'Atoms, Molecules and Light' on May 29.

However, pre-registration is necessary for all the events, details of which can be obtained from the ESG website (www.exciting-science.org).

PUNE MIRROR 30 MAY 2016

Eminent scientist Dr Sayan Bagchi spent a part of the day talking to schoolkids about the relationship between atoms, molecules and light

In an interactive talk session on 'Atoms, Molecules and Light', students from different schools spent a part of their Sunday interacting with eminent scientist Dr Sayan Bagchi.

The talk was organised by The Exciting Science Group (ESG), a volunteer group of scientists from the National Chemical Laboratory (NCL) and the Indian Institute of Science Education and Research (IISER).

"Every object around us is made up of smaller objects, which can be further divided into even smaller particles. However, 'big' and 'small' are relative definitions and can be questioned further. Definition is surface-level understanding, which wouldn't really help students when it comes to applying these concepts. My aim was to discuss the relationship between atoms, molecules and light by giving them different examples from every life," Bagchi, who completed his doctorate in physical chemistry from the University of Pennsylvania, Philadelphia, and now works in the Physical and Materials Chemistry Division at NCL, told Mirror.

His approach certainly appealed to the students who had gathered for the talk. Vedang Dinesh Phadke, a Class VIII student from Bharatiya Vidya Bhavan, said, "I always wondered how jellyfish emit light. I got the answer on Sunday when Dr Bagchi explained how a light molecule can produce impact on another molecule and produce light through radiation. It was like a storytelling session when the concept of bioluminescence was explained to us."

Dhruva Ingale, a Class VI student of DAV Public School, said, "I had only heard of light and the concept of photons. But, at the lecture, Dr Bagchi explained these concepts by tracing the history of the journey from Albert Einstein to Arthur Compton to G N Lewis. He also explained how one theory led to another and how assumptions led to theories."

Vishwesh Patil, another student who attended the lecture, said, "Dr Bagchi asked us if light could be produced with the interaction of two chemicals or molecules. I promptly answered in the negative. But, when he gave the an example of glow sticks which produce light after mixing of two chemicals, my interest was piqued. He went on giving us examples such as fireflies and jellyfish. I've seen pictures of them, but had no idea that they worked on the same principle."

Phadke added, "I have learnt in school about the relationship between molecules, atoms and light. But, I did not know how one molecule and one light can produce another and that this is called phosphorescence. Neither did I know how one molecule and another molecule can produce light as seen in fireflies. Also, I learnt that two lights can produce a third, and that blue light is formed after mixing two red lights."

Gayatri Khsirasagar, one of the volunteers from ESG, said, "The primary objective of the talk was to have scientists share the excitement of science with school children, rather than simply teaching them. Their interest was evidently aroused as there was a flood of questions during the post-talk session."

I always wondered how jellyfish emit light. I got the answer on Sunday when Dr Bagchi explained how a light molecule can produce impact on another molecule and produce light through radiation

**VEDANG DINESH PHADKE,
A CLASS VIII STUDENT FROM
BHARATIYA VIDYA BHAVAN**



The talk caught students' interest and there were several questions following the talk.

SAKAL TIMES – 7 JUNE 2016

Raspberry Pi workshop held for 3 civic schools

The mini computer is a device which can be used to design and build electronics projects that interact with real world

ST CORRESPONDENT
reporters@sakaaltimes.com

Pune: A three-day workshop on Raspberry Pi was organised at Pune Municipal Corporation (PMC) schools recently.

A total of 26 students from three PMC schools, Hutatma Balveer Shrishkumar, KC Thakare Vidyaniketan and Vasantdada Patil Vidyaniketan, attended the workshop. It was guided by Girish Arabale.

The workshop was organised by Exciting Science Group (ESG)- a volunteer group of scientists from CSIR-NCL and IISER-Pune based at Venture Center. Raspberry Pi is a credit card-sized computer developed by Raspberry Pi Foundation, UK, to promote computer science basics in schools.

It is an extremely versatile device which can be used to design and build electronics projects that interact with the real world. The device has gained popularity recently as an effective means to engage in exploring STEM (Science, Technology, Engineer-



LEARNERS ALL: Children listen to a demonstration at the ESG organised workshop on Raspberry Pi.

ing, Maths) concepts and practices.

During the workshop, students learned how to use command line interface and how to solve problems with Wolfram|Alpha- a computable search engine on Raspberry Pi.

"Once they became a little comfortable in using the device, they were introduced to Mathematica and Wolfram programming language that are freely available on Raspberry Pi. Students successfully learned to calculate even, odd, and prime numbers using Mathematica. Later on, they wrote programmes for simple conversions like

Farhenheit to Celsius, and more advanced ones like finding Palindrome numbers and Perfect Numbers. They also learned about GPIO and to connect LEDs to different pins on Raspberry Pi.

"They learnt how to use camera interface along with a few basic image processing commands. Students learned how to calculate the extent of photosynthesis from images of plant leaves with a little bit of programming," said Gayatri Kshirsagar, an associate of ESG. At the end of the workshop, all students received certificates for participation.

Sakal Times

TIMES OF INDIA – 18 JUNE 2016

Printed from

THE TIMES OF INDIA

Exciting science group lecture to be organised today

TNN | Jun 18, 2016, 04.30 PM IST

PUNE: The Exciting Science Group has organised a lecture by scientist Janardan Kundu in the series outreach popular talk on June 19. The group has been set up by scientist from National Chemical Laboratory, CSIR in a bid to popularise science.

In his lecture on Sunday Kundu will speak on 'Science and technology in everyday life'. The talk will discuss on the broad topic of science that we encounter in everyday life. It will primarily motivate students to make observations around them and try to think rationally regarding the operational science behind it. A plenty of examples of common encounter with science in everyday life will be discussed with the help of lot of audio video slides. Students would be made aware that science is powerful and all around us. However, there are instances that science can not explain what we observe and hence science is an ever evolving field.

The lecture will be held at 10 am at the training room, venture centre, NCL innovation park in Pashan. The speaker Janardan Kundu is a scientist at CSIR- NCL His area of research is rational synthesis of nano-materials targeted towards variety of applications from sensing to solar cells.

SAKAL TIMES – 19 JUNE 2016

मनपा शाळेतील विद्यार्थ्यांना 'समर इंटरनशिप'मध्ये संधी

पुणे, ता. १८ : 'एक्ससायटिंग सायन्स ग्रुप'तर्फे रावविण्यात येणारा 'समर इंटरनशिप प्रोग्रॅम' हा विज्ञानविषयक उपक्रम नुकताच झाला. राष्ट्रीय रासायनिक प्रयोगशाळा (एनसीएल) आणि 'आयसर' या संस्थांतील हौशी वैज्ञानिकांच्या वर्तीने हा उपक्रम घेण्यात येतो. यात महापालिकेच्या विद्यानिकेतन शाळांमधील हुतात्मा वालवीर शिरीषकुमार विद्यालय आणि के. सी. टाकरे विद्यानिकेतन या शाळांतील ३

विद्यार्थी सहभागी झाले होते. त्यांना १५ एप्रिल २०१६ ते १४ जून २०१६ या कालावधीत प्रयोगशाळेत (एनसीएल) काम करण्याची संधी मिळाली. या उपक्रमाचे हे दुसरे वर्ष होते. मुलांमध्ये विज्ञानविषयी आवड निर्माण व्हावी, या उद्देशाने हा उपक्रम घेण्यात आला. त्यातून मुलांना संशोधन म्हणजे नेमके काय, शास्त्रज्ञ प्रयोगशाळेत कसे काम करतात, पीएचडी कशा प्रकारे केली जाते, अशा अनेक प्रश्नांची उकल झाली.

SAKAL TIMES – 26 JUNE 2016

PMC students paint futuristic picture

Reporters Name | Sakal Times | Sunday, 26 June 2016 AT 11:27 PM IST

Exciting Science Group, Science and Art



Pune: A volunteer group of scientists from CSIR-NCL and IISER-Pune called Exciting Science Group (ESG) organised 'Science and Art' competition for Pune Municipal Corporation (PMC) schools on Saturday. The competition received a good response from the schools.

Sandhya Jadhav, Headmistress of Hutatma Balvir Shirishkumar Vidyalyaya, told Sakal Times that the response was quite encouraging. "More than 100 students from eight PMC schools participated in the contest. The competition gave platform to the PMC students who are good in illustrations skills and also encouraged their thinking skills in scientific concepts," added Jadhav.

She added that such initiatives help the students realise that there is science in ever aspect of life.

During the prize distribution ceremony, chief guest Ravi Paranjape spoke to the students about Art and Science, and how they are correlated. "Students have to learn our ancient arts and develop their own style. This will give birth to new innovations. Students should think beyond their curriculum. They have to believe in their perception. This will help us to create new innovation in science as well as build our nation," said Paranjape.

Topics given to the students were 'Draw a day in science lab', 'The world without water', 'If I were a microorganism' and 'My dream car'.

PUNE MIRROR – 26 JUNE 2016

SEEING SCIENCE THROUGH BRUSHSTROKES

By Darshana Daga, Pune Mirror | Jun 26, 2016, 02:30 AM IST



The Students had a host of topics to draw from, one of them being 'The world without water'. PICS: MAHENDRA KOLHE

Group of scientists from CSIR-NCL, IISER organise drawing competition for PMC-run schools in order to bring out excitement and wonder of the subject

It was a rare academic treat for students of Pune Municipal Corporation (PMC)-run schools as a group of scientists organised a competition combining science and art for them on Saturday. As many as 102 students from eight different schools took part in the competition by The Exciting Science Group (ESG) – formed by experts from the Council of Scientific and Industrial Research-National Chemical Laboratory (CSIR-NCL) and Indian Institutes of Science Education and Research (IISER).

The topics given for drawing were 'A day at the science lab', 'The world without water', 'If I were a microorganism' and 'My dream car'. "This competition aims to motivate students so that they understand the correlation between science and art, that will also boost their imagination," said NCL scientist Guruswami Kumarswami. ESG organises regular programmes to bring out the joy and excitement of scientific research among school students.

Artist Ravi Paranjape, who was the chief guest at the event, said, "Science and art are fields which could only be developed through an innovative approach. Students must start questioning everything and should think beyond their curriculum. They have to believe in their perception. This will help us with innovations in science as well as nation-building activities."

Gayatri Kshirsagar, an ESG volunteer impressed upon the uniqueness of the initiative, saying, "There are many drawing competitions organised in the city, but no one takes science as the theme." IISER scientist Sukirt Dey added, "ESG aims to create an interface between school students and practicing scientists. The primary objective of this group is to have scientists share the excitement of science with school children, and not to 'teach' science."

Students lapped up the theme with enthusiasm. "It was a challenge for the imagination. Though I learn science every day, it was difficult to visualise that and draw. But, when I completed my drawing, there was a sense of fulfilment," shared Prachi Balaji Balla from K C Thakare Vidya Niketan School.

Laxman Prajapati from Ahilyadevi Holkar School, who had chosen the topic, 'The world without water', said, "When I started to think on my picture, I recollected the recent issue of farmer suicides owing to the severe drought in the state. But, it is not just the humans who would be in trouble. The entire ecosystem would be lost without water. So, I incorporated both the things in my drawing."

SAKAL MARATHI - 28 JUNE 2016



शेवाजीनगर : हुतात्मा बालवीर शिरीषकुमार विद्यालयात घेतलेल्या चित्रकला स्पर्धेत विद्यार्थ्यांनी काढलेली चित्रे.

चित्रकलेत सूरज कांबळे प्रथम

एकरावटिंग यवन्व वृत्तव्या (इंग्रजी) वर्गाने अंतरराष्ट्रीय वेबकला स्पर्धा घेण्यात आली. या स्पर्धेत महाराष्ट्रातल्या आठ विद्यार्थिकांमधून शाळांमध्ये १०२ विद्यार्थी सहभागी झाले होते. स्पर्धेत काजू जगादीसम शाळेतील सूरज कांबळे याने प्रथम क्रमांक मिळविला आहे.

'इंग्रजी' लॅंग्वेज 'विज्ञान आणि कला' यावर आधारित ही स्पर्धा ठेवण्यात आली. या स्पर्धेसाठी चित्रकला रवी परांजने प्रमुख पाहुणे म्हणून उपस्थित होते. कार्यक्रमाचे समन्वय याचवी खोरसागर यांनी केले. 'विज्ञान प्रयोगशाळेत एक दिवस', 'साप्ताहिक साय जग', 'साध्या सल्लागीत कर' असे विषय स्पर्धेसाठी दिले होते. स्पर्धेत उत्तम प्रजापती (अहिल्यादेवी

होळकर शाळा) आणि प्राची बालव (केमरी) यांनी द्वितीय क्रमांकाचे पारितोषिक मिळविले. तर तिसरा क्रमांक (टी. वसंतदास पाटील शाळा) याला तृतीय क्रमांकाचे बक्षीय मिळाले. जवळी पाटील यांनी या स्पर्धेचे पंतप्रधान केले.

परांजने म्हणाले, 'विद्यार्थ्यांनी उत्तमरी प्राचीन कला शिकण्यावर भर द्यावा आणि लक्षात आणायी सल्लागी रीती विकसित करावी. यामुळे नवीन-नवीन कलाकृती साकारण्यास मदत होईल. मोठी सल्लागी पाहिली आणि ती प्रत्यक्षात उपस्थितसाठी प्रयत्न करावेत.' 'विज्ञान व कला यावर आधारित असलेली ही चित्रकला स्पर्धा महाराष्ट्रातल्या शाळांमध्ये पारितोषिकाचे आर्थिक करणेत आल्याचे खोरसागर यांनी सांगितले.

Sakal Times – 20 July 2016

Scientists hold talk on art and science of colours

The goal was to promote correlation of science and arts

ST CORRESPONDENT
reporters@sakaaltimes.com

Pune: A volunteer group of scientists from CSIR-NCL and IISER-Pune called Exciting Science Group (ESG) organised a 'Science talk on 'The Art and Science of Colour' for students of private schools followed by science and art competition on Saturday at Venture Centre.

The goal of this combined event was to motivate students to understand the correlation between science and art which will also boost their imagination.

The topics included in the competition were the world without technology, Indian agriculture in

2050 and a life on another planet. More than 150 students from various schools across the city attended the competition to merge science with art.

BOOSTING IMAGINATION

Saya Sengupta, a scientist from CSIR-NCL, addressed the students on the topic 'The art and science of colours'. He briefed the students that history of colours and how colours are formed through various reactions.

Shivprasad Patil, associate professor at IISER, was the Chief Guest for the event whereas artist

Jayanti Patil judged the competition.

This competition was conducted in two groups, first for for class 7 and class 8 and the second group for class 9 and class 10.

Gayatri Kshirsagar, associate from ESG, said that the students often think that science and art are different things.

"We are merging science with art, we are trying to make the students realise that science is present everywhere. Hence, having an scientific attitude is necessary and hence, this exercise helps the children understand the science involved in every day life," added Kshirsagar.

TIMES OF INDIA – 12 OCT 2016

Oct 12 2016 : The Times of India (Pune)

Dad's death becomes defining moment for Pashan youth

Ardhra.Nair@timesgroup.com

He had passed standard X, when his father was diagnosed with cancer and his mother, who worked as a maid, was finding it hard to make both ends meet.

Shekhar Jadhav (19) had fleetingly thought of quitting studies to work. But a sympathetic mentor and a few good students gave their time to teach him and Jadhav is now a third-year student of biology at the Indian Institute of Science Education and Research (IISER) aspiring to carry out research in cancer.

Jadhav is an inspiration to students from his neighbour-

hood in Nimhan Mala, an impoverished neighbourhood in Pashan area. After scoring 93% in standard X from a municipal school, Shekhar was thinking of dropping out of school.

"We had an Exciting Science group where people, especially from National Chemical Laboratory, teach students about basic science. One of them was Guruswamy who noticed my interest in science and would tell me about various competitive exams like the JEE. But I never wanted to go to IIT as pure science fascinated me," Shekhar said.

This led his mentor to

Spreading knowledge

Shekhar is now a member of Disha. After experiencing how a few good and determined minds can change a person's future, Shekhar has decided to do what they did for him. "This year, my friends and I have decided to teach three girls from my own school who did well in their standard X and XI. I will be teaching them physics, chemistry, biology and mathematics. I can't ever thank enough all those who helped me get here. I know how hard it is for a child in a PMC school to achieve something. Teaching needy children is the best way to give back," he added.



talk to members of Disha, a student outreach programme by students of IISER, Pune. While Disha was into teaching students in the slums, there was no specialized train-

ing. "Some students started teaching me physics, chemistry, biology and mathematics. I am the only student who has ever been taught in such a special manner,"

Shekhar said. But the stress at home due to his father's illness, a change in the teaching pattern in schools and junior colleges, and the intermediate training by IISER students led to Shekhar performing badly in standard XII. "I could just make the cut off to apply to IISER. I knew it was a do-or-die situation for me," he said.

Shekhar plunged into studies. "Somebody told me the results would be declared the same day. I don't have an internet connection at home so I kept calling people every hour. I called a Disha coordinator at 3am to ask about the results," he added.

That year, the results were announced five days later. Shekhar said they were the worst five days. "On the sixth day, the result was announced and I was in. Nobody from our locality knows what IISER is. To them, it is a cluster of intimidating buildings on the left while going to the university from Pashan," he said.

His parents paid his fees through loans from friends, and the second and third year fees were paid by Shekhar himself. "I get Rs 5,000 as stipend every month which I saved. I want to do research in cancer, hence I chose biology," he added.