The Joy of Science

Annual Report
2016 - 17

Golden Jubilee
1966 - 2016

50 years of excellence in Science education

VIKRAM A SARABHAI
COMMUNITY SCIENCE CENTRE

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Innovative Programmes and Material for Science Education

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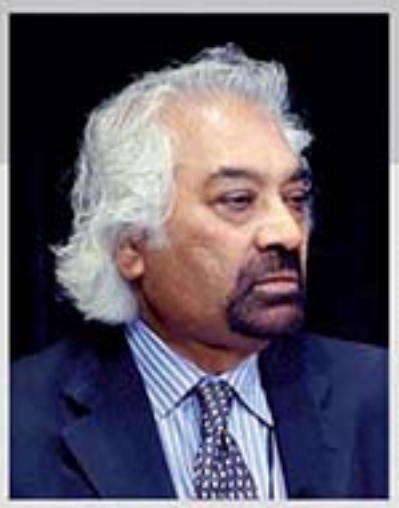

Chairman's Message

Vikram A Sarabhai Community Science Centre (VASCSC) is successfully fulfilling its role of popularizing Science amongst the masses and building scientific temper through several innovative programmes. As the Centre completed 50 glorious years on 1st June 2016, I felt a sense of pride to be associated with VASCSC and a part of its magnificent journey. This Annual Report presents the work done by VASCSC for innovation in Science education, to reach out and to scale up, which have been the top priorities for it to leverage its position globally as a twenty first century knowledge institution. VASCSC has pioneered many initiatives in Science education and communication and I extend my best wishes for its success as Centre of Excellence.

I always believed that Centre should focus on innovation, along with building spirit of inquiry among all. It is good to know that VASCSC has added to its portfolio of innovative programmes, both for teachers and students, with more activities focusing on creativity and inquiry. VASCSC is coming up with 'Innovation Hub' supported by NCSM, GoI. Since long, we have been discussing the idea of evolving VASCSC as a go-to place for exploring innovative ideas. Its facilities are already being used by people to enjoy and understand more about Science and Mathematics, which arises from the Centre's mandate of developing scientific temper. The Innovation Hub will provide added opportunity for students to tinker, to create and to explore and develop themselves into innovators for life. With support from Oracle, a new project 'Innovation in Science and Mathematics Education' was initiated. The project stayed true to its objective of developing spirit of innovation and creativity, impacting over 51000 student and teacher participants.

VASCSC has once again, successfully handled the challenging task of coordinating the eighth phase of Science Express, being run as 'Science Express Climate Action Special (SECAS)'. Till eighth phase, Science Express received over 15.6 million visitors and proved itself as an effective medium for mass outreach. VASCSC has been instrumental in the huge popularity and success of the project since its inception in 2007. The Science Express has embarked on its ninth phase. I am sure that this time too, it will conquer new heights in field of Science communication. With each phase, a new pool of Science Communicators is also being created. This is adding to the country's human resource in a very specialized field. The Science Communicators from previous phases are acting as knowledge hubs in their locations and reaching out to even more people, which is commendable. The partnership with IBM has continued over the years. Under this project VASCSC reached out to district level in Gujarat to familiarize teachers with innovative and hands-on approaches in STEM education. The participants have shared how these workshops have benefited them in their day-to-day teaching learning process.

I appreciate the exciting manner in which the VASCSC's team conducts the activities, which has resulted in increased demand and participation of children in its programmes. This is reflected by the popularity of School Science Forum and Summer Programme. Some noteworthy initiatives were undertaken for children from underprivileged and remote locations which enable them to access quality Science education. The Centre should now gauge the impact of these long term programmes qualitatively.

The Centre should proactively focus on fundraising as a tool to achieve financial independence, which will enable it to scale up and also undertake more innovative projects. To ensure scaling up and success, it should focus on improving its national, global and digital presence, and strive towards greater financial independence. It needs to scale up its activities to increase the reach and impact. I am happy that it has broadened its network and is working with several project partners, both from private and government sectors. The collaborations have helped it to mobilize resources to undertake more innovative projects and reach out to more people. Its presence on social media has increased considerably. VASCSC should now focus on digitalizing its content and making it available online.

I extend my congratulations and best wishes to the Director and team for putting in their best efforts which has resulted in the Centre's success in terms of variety and quality of programmes and financial stability. I would like to thank all the board members, project partners, well-wishers, students and teachers for their consistent support. I look forward to the Centre achieving greater success in the coming years.

Sam Pitroda
Chairman, Board of Governors, VASCSC

From the Director's Desk

We are happy to present VASCSC's Annual Report for 2016-17. It is a proud moment for us as the Centre completes 50 years of excellence in Science education and is ready for more! No words can describe the respect we feel for Centre's Founder - Dr. Vikram Sarabhai whose vision has brought us this far. We are also indebted to the Science stalwarts who provided their valuable guidance and the Centre's team working tirelessly to realize Dr. Sarabhai's vision. We seek everyone's best wishes to continue with more passion and enthusiasm.

This report highlights the efforts made by VASCSC for making science interesting and accessible. We are glad that our efforts for popularizing and improving the quality of Science education have been well-received. VASCSC's activities have always focused on 'creativity' and 'innovation'. This is now being taken further through the 'Innovation Hub' project, supported by National Council of Science Museums, Govt. of India. The development of Centre's infrastructure, including expansion of existing building, is reinforcing its efforts to provide a go-to facility where children can tinker and create. The activities conducted under this initiative, hand-in-hand with the newer resources and facilities, aim to provide an encouraging and enabling environment to children, in order to develop their creativity and spirit of inquiry. The Centre has initiated some interesting programmes focusing on innovation in Science and Mathematics education. With support from Oracle, a multi-pronged approach was used to reach out to several target groups from different educational and economic backgrounds, to ingrain spirit of innovation. Around 50,000 students, 1700 teachers from 580+ schools participated in different activities under this programme. Innovation Fair was one of the components of this project, which gave a unique opportunity to showcase innovative work in Science and Mathematics education.

VASCSC successfully managed the Science Express Climate Action Special (SECAS I), the 8th phase of the mega Science Outreach initiative, Science Express. Following its success, NCSTC, Dept. of Science & Technology, Govt. of India once again entrusted VASCSC with responsibility of managing the 9th phase as SECAS II which will run till 8 Sep 2017. The exhibition aboard SECAS II focuses on Climate Change, Science & Technology and will reach out to diverse groups through the exhibition and activities. SE has so far received 15.6 million visitors across India over its 8 phases!

For professional development of teachers, training workshops were conducted to help in effectively transacting Science and Maths concepts through hands-on methodology. Resource material was provided to the schools, to compliment the orientation. Over 2000 teachers benefited from training workshops offered by VASCSC, with support of several partners. 27 more STEM Training Workshops, supported by IBM were conducted across Gujarat. 6 workshops supported by Oracle, received participants from around the country. Development of new TLM and transadaptation of existing content was done for benefit of teachers. AIF supported workshops for their educators working in remote locations. With support from RMSA J&K, workshops were conducted for their Master Resource Persons. Scholars from Fulbright-Hays Seminars Abroad programme spent time at the Centre and a good exchange of ideas happened.

Activities focusing on developing children's interest and understanding of Science and Mathematics were conducted. The annual School Science Forum programme for students to understand curriculum-based concepts through practical inputs, is running strong in its sixth year, with new batches being launched. On one end, Summer Programme gave a chance to explore Science with fun while on the other, Advanced B.Sc. encouraged students to pursue higher education in Science. Some unique activities were conducted to reach out to the unreached. With support from Vigyan Prasar, *Shala Vigyan Melas* were organized for tribal students in far-flung locations in Valsad dist. Underprivileged students from Ahmedabad participated in week-long 'Science School', supported by KHS. With support from Dr. Sureshbhai D. Bhatt Charitable Trust, year-long interventions at Ambli Primary School were continued for improvement in Science, Math and Computer education. Workshops at Amdavad National Bookfair by AMC and School Outreach were some other initiatives. The Centre developed radio programme on 'Understanding and Managing Disasters', in collaboration with Vigyan Prasar and AIR, reaching out to wider audience.

All our activities were possible due to efforts of many people. I would like to thank Chairman Shri Sam Pitroda and all the Board Members for their invaluable inputs, support and guidance. I would also like to thank all our project partners, teachers, students and well-wishers, who have in many ways contributed to Centre's efforts in popularizing Science.

Dilip Surkar
Executive Director, VASCSC

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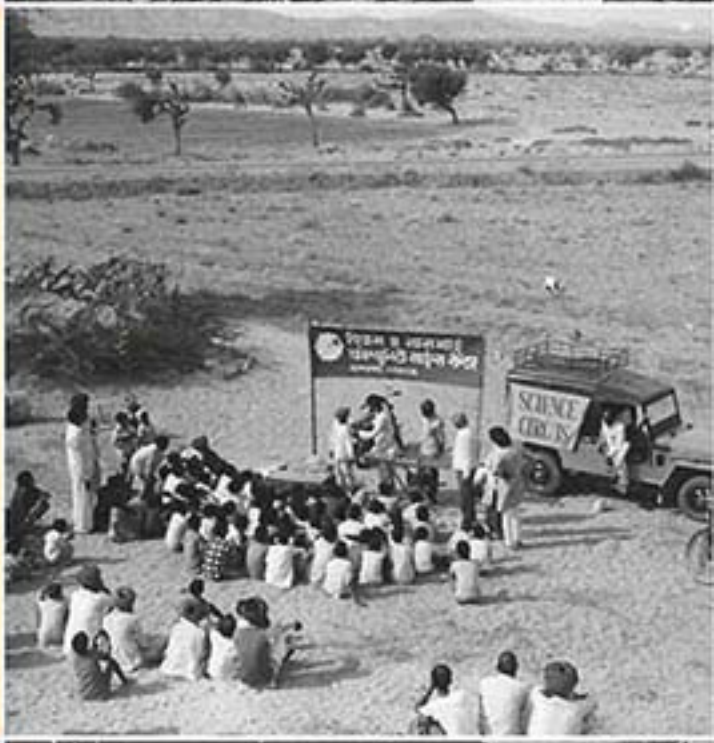


I Introduction

Vikram A Sarabhai Community Science Centre (VASCSC) is a pioneering Community Science Centre, founded by India's renowned scientist, Dr. Vikram A. Sarabhai on 1 June 1966 to encourage scientific thinking and innovative science teaching.

VASCSC started as a facility where people concerned about quality of science education could come together to try out new ideas and methods for teaching Science. With its origin as 'Group for Improvement of Science Education (GISE)' in 1963 from Physical Research Laboratory, Ahmedabad; the Centre initially named as 'Community Science Centre' has evolved a long way to the present times. The Centre was renamed as 'Vikram A Sarabhai Community Science Centre', to associate its name with that of its founder in 1971 after his sad demise.

The Centre crossed a major milestone in 2016 as it completed 50 glorious years of reaching out and bringing Science closer to the society. With guidance of the visionaries and efforts of the Centre's team members, it has successfully fulfilled its mandate of promoting among students, teachers and lay public

- An understanding of fundamental concepts in Sciences and Mathematics
- Acquire scientific knowledge by the process of inquiry
- Stimulate interest, encourage and expose the principles of science and scientific method
- Be concerned with the role of education and ways of improving education in relation to the individual and the community as a whole
- To make clear the social implication of Science and Technology.

The core of the Centre's philosophy is to take school and college students out of the rigid framework of textbooks and encourage them to think, explore and create. Over the years, the Centre has combined formal and non-formal techniques of education to formulate many innovative methods to give students a better understanding of Science and Mathematics, which not only make the process of learning enjoyable but also sustainable and long-lasting.

The Centre's mandate of spreading the joy of science by reaching out to different segments of the community is best illustrated by the Centre's logo. The five arrowheads in the logo represent groups comprising teachers, students, research workers, administrators and the community, while VASCSC is represented by 'Delta' - the mathematical symbol for change. VASCSC aims to bring about change by providing a common platform to all these groups.

The Centre has several facilities for participants to explore the various dimensions of Science and Mathematics. The Centre houses well-equipped laboratories of Biology, Chemistry, Physics, Electronics, Model Rocketry, Mathematics & Computer; Innovation Hub; Science Playground; Library; Science Hobby Workshop & Science Shop.

VASCSC has to its credit a number of firsts which include interactive exhibition space, open labs, Mathematics Laboratory, Science Playground, active use of computers in science education and developing interactive educational programmes; most of which are a part of mainstream today.

The Centre's efforts for improving the quality of science education and popularization have received recognition from several agencies. Some of the awards received by VASCSC include the following:

- National Award for Outstanding Efforts in Science and Technology Communication' from Department of Science and Technology, NCSTC, Govt. of India in 2008.
- The 'Times of India Social Impact Award' for Education in 2011.

The Annual Programme of VASCSC caters to school children to develop interest and nurture their curiosity towards science. School children usually find these subjects difficult or uninteresting due to lack of practical exposure and remoteness from their everyday life experiences. This programme is based on inquiry and creativity. Here, Science and Mathematics are presented to children in a simple and engaging manner. The connection between Science that the children learn in their classroom and their daily life experiences are made clear, providing quality Science learning experience to the children. Science concepts from curriculum or even outside of it are demystified using effective methodologies like demonstrations, experiments, projects, hands-on activities, science shows, film shows, AV techniques, etc. Thus, the programme orients school children towards Science. The following activities were conducted under the Annual Programme in 2016-17:

Open House

Open House programme has given an opportunity to children, teachers and laypeople interested in Science and Mathematics, to explore its various facets. This is done either independently or with guidance from the educators at the Centre. Visitors can avail benefit of the Centre's facilities through the Open House programme. The Centre's Quadrangle; Innovation Hub; laboratories viz. Biology, Physics, Chemistry, Computers, Electronics, Model Rocketry, Mathematics; and the Science Playground are freely accessible to people of all age groups. The Centre's library can be used for reading and for using the reference books for study or for project activities. A collection of interactive exhibits, models, teaching aids and experiments are showcased in the Quadrangle, Innovation Hub space and laboratories which are regularly used by the visitors, students enrolled in programmes and parents.

School Visits

The School Visit programme is conducted for school groups visiting the Centre. The visit is made more meaningful by orientating them to innovations and promoting innovative thinking. A dedicated team facilitates the school visits and conducts specially designed session for them. A Science Show consisting of demonstrations, experiments, hands-on and group activities, games, innovative TLM, film, talk, etc. is conducted for the group. This is followed by the exposure of students to Centre's labs and other facilities including Innovation Hub and Science Playground. Students are exposed to the interesting facets of Science. The sessions are aimed at creating their interest in Science and improving their understanding of various concepts. The students are introduced to the activities of the Centre and encouraged to participate in the regular programmes. Many times, informative takeaway material is also provided to the children or their teachers.

Educational visit to VASCSC is a regular feature in many local schools' educational visit plan. Students are excited to visit the Centre and go back with scientific inputs. It has been seen that many students who visit the Centre as part of their school group, visit again on their own and eventually start participating in the Centre's activities and events.

In the reporting year, school groups from Ahmedabad as well as other places also visited the Centre. The visiting students belonged to different grades right from pre-school to higher secondary. Several college and institution groups also visited the Centre and they

too were engaged in interactive sessions according to their level. Around 6200 students and 350 teachers from 101 schools visited the Centre during the year, as a part of the School Visit programme.

Student Visits

The Centre's laboratories are well-equipped to conduct school level experiments. Students utilize the lab facilities to perform curricular and also, extracurricular experiments. This is classified as Student Visits where students visit individually to perform practicals and investigatory projects. Necessary equipment, material and guidance are provided to students for their school projects, science fair projects and for trying out innovative ideas. The number of students comming to the Centre for school projects and science fair projects has increased over the years. Many times, children and teachers perform investigatory activities on their own in the labs. These activities include experiments from school curriculum as well as participants' own ideas, facilitated by the Centre's educators. Over 5100 students from different schools performed curriculum-based practicals and projects in the Centre's Biology, Chemistry, Physics, Electronics and Mathematics laboratories.

National Olympiad Test

The National Standard Examinations for National Olympiad conducted by Indian Association of Physics Teachers (IAPT) were held at VASCSC on 27 Nov 2016. 330 students appeared for the exams held for Physics, Chemistry, Biology and Astronomy.

Computer Training Programme

This programme was conducted around the year for teachers to build their professional capacities. It was based on school curriculum and hence, useful to the teachers in their regular teaching. 'Fun with Computer' workshops were conducted for kids while some workshops were targeted at general people including stay-at-home ladies, senior citizens, etc.

Workshops for Students

Workshops at ANBF 2016

VASCSC team conducted Science Workshop for children during 1-7 May 2016 as part of Amdavad National Book Fair (ANBF 2016), Ahmedabad. The event was open for children from age 6 to 15 years. Due to summer vacation time, overwhelming participation was received including students who came with their parents and groups from municipal schools also participated. More than 1000 children participated in the workshop over the seven days.

One and half hour sessions were conducted on all days in which the children enjoyed making science toys, models and puzzles. The activities included demonstration of Physics, Chemistry, Biology and Mathematics based activities and interactive models, making models based on principles such as Centre of Gravity, Newton's third law of motion, Sound, Waves, Optical Illusion, making Mathematical puzzles and solving them, Paper plane making and launching, Science and Green Games, Science magic tricks, making a Science puzzle, making Science toys, Open Quiz and demonstration of 'fun' experiments. The children enjoyed the activities due to the added fun element. They were excited as they got to take away the toys and models that they prepared.

Activity at Army Cantt.

VASCSC team conducted a half-day fun-filled session for children of Indian Army personnel at Army Cantt., Ahmedabad on 17 May 2016. Around 75 children participated and enjoyed science with fun. The activity comprised demonstrations, games and puzzles and the young participants also made a science toy.

Model Rocketry Workshop

VASCSC conducted three Model Rocketry Workshops at IITRAM, Ahmedabad during 19-26 Aug 2016. 150 students from the institute made and launched PET Bottle Water Booster and PVC type Water Booster Model Rockets. They were oriented on various concepts of Physics and Aerodynamics associated with Model Rocketry.

Activity at Vibrant Gujarat

VASCSC was invited to set up an Activity Corner at Vibrant Gujarat Global 2017 at Gandhinagar, Gujarat during 10-13 Jan 2017. The Centre's team conducted Mathematics with fun sessions for school and college students as well as other visitors to the exhibition. A number of models, TLM, puzzles, exhibition panels on Science Express, etc. were displayed by the Centre. Over 5000 visitors enjoyed the activities conducted at the Activity Corner.

Workshops under INSPIRE Programme

VASCSC team conducted Science and Mathematics sessions during 28-29 Dec 2016 at VelTech University, Chennai. The objective of the workshop was to orient the students of std. 10-11 participating in INSPIRE programme of DST, Govt. of India. 150 meritorious students participated in the workshops.

Observances

Mercury Transit Viewing

The Centre's team conducted viewing of the celestial phenomenon of Mercury Transit on 9 May 2016. Visitors were provided with information about this scientific event, how it occurs and viewed the event through telescope. A number of people including children turned up at the event.

WED 2016

VASCSC team and children celebrated the World Environment Day 2016 on 5 June 2016 through fun-filled activities like Quiz, Puppet Show, Green Games, Green Tattoo, sapling distribution, drama, film show, etc. Quiz winners were awarded prizes. Those present made a pledge to reduce their carbon footprint. Children also planted saplings in VASCSC premises.

50 Years of VASCSC

A get-together was organized on 1 June 2016 to commemorate VASCSC's turning 50. Centre's BoG members, many past and present team members and members from its sister organizations gathered on this auspicious occasion. They reminisced the glorious journey and paid respect to the visionaries under whose guidance the Centre has evolved, as well as the team whose efforts have borne fruit. This day marked the beginning of year-long golden jubilee celebrations. Shri Kartikeya Sarabhai, Ms. Mallika Sarabhai, Dr. Anamik Shah, Dr. Bharat Pathak and Shri Dilip Surkar graced the occasion and spoke about the history, milestones and vision of the Centre. The event concluded with hope for a bright future of the institute.

Dr. Vikram Sarabhai's Birth Anniversary

VASCSC team paid homage to Dr. Vikram Sarabhai on occasion of his 97th birth anniversary on 12 Aug 2016. Shri Kartikeya Sarabhai, Shri Dilip Surkar and school children paid their respects. The occasion was made special by presence of over 100 school children and teachers from Diwan Ballubhai School. Shri Kartikeya Sarabhai interacted with children on the occasion and reminisced Dr. Vikram Sarabhai. Later on, interactive Science and Mathematics sessions were conducted for the group.

Some Unique Facilities

Library Programme

The Centre's library houses a collection of Science and Mathematics reference books. These books include books for children as well as advanced reference material for high school and college students, who have been using this facility regularly. The library is continuously upgraded with new collections and reference materials for its young readers. It has been an effective resource for educators to update themselves.

Science Shop

The Centre's staff is continuously engaged in development of new and innovative Science and Mathematics TLM. This material includes publications, kits and models. The Centre's Science Shop makes this material available to the public. An attractive brochure-cum-price list was brought out for wider publicity. The material available at Science Shop was popular among student and teachers and received demand from schools across the country.

Geometry Club

The activity of Geometry Club at VASCSC, started by Prof. A. R. Rao, about 15 years back has continued uninterruptedly even after his passing away in 2011, thanks to the enthusiasm and interest of the club members. Several dedicated geometry enthusiasts meet every Saturday, throughout the year at VASCSC. The club participants discuss interesting geometrical results and solve challenging problems. The group comprises of people from fields as diverse as teaching, banking, engineering and medicine.

Radio Programme

A 26 episode radio series in Gujarati titled *Jagine jou toh* was developed based on the theme 'Understanding and Managing Disasters' with the support of All India Radio and Vigyan Prasar, New Delhi. The programme started on 13 June 2016 and concluded on 12 Dec 2016. It was broadcast from Akashvani's Ahmedabad, Vadodara, Rajkot, Bhuj and Godhra stations every Monday during 9:30 - 10:00 pm (MW 846 KHz). At the end of each episode, a question was posed to the listeners. The best answers were awarded prizes.

III School Science Forum

The School Science Forum (SSF) programme successfully entered into its sixth year. The SSF is one of the most popular programmes of the Centre, offered for students of Std. 5 to 9. It is a syllabus oriented, year-long programme. It has been observed that most participants have enrolled themselves during successive years, as they have benefited by gaining better understanding of curriculum-based Science and Mathematics concepts. Participation in SSF has helped them in enjoying the study of these subjects at school with increased confidence.

The SSF focuses on making the learning of Science and Mathematics interesting and engaging for school children. Experiments and activities form an integral part of the sessions conducted in the Centre's various labs, as a means to strengthen the basic concepts. Sessions based on Biology, Chemistry, Physics, Mathematics, Electronics, Computers, Environment, Science Project Making, Astronomy, Model Rocketry, Environment, etc. are included to provide holistic understanding and to give an idea regarding the interdisciplinary nature of Science. The interactive sessions give the participants a platform to share their ideas, develop scientific temper, boost their confidence and foster in them a positive attitude towards learning Science and Mathematics. It complements the input that the students get from their school and hence, reinforces their learning. As SSF is spread over an academic year, sustained efforts can be made by the Centre's team and ample time is available for the students to explore and understand concepts. The sessions are conducted in both English and Gujarati.

In the academic year 2016-17, School Science Forum was conducted during 28 Jun 2016 - 26 Feb 2017. For each standard, 30 sessions of one and half hours duration were conducted, which covered curricular topics that required practical input as well as educational visits. In addition to the sessions, educational visits were conducted for providing exposure to topics such as astronomy, environment, bird watching, etc.

Day	No. of Batches of SSF				
	Std. 5	Std. 6	Std. 7	Std. 8	Std. 9
Tue	2	2	2	2	-
Wed	1	1	1	1	1
Thu	2	2	2	2	1
Fri	1	1	1	1	1
Sat	2	2	2	2	2
Sun	2	2	2	2	1

As a result of the overwhelming response from students, new batches were launched in 2016-17. 840 students from different schools of Ahmedabad enrolled in SSF. The concepts learnt as a part of the programme have been of immense help to them in dealing with their school curriculum.

Summer Programme

Summer Programme is conducted during the school summer break and is a much sought-after programme of the Centre. The programme modules are designed such that children engage in Science activities with fun, in a conducive surrounding of the Centre's labs. The modules based on Science, Mathematics and Computers are imparted through hands-on activities.

The Summer Programme 2016 was conducted during 19 April-12 June 2016. The children were offered a choice from 138 batches of 36 different modules for participation. Additionally, Astronight session was conducted for Astronomy programme participants on 14 May 2016. The response to the Summer Programme was excellent, with around 2400 participants in various modules. Several participants came from places other than Ahmedabad.

The programme schedule was compiled in a brochure & distributed to ensure wide dissemination of information and larger participation. The programme information was displayed on the Centre's website, social media and notice board. A good amount of publicity happened through the word of mouth, the reason being the positive experiences of participants from previous years.

The programme modules were based on Astronomy, Biology, Chemistry, Computers, Electronics, Mathematics, Model Rocketry, Physics, Science Hobby, General Science, Robotics, Innovations, Photography and other such interesting themes. The modules were specially designed such that the participants got an opportunity to individually explore, create and learn through activities, experiments, model-making, games, outdoor trips, etc. Some new modules offering creative and

engaging activities were introduced, including those targeting Sr. KG students and parents. The programme catered to age groups starting from three years onwards. Each module was typically of 1-2 weeks' duration and gave participants fairly good time span to involve in activities based on their interest. The list of the modules offered under Summer Programme is given in table on the following page.

Advanced B.Sc. (Physics)

With the objective of motivating students of Physics towards higher studies and research, VASCSC jointly with Gujarat Science Academy and St. Xavier's College organized 'Advanced B.Sc. (Physics)' Summer Programme 2016.

This residential programme was conducted during 6 - 26 May 2016 at St. Xavier's College, Ahmedabad. It was primarily meant for students studying in their second year of B.Sc. with Physics as a subject. The programme aimed at providing a firm background in Physics. The course was taught by scientists from research institutions including Physical Research Laboratory (PRL) and Institute for Plasma research (IPR), using methodologies like assignments, problem solving, presentations, tests, career guidance, visit to research institutes and talks by eminent scientists. 33 students from science colleges of Gujarat were enrolled in the programme after undergoing a tough selection process.

The Advanced B. Sc. programme was initiated in 2003. Since then, it has been beneficial in shaping the future of students. Several alumni are pursuing higher studies in some of the best Science and Technology institutes of India while some are working as scientists in research institutes in Physics and allied subjects.

Module	Age Group	Duration	No. of Batches
Astronomy			
Know our Universe	Std. 6 - 8	1 week	2
Biology			
Little Scientist	Std. 1 - 3	1 week	7
Microscopic Exploration	Std. 5 - 7	1 week	3
Biology Investigation	Std. 8 - 12	1 week	2
Science Exploration	Std. 4 - 6	1 week	2
Chemistry			
Chem 4 Kids	Std. 1 - 4	1 week	8
Fun with Chemistry	Std. 5 - 7	1 week	6
Chemistry Investigations	Std. 8 - 10	1 week	2
Computers			
Fun with Computer	Std. 1 - 3	1 week	8
Learning with LOGO	Std. 3 - 4	1 week	5
Picture Editing	Std. 5 - 7	1 week	3
Animation for Kids	Std. 6 - 8	1 week	3
Fun with Visual Programming	Std. 5 - 7	1 week	3
3D Modeling with Sketch Up	Std. 5 - 7	1 week	2
Electronics			
Electronics World	Std. 7 - 9	1 week	4
Mathematics			
Fun with Maths 1	Std. 4 - 5	1 week	8
Fun with Maths 2	Std. 2 - 3	1 week	5
Enjoy Maths	Std. 6 - 7	1 week	3
Young Mathematician	Std. 8 - 9	1 week	2
Programme for Parents	Parents with kids in Play group - UKG	2 days	1
Model Rocketry			
Young Rocketeers (Single Stage)	Std. 6 - 7	1 week	3
Young Rocketeers (Water Booster)	Std. 5 - 6	1 week	5
Young Rocketeers (Cluster Engine)	Std. 7 - 9	1 week	1
Physics			
Fun with Physics - Juniors	Std. 5 - 6	1 week	4
Fun with Physics - Seniors	Std. 7 - 9	1 week	4
Robotics			
Robotics Module - I	Std. 6 - 7	1 week	4
Robotics Module - II	Std. 7 - 9	1 week	4
Robotics Module - III	Std. 8 - 12	1 week	2
General Science			
Explore and Learn	Std. 3 -4	1 week	6
Learn Photography	Std. 5 & above	1 week	5
Science Kindergarten	Std. Sr. KG	1 week	2
Science Funday - Juniors	Std. 2 - 4	3 hours	3
Science Funday - Seniors	Std. 5 - 8	3 hours	2
Science Hobby Workshop	Std. 1 - 3	1 week	7
Summer Science School	Std. 5 - 6	2 weeks	3
Calligraphy	Std. 2 - 5	1 week	4

Innovation Hub

VASCSC initiated the process of setting up an Innovation Club at its premises and simultaneously started conducting activities under its various components. This project is supported by the National Council of Science Museums (NCSM), Ministry of Culture, Govt. of India under the 'Scheme for Promoting Innovation, Creativity and Engagement in Sciences (SPICES)'.

Since a long time, VASCSC has been carrying out innovative activities to improve the quality of Science education and also promote a culture of innovation and creativity. Under this Project, extension of these activities and scaling up is also planned. The Project has provision for setting up new spaces for users to tinker, explore, try out new ideas and innovate. In addition, the Hub is expected to be vibrant with activities focusing on innovation and creativity. This facility can be utilized by students, teachers and others who would like to explore their innovative ideas and has components like Discovery Hall, Innovation Resource Centre & Hall of Fame, Idea Lab (*Tod Fod Jod Corner, Kabaad se Jugaad Corner, Idea Box)* and Design Studio. The activities conducted under various components of Innovation Hub are given below:

Model Rocketry: Model Rocketry has been a regular activity at the Centre. Through this activity, participants are exposed to the basics of Rocket Science and Physics behind them. They are encouraged to fabricate and launch simple rockets, measure their performance and experiment with new designs. This year, new designs of model rockets were developed for children viz. Paper rocket, Arrow rocket and Matchbox rocket which can be made from simple material. Students enjoyed making and launching the model rockets. This motivates them to generate innovative ideas to develop and design new products. Several educational kits were also developed viz. Air propelled rocket kit, Solid fuel propelled rocket kit (Single stage, Cluster) and Water propelled rocket kit. New launch pads were developed to enable controlled launch of the rocket. In this, the rocket can be pressurized to a varying degree of pressure from 40 psi to 80 psi so that students can collect data with different pressure values, measure heights achieved by the rocket and perform various calculations.

New Exhibits Development: The work on developing the Discovery Hall was completed. New exhibits were designed, developed and put up for display in the Discovery hall. This includes interactive science exhibits like Balancing Nail Puzzle, Height Measurement, Wave pendulum as well as large size panel exhibition on Biogeochemical Cycles, Periodic Table, Astronomy, Optical illusions, Our Solar System, Comparison of bones of human, whale, cat and bird and Human skeleton typogram.

Innovative Teaching Learning Material: TLM including Biogeochemical cycles kit, Water testing kit, soil testing kit, Light kit, Magnet kit and Innovative mathematical models and puzzles are being developed as part of the Innovation Hub activity. An interactive Science Hobby Workshop manual with interesting, fun filled, easy and safe to do hands-on science activities for children is being developed. The content of this manual has an activity approach which enhances the child's ability to think critically and motivates them to make innovative science models.

Hall of Fame: The contributions of scientists including Dr. Vikram Sarabhai, Dr. C V Raman, S Ramanujan, Dr. S Chandrashekhar, Dr. J C Bose, Sir Isaac Newton, etc. have been identified to be showcased in the Hall of Fame. Work on content development for the same in regional language is under progress. A poster set on Eminent Mathematicians developed by VASCSC in English and Gujarati is being used in several activities to make students aware about innovative research and discovery done by these great people.

Kabad se Jugaad Corner: Sessions were conducted where children learnt to turn trash into simple science models and toys. It inspires them to see the waste differently and to think about how they can reuse waste in creative and innovative ways. In this workshop students made toys and gadgets such as Balloon powered toy car, Straw petal fan, Yo-Yo, Coupled pendulum , Solar Oven, Wind wheel, Static electricity models, Origami, etc. from simple and easily available materials.

Teachers' Training Workshops: Six Teachers Training Workshops were conducted with support from Oracle, to promote innovative methods in Science and Mathematics teaching, These workshops were conducted in the Innovation Hub and received 301 teacher participants who took the learning back to their classroom.

School Visit to VASCSC: To introduce the innovative activities of the Centre and encourage students to participate in the Innovation Hub activities, School Visit programme was conducted for school groups. During these visits, a Science Show was conducted. The students were given orientation on topics like : What is Innovation, its importance, developing innovative thinking, innovations by common people, problem solving, Design thinking, eminent scientists & their inventions, etc. Experiments, demonstrations and hands-on activities in Science and Mathematics was conducted. Learning aids prepared from waste material were demonstrated before the students. The students then spend interactive time in the Discovery Hall and Science Playground, followed by exposure visit to labs. Around 6200 students and 350 teachers from 101 schools experiences these activities.

Outreach Programme: To engage kids in quality learning experiences that will develop their interest and abilities in Science and Mathematics, VASCSC conducted Innovation Outreach Programmes, supported by Oracle. 32215 students and 908 teachers from 101 schools participated. Children were also introduced to the activities of the Centre and encouraged to leverage the facilities of the same.

Summer Programme: With an aim to promote innovation among students in a fun- filled, enjoyable manner; and to nurture young minds and direct them towards scientific thinking, VASCSC organized the Summer Programme during 19 Apr - 12 June 2016 which received over 2400 participants from various age groups. The modules were developed to initiate young minds into the world of Science, Mathematics and Computers through hands-on activities and also promote independent thinking, problem solving ability and generation of innovative ideas.

Modules were based on Astronomy, Biology, Chemistry, Computers, Electronics, Mathematics, Model Rocketry, Physics, Science Hobby Workshop, Robotics and Photography. Some activities therein focused on using waste material for creating new products (*Kabad se Jugaad*) while some focused on developing new ideas, design and fabrication of gadgets, tinkering (Idea Lab & Design Studio).

Innovation Fair: A 3-day Innovation Fair was conducted at VASCSC during 28 Feb - 2 Mar 2017 to give an opportunity to innovators who are working on some innovative idea, concept, product or TLM in Science and Mathematics education. The event aimed at nurturing the curiosity of common people in the fields of Science and Maths, through fun experience. Exciting competitions, science talks, exhibitions and many other activities were conducted for teachers and students of different age groups. 7100 students, 85 teachers from 216 schools participated.

Innovation Clubs: VASCSC set up Innovation Clubs in 30 schools in and around Ahmedabad. Resource material and necessary hand-holding was provided to the schools round the year. The Clubs provided a platform for trying out new ideas, foster innovation & nurture creativity among students. Innovation Clubs showcased their projects at the Innovation Fair. 4248 students and 60 teachers benefited from this initiative.

With support from Oracle, VASCSC initiated a new project 'Innovation in Science and Mathematics Education' with the objective to develop the spirit of innovation and creativity among students & teachers.

Table: Project Outcome (in numbers)

Programme	Schools	Students	Teachers
Outreach Programme	101	32215	908
Group Visits to VASCSC	101	6154	352
Teachers Workshops	135	-	301
Innovation Clubs	30	4248	60
Innovation Fair	216	7100	85
Total Beneficiaries	**583**	**49717**	**1706**

Project Components

1. Outreach Programme in Schools

Students in the rural areas or far flung places cannot go to centres of science education due to several reasons and hence, have little or no access to it. The aim of this intervention was to provide students an opportunity to know interesting scientific facts, phenomena and the latest happenings in the field of science right at their doorsteps i.e. their schools .

VASCSC resource persons visited schools and conducted 2-3 hours sessions comprising innovative Science and Mathematics hands-on activities, demonstrations and provided some useful TLM to the schools. Activities were conducted based on the level of the students. Students were provided orientation on Innovation, followed by activities & demonstration of Teaching Learning Material. Some of the models demonstrated and hands-on activities included Magic breath, DNA model, magnetic levitation, centripetal, centrifugal force, elasticity, Newton's laws of motion, types of motion, sound, Newton's cradle, binary cards, surface tension, Who Am I game to understand about classification of living organisms, interactive mathematics games and puzzles like Brahma's tower, pegboard puzzle, number puzzles, brachistochrone, algebraic identities, theorems, models related to area and perimeter, etc. Orientation to model rocketry and rocket launching was one of the most popular activities of this intervention. The Outreach Activity was conducted with 32215 students and 908 teachers from 101 schools.

2. Group Visits to VASCSC

The labs and facilities at VASCSC emphasizes on hands-on approach, featuring interactive exhibits that encourage visitors to experiment and explore. It is attempted to provide an opportunity to enhance children's learning by helping them to see that science is not simply about 'learning a fixed body of known facts' but it is also about the processes and skills necessary to discover these facts.

For school and institution groups visiting VASCSC, innovative, interactive and structured sessions of 2-3 hours' duration were conducted by Centre's resource persons. After the session, they were facilitated through the Science playground and interactive exhibits. Some topics covered in the sessions include motion, gravitation, light, sound, mathematics games and puzzles like Brahma's tower, Pegboard puzzle, number puzzles, algebraic identities, theorems, models related to area and perimeter, as well as experiments related to chemistry and biology. These fun-filled activities were conducted with the objective of developing students' interest towards Science. Through the activity based learning, difficult topics were presented in simple and interesting manner. 6154 students and 352 teachers from 101 schools visited the Centre and benefited from this activity.

3. Teachers Training Workshops

To build the capacity of Science and Mathematics teachers and educators and to orient them towards innovative approaches, six training workshops were conducted at VASCSC. These workshops were titled 'Innovative Approaches in Science and Mathematics Education' and received 301 participants from different parts of the country.

The schedule of the workshops was prepared keeping in mind the respective level. Standard appropriate Science and Maths hands-on activities were conducted in these workshops. At the end of the workshop, useful teaching learning material was provided to each participant. The details of the workshops conducted are given in the following table:

Date	Level	Theme	Participants
30 - 31 Aug 16	Std 6 - 8	Science & Math	56
15 - 16 Sep16	Std 8 - 10	Science & Math	36
4 - 5 Oct 16	Std 6 - 8	Science & Math	51
7 - 8 Oct 16	Std 8 - 10	Science & Math	51
1 - 2 Dec 16	Std. 6 - 8	Math	54
6 - 7 Dec 16	Std 6 - 8	Science	53
		Total No. of Participants	**301**

4. Development of Innovative TLM

Under this component, innovative resource material consisting TLM, publications, posters and model rocketry kits were developed. Prototype of 49 items was developed. Work was initiated on models and publications such as Static Electricity kit, Balancing Nails, Water Testing kit, Structure of Atom kit, Tap-Tap game - soft version, Moon phases, Histology kit, Hindi translation of 'Mathematical Models and Teaching Aids' and Periodic Table. Posters based on topics like Biogeochemical cycles, Food Chain, Solar System, Human Skeleton Typogram, Human Blood, Amazing Facts about Human Body, Microscope, Planet Earth, Optical Illusions, Astronomy, Mars, Science and Beliefs, Watching an Eclipse were developed. Design of Rocketry kits and also augmentation of the existing model rocket designs was undertaken. Development work was initiated for Air propelled rocket kit, Solid fuel propelled kit, Single stage kit, Cluster engine kit, Water propelled rockets kits, Inclinometer, Lever-based spring launcher, Holder-based launcher, booklet on Water booster rocket as science education resource and Rocket recovery mechanism.

5. Setting up Innovation Clubs

VASCSC provided support to schools for setting up their own Innovation Club, to provide a platform for trying out new ideas, fostering innovation and nurturing creativity among students. The club members got an opportunity to explore areas of science beyond the scope of curriculum. The Clubs provided ample scope for students to indulge in practical Science learning. Innovation Clubs were set up in 30 schools in and around Ahmedabad.

Initially an orientation session was organized for participating schools at VASCSC. A set of material was provided to each school to initiate an Innovation Club. The material included set of publications, teaching aids, posters, panels, games and puzzles and large scale interactive models. Guidance was provided on activities that could be conducted in their club. The Centre provided year-long support and hand-holding to the schools in conducting innovation activities.

6. Innovation Fair

VASCSC organized a three-day 'Innovation Fair' event during 28 Feb - 2 Mar 2017 to support innovators to showcase their innovation; be it idea, product or TLM; in Science and Mathematics education. Different competitions, exhibitions, workshops and other activities were conducted to popularize science education and to provide students, teachers and common people a platform to try out new ideas, foster innovation and nurture their creativity. 216 schools participated in the event.

The Innovation Fair was inaugurated on 28 Feb 2017 to coincide with National Science Day, which marks the discovery of Raman Effect by Dr. C. V. Raman. The inauguration event was graced by the presence of Dr. Kirit Solanki, Member of Parliament, Ahmedabad; Shri Kartikeya Sarabhai, Director, Centre for Environment Education; Shri Yatindra Sharma, Managing Director, KHS Machinery Pvt. Ltd., Shri Pradyumna Vyas, Director, National Institute of Design; Dr. Minal Sen, Scientist and Shri Dilip Surkar, Director, VASCSC.

This open for all initiative was an amalgamation of science fair, technology exhibition, interactive science workshops and community meet-up. It hosted demonstrations, displays and performances in Science and Mathematics. Competitions like Innovation Science Fair, Innovation Science Painting, Science Poster Presentation, Innovative idea in STEM education, Innovative TLM & Best out of Waste were conducted. Other event highlights were Do it yourself workshop, Interactive Science Corners, Science Talks, Science games, Astronight, Plastic handloom, Clay creations, Mathematical puzzles, Model Rocketry, Robotics and 3-D printing, to name a few.

Several agencies had set up stalls to showcase their work. These included IIT-G, Trikolaa Tech 3D Engineering Solution, GEER Foundation, GIAN, NIOH, ICMR, WOW, Vexma Technologies, Khamir, Dragonfly Farm, Jalsa Art, Penpals World Around You, Drona Aviation and Pluto - a drone for everyone. Innovation Club members also showcased their innovative science models in the Fair.

The winners of various competitions were awarded prizes during the Valediction held on 1 Mar 2017. Shri Tejas Bhandari, Asst. Municipal Commissioner, AMC; Dr. Bharat Pathak, Director, VIKSAT; Dr. Minal Sen; Ms. Niharika Shah, Gallery Director, Kanoria Centre for Arts and Shri Dilip Surkar, Director, VASCSC were present on the occasion and they encouraged the attendees to develop innovative thinking. The Fair received a footfall of over 7000 visitors with over 2000 registrations from 216 schools.

Science Express
Climate Action Special

Introduction

Science Express is a flagship programme of the Dept. of Science & Technology (DST), Govt. of India. It is an innovative mobile science exhibition mounted on a 16 coach AC train, traveling across India since Oct 2007. Science Express is the largest, the longest running and the most visited mobile science exhibition and has 12 entries in the Limca Book of Records. DST has entrusted VASCSC with the task of managing Science Express across India since its inception. VASCSC's team of Science Communicators traveling with the train, explain and interpret the exhibition, facilitate the visitors and conduct the complementary activities.

Till Mar 2016, Science Express completed eight phases across the country. Science Express Phase I to IV showcased cutting-edge research in Science and Technology being carried out worldwide. Phase V to VII were based on the theme of biodiversity. As 'Science Express Biodiversity Special (SEBS)', it showcased the rich biodiversity of India and its conservation measures. Phase VIII of Science Express as 'Science Express Climate Action Special (SECAS)' focused on Climate Change and Science & Technology.

SECAS I

Phase VIII of Science Express as 'Science Express Climate Action Special (SECAS)' focused on Climate Change and Science & Technology. SECAS (SE Phase VIII) was flagged off on 15 Oct 2015 and concluded its journey in the current year on 7 May 2016. During this journey spanning 19,800 km and 204 days, it made 64 halts where it received 23.24 lakh visitors. VASCSC successfully carried out its role as the implementing partner of this prestigious project.

SECAS II

The theme of Climate Change was well received from all quarters, which was clear from the tremendous response it received. Hence, the Science Express Phase IX was continued on the same theme, as SECAS II. The ninth phase tour started on 17 Feb 2017 and is scheduled to conclude on 8 Sep 2017during which it will be exhibited at around 74 stations across India, covering 19,000 km. Around 23 lakh visitors are expected in this phase. This project is a unique collaborative initiative of DST, Ministry of Environment,

Forest & Climate Change (MoEFCC), Dept. of Biotechnology (DBT) and Ministry of Railways, Govt. India, Wildlife Institute of India (WII) and VASCSC. SECAS aimed to contribute towards increasing understanding of the science of climate change, the observed & anticipated impacts and different possible responses and Innovations, Science & Technology.

SECAS II Flag off: SECAS II was flagged off on 17 Feb 2017 from Delhi Safdarjung Railway Station by Shri Suresh Prabhakar Prabhu, Hon'ble Minister of Railways (through video conferencing), Dr. Harsh Vardhan, Hon'ble Minister of Science & Technology and Earth Sciences and Shri Anil Madhav Dave, Hon'ble Minister of State (I/C) for Environment, Forest and Climate Change (MoEFCC), GoI. Dignitaries & officials from Indian Railways, DST, MoEFCC, DBT, CSIR, WII & VASCSC were present at the ceremony.

The Exhibition: The state-of-the-art exhibition aboard SECAS II aimed to create awareness among various sections of society, especially students, on how Climate Change can be combated through mitigation & adaptation. Out of 16 coaches of SECAS, MoEFCC had put up exhibition on various aspects of Climate Change, the underlying science, impacts, adaptation activities, mitigation solutions and policy approaches in a simple and interesting manner. Exhibition in coach 9 & 10 by DBT hosted exhibits on Biotechnology for bioresources & nature conservation and recent biotechnological advancements in India. Coach 11 by DST showcased Innovations in Science & Technology, augmented reality based model, Science Education, DST Scholarships & Schemes, Careers in S&T, etc. Coach 12 housed the Kids Zone where children of std. 5 & below could participate in fun-filled activities, games and puzzles in Science, Maths and Environment. Coach 13 housed the Joy of Science (JOS) Lab for students of std. 6-10 to perform experiments & activities to understand Science, Maths & Environment in interesting manner. A Discussion Centre-cum-training facility was also set up in this coach for orientation of teachers. As a new initiative, Solar Panels were installed on rooftop of coach 11-13 of SECAS as a positive action against climate change.

Reaching Out: The reach of SECAS was extended beyond the exhibition and the on-board interactive spaces through the On-platform & Outreach Activity, to reinforce the message of SECAS to diverse group of participants. The Platform activity was aimed to keep visitors engaged meaningfully while they awaited their turn to enter the train. Demonstrations, puzzles,

games, quiz, competitions, display panels, train exterior were used to impart SECAS's message. The SECAS team visited nearby schools and institutions to conduct Outreach activity. They took the students through the SECAS experience without actually visiting the train by making presentations, film screening, JOS/Kids Zone activities, etc. in the respective schools. Informative take-away material was made available for wider distribution amongst schools and visitors. In addition, the team conducted several activities to celebrate commemorative days. The focus in this phase was on 'Science behind Miracles' and related demonstrations were performed in the JOS lab, Platform activity, Outreach Activity and Teachers Training sessions.

Web Presence: A dedicated website and social media accounts of SECAS were created to connect to a wider audience. Through these, updates about the project and activities were made easily available.

- www.sciencexpress.in, www.scienceexpress.in
- www.sciencexpressphase7.wordpress.com/
- www.facebook.com/Science-Express-159008177473722/
- www.twitter.com/Science_Express
- YouTube channel
- SECAS 360° Virtual Tour

SECAS Statistics (Phase I - VIII)

- **Halts: 455**
- **Distance Traveled: 1.4 lakh km**
- **Exhibition Days: 1608**
- **Total Visitors: 15.6 million**
  - Schools: 38,081
  - Students: 34,71,962
  - Teachers: 1,84,656
  - General public: 1,06,25,600
- Students
  - in JOS Lab: 4,22,122
  - in Kids Zone: 1,78,105
  - in Platform Activity: 5,79,891
  - in Outreach Activity: 1,63,285
- Teachers Oriented: 7,414

VIII Shala Vigyan Mela

With support from Vigyan Prasar, VASCSC conducted *Shala Vigyan Mela* or School Science Festival for tribal students of Gujarat. The event was organized with objective of inculcating scientific temper among tribal students and to provide them with an enjoyable experience of learning the fundamentals of Science & Mathematics through fun-filled activities. The School Science Festival was conducted at five tribal schools in Valsad district of Gujarat during 4-10 Jan 2017.

VASCSC selected Valsad district in Gujarat having 54.8% tribal population, for conducting the *Shala Vigyan Mela*s. Due to the region's remoteness, the tribal students there are deprived of facilities and exposure to some of the educational events like Workshops, Seminars, Science Fairs, etc. Within Valsad district, a remote and hilly taluka - Kaprada was selected for conducting the *Shala Vigyan Mela*s.

The *Shala Vigyan Mela* highlighted the importance of learning in a festive environment that was created in the respective schools through different fun-filled activities and events. This festival was organized at Arunodaya Sarvajanik Vidyalaya, Shri Navsarjan High School, Ashram Shala Lavkar, Shree Vrindavan Ashram Shala and M. D. Sarvajanik High School. Among the five schools, three were high schools (std. 9-12) while two were *ashram shalas* with tribal students from std. 1-8. Additionally, the students from the nearby tribal schools viz. Sarkari Uchchatar Madhyamik Shala, Anand Niketan Eklavya Residential School and Prathamik Shala, Varvat were also invited to attend the Vigyan Melas. At each school, the *Mela* was organized for two days. It was planned on a specific theme to explore the concepts of Science through innovative and encouraging way.

The *Shala Vigyan Mela* started with inaugural function at Arunodaya Sarvajanik Vidyalaya on 4 Jan 2017. The Festival comprised competitions for students of different age groups, like Science Elocution, Science Skit, Science Bingo and Quiz, Science Painting, Best out of Waste, One minute game, Question of the Hour, etc. Open events like Science Talk, Science Show, Model Rocketry workshop, Science and Green games, Hands-on Activities, Model Making workshop, Career Counseling, Science Movie shows, etc. were conducted. Science exhibitions including those on Prominent Mathematicians, Astronomy, Dr. Vikram Sarabhai, interactive stalls including mathematical puzzles and games, etc. were put up. In addition to these events, VASCSC team also conducted community outreach activities during evening hours to engage and reach out to the local community in neighbouring area of the school. This comprised Science Shows for community, Astronights and Science Movie Shows.

The event concluded with a Valediction. The winners of the competitions were felicitated with a memento and certificate. Certificates were also given to the participants to encourage them in participating in such events in future. Each student was given Vigyan Drishti, a bimonthly science wall magazine. Each school was given a kit containing different publications and TLM for their library.

In all, the five *Shala Vigyan Melas* had participation from 2304 students and 47 teachers from 8 schools. The *Mela* dates of each school are as follows:

Date	Name of School	Location
4 - 5 Jan 17	Arunodaya Sarvajanik Vidyalaya	Kaprada
6 - 7 Jan 17	Shri Navsarjan High School	Varvat
6 - 7 Jan 17	Ashram Shala	Lavkar
9 - 10 Jan 17	Shree Vrindavan Ashram Shala	Khutli
9 - 10 Jan 17	M. D. Sarvajanik High School	Varoli

IX Ambli School Programme

With support from Dr. Sureshbhai D. Bhatt Charitable Trust, VASCSC continued its interventions at Ambli Primary School for the third consecutive year with the objective of improving quality of Science, Maths and Computer education. Efforts were made to increase Science awareness, create interest and provide a holistic learning, where the aim was to strengthen the basic concepts of Science, based on which higher learning could be attained by the students.

The project aimed to create interest in Science, Mathematics and Computer and build their conceptual understanding through hands-on approaches. A Science education-cum-activity centre was set up and teaching learning material was provided to school in 2015. This was the foundation on which activities are being continued since then.

Conducting Hands-on Sessions: The Centre's resource persons conducted sessions based on hands-on approaches for students of Std. 6 & 7, throughout the year. The children participated in the activities, experiments, model-making and learnt difficult Science concepts with ease. These sessions supplemented the ongoing input, that the students got from their school and reinforced their learning. The teachers also attended the sessions and were oriented towards the activities which they could replicate in their regular classroom teaching.

In all, 28 sessions of two hours each were conducted for each class during the year. These syllabus based activities were conducted by using a 'learning by doing' approach, thereby providing a hands-on experience and exposure to the students for learning of scientific concepts. The nature of the activities conducted here being co-curricular, a good participation was ensured.The sessions were aligned with school curriculum and the schedule was carefully prepared so as to complement the topics which were being addressed in their class at that point of time.

For Std. 6, topics covered included Perimeter and Area, Acid, Base and Salt, Living and Non-living, Simple Machines, Water, Integers, Conservation of Environment, Seed, Light, Algebra, Basic Astronomy, etc. For Std. 7, topics covered included Separation of Substances, Musculoskeletal System, Electricity, Air Pollution, Science with fun models, Food Chain, Lever, Elements, Compounds & Mixtures, Innovative Science Project, Power & Indices, Equations, Our Solar System, Visit to Innovation Fair, etc.

Science and Mathematics Club: Continuous guidance was given to the students and teachers for science fairs and projects. Apart from these, VASCSC provided some useful material to the school and guidance in setting up Innovation Club. VASCSC team conducted Astronight Programme for students at their school premises on 16 Dec 2016. The programme included a presentation on topics like

Astronomy, Our Solar System, Night Sky & short movies. This was followed by night sky watching where children learnt about celestial bodies, Moon, Pole Star, Constellations, etc. Students observed the surface of the Moon, Venus and Jupiter through telescope. 255 students from Std. 4+ and 12 teachers participated in the programme. Students and teachers also participated in the 'Innovation Fair' at VASCSC held during 28 Feb - 2 Mar 2017. Students took part in competitions, workshops, hands-on activities and talks. 15 student volunteers from the school provided their help in the programme. About 200 students of std. 6, 7 and 8 took part in the events.

Support for Computer Education: The school has several computers but absence of trained teachers to impart computer education was a challenge faced by the school. VASCSC provided additional support for making existing computers operational, accessible to the students and initiating the students into computer education. For this, one full time computer resource person and computer teacher were recruited and computer sessions were conducted for students of std. 6 & 7. Topics such as introduction to computers, software and hardware, using Open Office Writer (Text Editor), Tux typing, using Open Office Impress to prepare presentations, etc. were taken up.

X VASCSC Science School

With support from KHS Machinery Pvt. Ltd., the Centre conducted 'VASCSC Science School' programme for underprivileged children. The programme catered to students from Std. 6 - 8. The aim was to provide the students, who mostly came from municipal schools, a unique and first-of-its-kind learning experience. The VASCSC Science School focused on imparting difficult concepts in Science and Mathematics to the students in fun-filled manner as they lacked exposure to such activities. The children experienced practical learning to understand topics which they studied as a part of their curriculum. Two batches of the Science School were conducted.

This programme was a unique experience for the students as they were visiting a Science Centre and Science-Mathematics laboratories for the first time. Half day sessions were conducted for six days, giving the participants ample time to engage in hands-on activities. The participants were divided into smaller groups for one-to-one interaction. Interesting concepts from Science, Mathematics and Environment were transacted through experiments, demonstrations, hands-on activities, model-making, nature trail, games, quiz, power point presentations, videos, group work, discussion and interaction with eminent persons. At conclusion of the programme, the students were given certificates and resource material kit consisting of relevant publications for further reading.

Batch 1

The first batch of the Science School was conducted at VASCSC during 26 Sep - 1 Oct 2016. 100 children from Hirapur, Haraniyav, Bhitiya, Badodara, Rampura and Khant No Kuvo govt. primary schools from Ahmedabad participated in this six-day programme.

Each day, fun-filled hands-on Science & Mathematics sessions were conducted for the children in VASCSC labs. Students worked in small groups or individually. They performed experiments and activities as well as

made models based on various topics. The topics were correlated with school curriculum so that students could understand the difficult topics with fun and use the learning in their regular studies. They got the opportunity to perform experiments and activities in the Science labs and handle scientific equipment. The children also made and took back home models of Human Respiratory System, Pulleys, Lens Camera, Paper Rocket, Elements, compounds and mixtures, 2D & 3D shapes, Star Chart, etc. to understand the related concepts. They conducted experiments with water and soil, prepared paints, made microscopy slides, mathematics puzzles, model rockets, etc.

Shri Yatindra Sharma, MD, KHS Machinery Pvt. Ltd. and Shri Dilip Surkar, Director, VASCSC were present at the valediction. They encouraged the children by awarding them certificates and resource material set.

<u>Batch 2</u>

The second batch of Science School was conducted at VASCSC during 21-26 Nov 2016. In this batch, 111 students from Chandlodiya Primary School and Rajaram Vidya Vihar, Ahmedabad participated.

The children conducted experiments and activities as well as made models based on curriculum based topics such as Understanding Shapes, Water, Soil

Science, Human Body Systems, Simple Machines, Lens, Model Rocketry, Environment, Astronomy, Microscopy, Chemical Reactions, Elements, Mixtures & Compounds, Science Toys, Science Show and many more.

Shri Yatindra Sharma, Managing Director, KHS Machinery Pvt. Ltd.; Smt. Sarala Sharma, Trustee, Rajaram Viya Vihar; Shri Piyush Desai, Wagh Bakri Group; Shri Amitabh Shah, Yuva Unstoppable and Shri Dilip Surkar, Director, VASCSC were present at the valediction. The dignitaries encouraged the children by awarding them with certificates and resource material.

XI Capacity Building of Teachers

Capacity building is a major thrust area of the Centre's mandate. Many workshops and activities are undertaken by the Centre to motivate and empower individuals associated with the field of science education. The initiatives are targeted at orienting Science education professionals including school teachers, towards hands-on approaches in teaching. From time to time, the Centre organizes and conducts capacity building workshops and interactive sessions for school teachers and Science educators. These workshops promote innovative methods in Science teaching. Efforts are made to identify difficulties faced in Science teaching and develop remedial measures. The material developed addressing these difficulties, can be then utilized as a part of the classroom teaching. The aim is to build the confidence of educators for transacting Science and Mathematics concepts in their classroom effectively and developing interest and inclination of students towards Science. The following capacity building initiatives were conducted during 2016-17:

STEM Training for Teachers on Hands-on Approaches in Science & Mathematics Education

This project was initiated with the support of IBM India Pvt. Ltd in 2014 and since then, 2863 teachers from Gujarat have undergone the hands-on STEM training by VASCSC. The success of the project and its high demand from teachers lead to continuation of the project. It was planned to conduct more teachers training workshops in various districts of Gujarat to reach out to more teachers in this year as well.

Out of the 20 workshops planned to be conducted in the previous year, 9 were completed. The remaining 11 workshops were conducted in various districts of Gujarat in the financial year 2016-17.

The details of the workshops conducted from June - Aug 2016 are given in the following table:

S. No.	District	Workshop Date	Participants
	9 districts	Jan - June 16	437
1	Anand	22 - 23 June 16	52
2	Mahisagar	23 - 24 June 16	55
3	Morbi	7- 8 July 16	52
4	Vadodara	12 - 13 July 16	56
5	Ahmedabad(Rural)	14 - 15 July 16	46
6	Devbhoomi Dwarka	19 - 20 July 16	50
7	Jamnagar	21 - 22 July 16	44
8	Gir Somnath	26 - 27 July 16	55
9	Porbandar	28 - 29 July 16	47
10	Kheda	2 - 3 Aug 16	53
11	Aravalli	9 - 10 Aug 16	49
Total no. of teachers trained across Gujarat			**1003**

The main goal of the project was to develop awareness and interest among Science and Mathematics teachers to impart STEM training in an interesting and fun-filled manner through hands-on approaches, and to encourage them to use web based resources of TTS as a teaching aid. It was also aimed to promote the use of TTS website as an interactive platform amongst the Government school teachers for sharing their teaching experiences and innovative teaching learning methodologies in STEM.

The workshops involved three components - training, resource material dissemination and orientation on Teachers TryScience web resource. The two-day workshops consisted of Science and Mathematics sessions transacted through hands-on and demonstration methodology. Each participant was engaged in experiments, activities, model-making to explore various concepts from Biology, Physics, Chemistry, Electronics and Earth Sciences. Activities were designed so as to build understanding as well as to reinforce the concepts, and building real-world connections to simple concepts. Through the workshop activities, it was conveyed that even simple everyday material can be effective in preparing activities to demonstrate Science and Maths concepts.

An orientation to the Teachers TryScience website was given to the participants to enable web based learning. This web resource also hosts resources transadapted in Gujarati by the Centre. This resource was useful to the teachers as it was developed

keeping in mind their requirements. To reinforce the learning from the workshop and support teachers in taking it to their classroom, quality resource material was provided to them. The resource material included a set of carefully selected publications which could be placed in the school's library or the science club.

"In the training, experiments were demonstrated very effectively and the best part was that the participants got the chance to perform the experiments themselves. Such training should be of longer duration instead of two days, giving ample time to learn new things. The TTS website is a good opportunity for the teachers to showcase their activities conducted in their classroom."

- Patel Minaliben, Teacher
Pipaldahad Primary School, Dist. Dang

VASCSC also tried to make TTS resource more user friendly for the teachers from the govt. schools of Gujarat, where Gujarati is used. Based on previous years' feedback, the task of transadapting 30 more syllabus-based relevant activities of TTS in Gujarati, was undertaken so that the trained teachers could use them and also share with their peers. The lesson plans for the TTS activities were developed and new activities that are extensions of the existing ones were also prepared by the resource persons of VASCSC in Gujarati and were uploaded on the TTS website.

16 workshops were planned to be conducted during the period Sep 2016 - Apr 2017 in 16 different districts of Gujarat. 804 teachers participated in these workshops, as given in the following table:

Sr. No.	District	Workshop Date	Participants
1	Patan	6 - 7 Sep 16	51
2	Banaskantha	8 - 9 Sep 16	48
3	Surendranagar	20 - 21 Sep 16	44
4	Mehsana	4 - 5 Oct 16	50
5	Junagadh	18 - 19 Oct 16	48
6	Rajkot	20 - 21 Oct 16	45
7	Dang, Ahwa	22 - 23 Nov 16	55
8	Surat	24 - 25 Nov 16	53
9	Bharuch	8 - 9 Dec 16	56
10	Bhavnagar	29 - 30 Dec 16	49
11	Panchmahal	24 - 25 Jan 17	57
12	Amreli	8 - 9 Feb 17	55
13	Dahod	20 - 21 Feb 17	56
14	Bhuj	16 - 17 Mar 17	45
15	Sabarkantha	21 - 22 Mar 17	36
16	Kheda	6 - 7 Apr 17	56
Total no. of teachers trained across Gujarat			**804**

"In the training we made our own individual models which helped in increasing our understanding and can be easily replicated for the students. The information uploaded on TTS website regarding the models is highly informative and very interesting."

- Patel Chiragkumar, Teacher
Nadasa Primary School, Mehsana

Session for Teachers from US

A group of 15 scholars of Fulbright-Hays Seminars Abroad Program visited the Centre on 20 July 2016 to learn more about the innovative ways through which Science is promoted among students by VASCSC. The group consisted of US high school teachers, who were excited to learn about and experience various activities of the Centre.

Training Programme at Kutch

VASCSC team conducted two teachers training workshops, with support from American India Foundation Trust. The aim of the workshops was to introduce the participants to hands-on approaches in teaching of Science and Mathematics and also to strengthen their understanding of these subjects. This was a slightly intensive effort to build the capacity of the young educators teaching students of Std. 6-8 from rural areas.

• The first training workshop on 'Hands-on Approaches in Science & Mathematics Education' was conducted during 1 - 3 Dec 2016 at Lakadia, Kutch. The workshop focused on model-making to understand Science & Mathematics concepts better. The workshop involved discussion and addressing difficult concepts for the participants. 32 teachers who are working in villages of Kutch, participated in the workshop.

• The second training workshop on 'Hands-on Approaches in Science and Mathematics Education' was conducted during 8 - 10 Mar 2017 at VASCSC for educators from AIF's Learning Resource Centres. The workshop consisted of hands-on sessions including model-making, experiments, night-sky watching, model rocketry, etc. The group was oriented on how to enhance the Resource Centre facility and use it effectively with the target group. Several difficulties faced by the participants while conducting the Resource Centre's activities were addressed as well as many complex concepts were clarified for them. 21 participants from Kutch, Surendranagar, Bhavnagar, Amreli, Sabarkantha and Morbi participated.

Training Workshops at Jammu

• VASCSC conducted a four-day training workshop on 'Hands-on Approaches in Mathematics Education' for Master Resource Persons at SIE, Jammu during 6-9 Mar 2017. 38 master resource persons from various districts of J&K participated. The workshop was organized as part of RAA activity by RMSA, J&K. The workshop methodology included model-making activities, games and puzzles used for effective Maths teaching. A Resource Material set was given as takeaway to participants for further reference.

Since the workshop was for master resource persons, a in-depth understanding of several topics was given like Algebra, Algebraic identities, games and puzzles, Topological puzzles, Magic Squares, Summation, AP, Introduction to Geometry, Triangles, Quadrilaterals, Area, Tessellations, Midpoint theorem, $AD^2=BDxDC$, Pythagoras Theorem, Trigonometry, Heights and Distances, Probability, Circles, Solid Shapes, Net of a solid, Polyhedra and Euler's Formula, Surface Area, Volume, etc.

• VASCSC conducted training workshop on 'Hands-on Approaches in Science Education' focusing on Biology, for Master Resource Persons at SIE, Jammu during 15-18 Mar 2017, conducted as part of RAA activity by RMSA, J&K. 38 master resource persons from J&K participated. The workshop included experiments, model-making and activities which could be easily replicated in classrooms for better understanding of concepts. Resource Material was given to participants at conclusion of workshop.

Several topics of Biology in which teachers faced difficulty while teaching were transacted through hands-on methodology which the end users i.e. teachers from J&K state, could conduct in their classroom with ease. Topics included Testing of components in food, Human Body Systems, Chromatography, Antacid Analysis, Microscopy, Enzymes, Ecological Concepts, Acid, Base & Salt, Designing an Experiment, DNA Extraction, Model Making, Plant pigment, Food adulteration testing, Osmosis, Genetics, Greenhouse Effect, etc.

Innovation in Science Education

With support from Oracle, 6 teachers training workshops were conducted during 2016-17. The teachers had choice of participation based on their level (std. 6-8 or std. 8-10) and subject interest. These workshops titled 'Innovative Approaches in Science and Mathematics Education' received 301 participants from different parts of the country.

XII Publications and Learning Aids

The Centre brings out publications and learning aids to provide the end users with authentic, engaging and relevant material. This material is developed with the idea of providing quality material to students and teachers, which can be used by them for Science teaching and learning. The primary languages used are English and Gujarati. However, efforts are being made to develop and transadapt content into Hindi, to widen the reach to more groups across the country. Several books and user manuals for TLM are also prepared in Gujarati and Hindi, keeping in mind the insufficiency of Science based material in the local language.

In 2016-17, several existing publications were reprinted in large numbers as a result of their increasing demand. The following new publications and learning aids were brought out by the Centre:

Science Wall Planner 2017

The Science Wall Planner is a unique theme-based publication of the Centre. Besides a planner, it contains useful scientific information. The Centre has been bringing out this product consistently since 2005 and has been well-appreciated. The users of the planner comprising teachers, students & individuals, have found it useful for planning events, talks, activities, etc. based on information provided therein.

The year 2017 was declared as the 'International Year of Sustainable Tourism for Development' by the United Nations. VASCSC Wall Planner 2017 was designed and developed based on this theme, in English. The aim was to create awareness among students and teachers about role of sustainable tourism in minimizing negative and maximizing the positive effects of tourism on environment, local communities and heritage. The Planner also contained information about national and international days that are observed to mark important scientific events, birth anniversaries of eminent scientists and astronomical events. The Wall Planners were made available at Science Shop, sent to various institutions and included as a takeaway material in various programmes of the Centre.

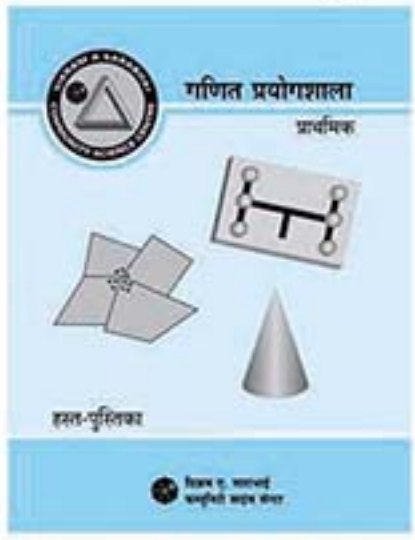
Vigyan Drashti

The Vigyan Drashti is a Gujarati bimonthly wall-magazine. It is published in a four-colour poster format, printed on both sides. One side of each volume contains articles, activities, experiments, latest developments, puzzles and amazing facts related to Science and Mathematics. The other side has a poster. This wall magazine caters to age group of 10 years and above. A large number of teachers, students and schools subscribe it to learn more about scientific information, facts and development. It serves as an effective science learning resource in local language. Six volumes were brought out during 2016-17. These volumes carried posters on theme of Electric Circuits and Connections, International Year of Pulses, India's Space Programme, Human Blood, Nobel Prize 2016, Water Cycle and Carbon Cycle in addition to articles on the other side.

Hindi Manual for Maths Lab Secondary Package

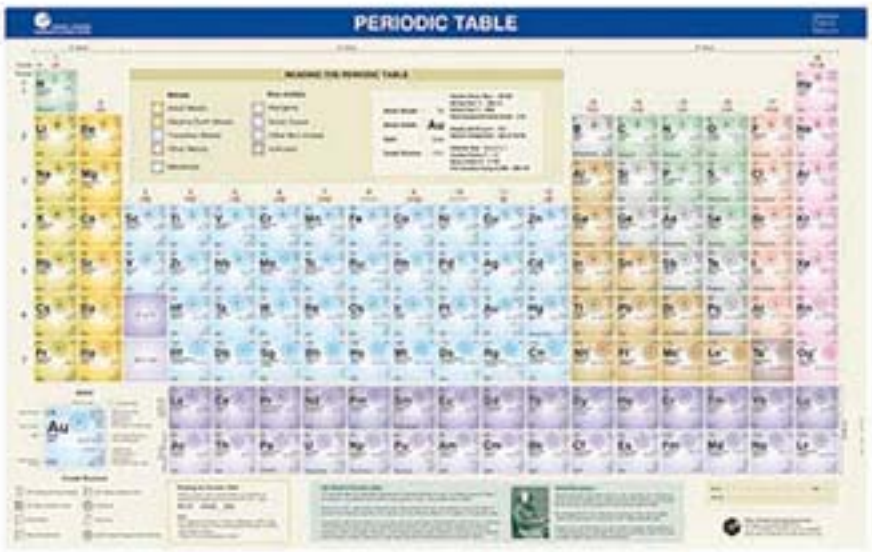
Maths Lab Secondary Package was introduced by VASCSC in 2010. It contains select models for setting up Maths Lab at secondary school level. The package contains models comprising teaching aids and puzzles as well as a user manual. This package is made available through the Science Shop. The Package has received a good response from schools across the country. The user manuals provided in the

Maths Lab package were earlier available in English and Gujarati only. This year the User Manual was developed in Hindi to cater to the growing demand from Hindi users. The manual provides detailed description of the models provided in the package and how to use them to effectively teach and learn Mathematics concepts.



Periodic Table - Updated

The Periodic Table is a Chemistry resource which is a necessity for students and Science teachers from std. 8 & above. VASCSC brought out the Periodic Table several years back in poster format which could be used by multiple groups including the students for individual use or teachers for use in school, Science/Chemistry laboratory or library. The Periodic Table was updated in 2016. Hence, VASCSC brought out a new updated Periodic table in an attractive four-colour design format with some basic information about its creator - Dmitry Mendeleev also. This Periodic Table poster includes the latest updates as per IUPAC recommendation in 2016, with name and symbols for 4 elements: Nihonium (Nh), Moscovium (Mc), Tennessine (Ts) & Oganesson (Og) respectively for element 113, 115, 117 and 118.



Balancing Nails Puzzle

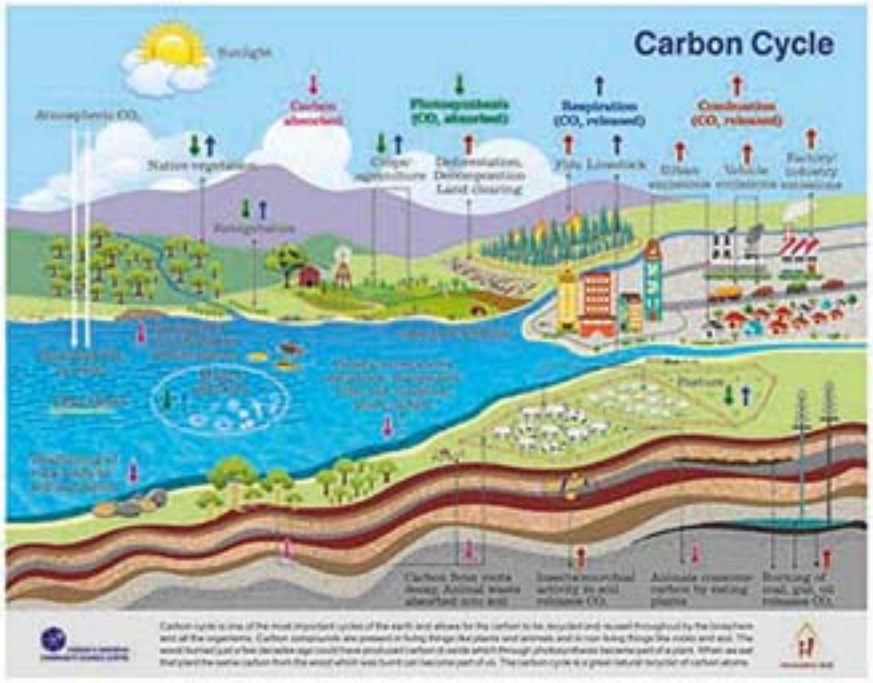
A Balancing Nails puzzle was created for use in the Quadrangle. The puzzle is based on the principle of centre of gravity. The puzzle consists of a nail fixed vertically in the centre of a base as well as six loose nails. The puzzle requires the users to balance the six nails on the fixed nail's head. This task requires concentration and skill, but at the same time it is enjoyable.

Science Behind Miracles - Panel & Booklet

A miracle apparently contradicts scientific laws and hence, is thought to be due to supernatural causes. Many individuals take advantage of the gullible public by performing such 'miracles' as well as spread superstitions. Keeping this in mind, some products were developed on the theme of 'Science behind miracles'. The aim was to explain the Science behind the so-called miracles and instill rational thinking amongst the masses. Firstly, content highlighting several beliefs, superstitions, etc. was developed and displayed in the Centre's Quadrangle space in large backlit Panel format. A booklet was also developed on the theme in English, Hindi and Gujarati. This booklet was widely distributed across India through the Science Express.

Panels and Charts

Charts and panels were developed to provide understanding of various Biogeochemical cycles. The content of these was developed in English and Gujarati and displayed in Centre's Quadrangle space. Also, large size panels based on Skeletal System, Solar System and Optical Illusions were developed for display at the Centre.



XIII Networking and Partnerships

VASCSC is thankful to the following agencies who have been our major funding and project partners for the year 2016-17:

- Department of Science & Technology (DST), National Council on Science & Technology Communication (NCSTC), Govt. of India, New Delhi
- Department of Biotechnology (DBT), Govt. of India, New Delhi
- National Council of Science Museums (NCSM), Govt. of India, Kolkata
- Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi
- Oracle
- Charities Aid Foundation India
- IBM India
- KHS Machinery, Ahmedabad
- Dr. Sureshbhai D. Bhatt Charitable Trust

VASCSC has been collaborating and networking with several institutions and organizations. The list of some of the collaborating institutions during 2016-17 is as follows:

- Ahmedabad Education Society
- Ahmedabad Municipal Corporation
- All India Radio
- American India Foundation
- Arunodaya Sarvajanik Vidyalaya, Ta. Kaprada
- Ashramshala, Lavkar, Ta. Kaprada
- Centre for Environment Education (CEE)
- DIETs, Gujarat
- Gujarat Council of Educational Research & Training (GCERT)
- Gujarat Council of Science & Technology (GUJCOST)
- Gujarat Ganit Mandal
- Gujarat Science Academy (GSA)
- Indian Army, Ahmedabad Cantt.
- Indian Association of Physics Teachers (IAPT)
- Indian Railways
- IITRAM, Ahmedabad
- M. D. Sarvajanik High School, Ta. Kaprada
- Nehru Foundation for Development
- RMSA, Jammu & Kashmir
- Shri Navsarjan High School, Ta. Kaprada
- Shri Vrindavan Ashram Shala, Ta. Kaprada
- St. Xavier's College, Ahmedabad
- US Fulbright-Hays Programme
- Vigyan Prasar, New Delhi

Our Bankers

- Bank of India
- HDFC Bank
- ICICI Bank
- State Bank of India

Board of Governors

Members of the Board of Governors of the Vikram A Sarabhai Community Science Centre (Society), Ahmedabad
(As on 31 March 2017)

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One Tower Lane
Suite 1825, Oakbrook Terrace
IL 60181, USA

Members
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National Institute of Design
Bhagtacharya Road
Paldi, Ahmedabad 380 007

Shri Bimal Patel
President
CEPT University,
Kasturbhai Lalbhai Campus, University Road
Navrangpura, Ahmedabad 380 009

Dr. Abhijit Sen
Institute of Plasma Research (IPR)
Near Indira Bridge
Bhat, Gandhinagar 382 428

Ms. Meenalochani Raghunathan
Director - CSW
GMR Varalakshmi Foundation
Villa No. 34, Prestige Oasis
Addevishwanathapura Rajankunte
Off. Dobbaballapur Road
Bangalore 560 064

Shri B.S. Bhatia
Project Director
Gandhi Heritage Portal
Gandhi Ashram
Ashram Road, Ahmedabad

Ms. Minakshi Balkrishna
Head of Primary Section
Ahmedabad International School,
Opp. Rajpath Row House, B/h Kiran Motors
Bodakdev, Ahmedabad 380 054

Shri Chander Mohan
Head, SEED & KIRAN Division
Department of Science and Technology, GoI
Technology Bhavan, Room 8, Hall A
New Mehrauli Road, New Delhi 110 016

Dr. Anamik Shah
Vice Chancellor, Gujarat Vidyapith
Ashram Road, Ahmedabad &
Professor
Department of Chemistry
Saurashtra University, Rajkot

Ms. Pallavi Patel
Director
CHETNA
SUPATH-II, B-Block, 3rd Floor
Opp. Vadaj Bus Terminus
Ashram Road, Ahmedabad 380 013

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Nehru Foundation for Development
Thaltej Tekra, Ahmedabad 380 054

Shri T. K. Balappan
Secretary
Nehru Foundation for Development
Thaltej Tekra, Ahmedabad 380 054

Member Secretary
Shri Dilip Surkar
Executive Director
Vikram A Sarabhai Community Science Centre
Navrangpura, Ahmedabad 380 009

Financial Highlights

Abridged Balance Sheet

(Rupees in Lakh)

Funds and Liabilities	31.03.2016	31.03.2017
Reserves and Surplus	188	217
Project Grant Balances	187	220
Suppliers and Sundry Creditors	50	103
Total	**425**	**539**

Assets	31.03.2016	31.03.2017
Movable Properties	72	74
Investment	255	384
Cash and Bank accounts	74	44
Income Receivable	11	11
Advances and others	10	25
Stock of Edu. & Training Material	3	2
Total	**425**	**539**

Abridged Income and Expenditure Account

Income	31.03.2016	in %	31.03.2017	in %
Project Grants (Revenue Recognition)	336	53	415	58
Transfer from Earmarked Funds	9	1	4	1
Revenue from Publication and other Educational Materials	26	4	36	5
Fees for Educational Programmes	75	12	84	12
Recoveries and Interest	193	30	181	25
Total	**639**	**100**	**720**	**100**

Expenditure				
Staff Salaries	181	28	187	26
Projects and Programmes	382	60	467	64
Establishment and Administration	56	9	33	5
Against Earmarked Funds Expenses	6	1	4	1
Total Recuring Expenditure	**625**	**98**	**691**	**96**
Non-Recuring Expenditure	**2**	**0**	2	1
Total Expenditure (Recuring+Non Recuring)	**627**	**98**	**693**	**97**
Reserves and Surplus	**12**	2	27	3
Total	**639**	**100**	**720**	**100**

Funding Sources for Expenses

Details	31.03.2016	in %	31.03.2017	in %
International Sources	16	2	89	12
National Sources	320	50	326	45
Interest & Donation	10	2	19	3
Education Programmes	101	16	84	12
Self Generated Sources	192	30	202	28
Total	**639**	**100**	**720**	**100**

Note

- Recoveries and interest include user charges, overheads, other miscellaneous income and interest.
- Project Grant income shows revenue recognition.
- Income from earmarked funds have been transferred from the specific fund created for the said purpose.
- The figures are taken from the audited statement of accounts of the respective years.

VASCSC is registered under the Societies Registration Act 1860, Reg. No. GUJ/2425 (Ahmedabad) and registered under the Foreign Contribution (Regulations) Act 1976 with the Ministry of Home Affairs, Govt. of India, New Delhi. (Registration No. 041910288, 29 Nov 2002). Donations to Vikram A Sarabhai Community Science Centre are exempted U/S 80G (5) of the Income Tax Act 1956.

Science fair sees 4K people on Day 2

Working models of helicopters, operational drones, magnetic shoe laces & more at the fair on Wednesday

DNA Correspondent @dnaahmedabad

Ahmedabad: Vikram A Sarabhai Community Science Center (VASCSC) is brimming with people as it saw over 4,000 attendees on second day of

"It took me six months to make a fully functional drone. I have also made a digital log and magnetic shoelaces. I'm very happy to see so many people visit and ask me how all these work. I have no friends

Participants work on their science projects at the event

-Hanif Sidi/DNA

at the terrace of VASCSC saw children spot celestial objects with the help of telescope. Many parents could not contain their excitement and ensured their turn at the telescope.

"This fair is a platform for all to come up with innovative ideas, processes and products for improving the quali science and mathematics ativity and innovation go in hand. The activities b fair gave ample opportur

to the participants to explore various facets of science."

ઈનોવેશન ફેરમાં વિદ્યાર્થીઓએ જાણ્યુ ચમત્કારો પાછળનું સાયન્સ

બાળકોએ લાઈવ ડેમોસ્ટ્રેશન દ્વારા પોતાની અંધશ્રદ્ધા દૂર કરી

હિતી રિપોર્ટર @ahm_cb

અંતિમ દિવસે આ પ્રયોગોએ આકર્ષણ જમાવ્યું

એન્ટિ આલ્કોહોલ કાર

Golden jubilee of Sarabhai's scientific tempering of India

Nobel laureate C V Raman and Vikram Sarabhai at the CSC's foundation-stone laying ceremony in Ahmedabad

Community Science Centre Ushered In New Era Of Education

TIMES NEWS NETWORK

Ahmedabad: In 1963, Vikram Sarabhai, then already an established scientist and pioneer, engaged scientists at Physical Research Laboratory (PRL), Navrangpura, in a project to take science to citizens that was identified as an 'Experiment for Improvement of Science Education'.

Three years later, the same initiative took on a more formal avatar as India's first community science centre (CSC), opposite the PRL campus. The CSC's foundation stone was laid by Nobel laureate C V Raman.

On June 1, the science fraternity celebrated the golden jubilee of Vikram A Sarabhai Community Science Centre (VASCSC) at the campus, by remembering the early days of science education in India and the centre's role as an award-winning organization that is the backbone of the successful Science Express initiative.

Dilip Surkar, director of VASCSC, told TOI that in 1972 PM Indira Gandhi gave the centre its name after the demise of Dr Sarabhai.

"The centre not only inspired other organizations across the country but also started innovative programmes such as a science circus, science for housewives and the production of low-cost educational tools. One of the most famous early tools was a functional microscope available for just Rs 9," he said.

Officials said VASCSC provided a template for similar centres — interactive exhibition space, open laboratories, mathematics laboratory and science playground. It was also the first to develop computer-based animated educational programmes. In the late '90s, VASCSC is open to all.

Science Express, which has been operating since 2007, has a number of national and international awards to its name. VASCSC has also got the National Award for Outstanding Efforts in Science and Technology Communication in 2008 and 'The Times of India Social Impact Award' for Education in 2001.

Media Coverage

teachers learn how to ngthen STEM subject

Rishmita Aich

he latest two-day workshop for te- Vikram A Sarabhai Community (VASCSC) concluded on July 15, , the organization has been provi- training in innovative do-it-your- ts to make STEM subjects (Scien- Engineering, Mathematics) mo- rous teachers how to involve stu- ties like model making, using tres, and other learning activi-ti-

e DIY projects included a magne- ade using cardboard, paper cut- rse, a magnet – an atom model ool, and building blocks for tea- among other ideas. The works- said they intend to conduct 40 reaching out to 2,000 plus tea-

The project shows teachers how to involve stu- in activities like model making and using web- resources

"It," said Nidhi Sikotra, a scien- dthal primary school. Sikotr respiratory model out of d- tles and balloons at the work- ans also published books an- ching kits on several methods of interacti-

VASCSC... "we could've sent out training experts

સેન્ટર ફોર એન્વાયર્મેન્ટ એજ્યુકેશનના કાર્તિકેય સારાભાઈએ

સ્ટુડન્ટ્સ માત્ર ક્લાસરૂમ સ્ટડીને જ ન પ્રેક્ટિકલને પણ મહત્વ આપે તે જરૂ

વિક્રમ સારાભાઈ કોમ્યુ.સાયન્સ સેન્ટર ખાતે ત્રણ દિવસના ઈનોવેશન ફેરનં

હિતી રિપોર્ટર @ahm_cb

૨૪ ફેબ્રુઆરીને નેશનલ સાયન્સ ડે નિમિત્તે શહેરના વિક્રમ સારાભાઈ કોમ્યુનિટી સાયન્સ સેન્ટર ખાતે ત્રણ દિવસ ચાલનારા ઈનોવેશન ફેરની શરૂઆત થઈ છે. જેનો એન્વાયર્મેન્ટ એજ્યુકેશ (સીઈઈ) ના કાર્તિકેય સારાભાઈએ કર્યું કે, 'દુનિયામાં આજે ઈનોવેશનને લઈને દરરોજ નવા અપડેટ્સ આવતાં રહે છે. આ સ્થિતીમાં આપણે નવી પેઢીને સાયન્સમાં લેતી કરતી કરીએ અને રિસર્ચ ઓરિએન્ટેડ બનાવીએ તે મહત્વનું છે. આજના ટેકનોલોજીકલ યુગમાં સ્કુલ અને કોલેજના સ્ટુડન્ટ્સ માત્ર ક્લાસરૂમ સ્ટડીને જ નહીં પણ સાથે સાથે પ્રેક્ટિકલને પણ મહત્વ આપે તે ખૂબ જરૂરી છે.'

ફેરમાં 200 સ્કૂલના 2 હજાર સ્ટુડન્ટ્સ સાયન્સ સાથે કનેક

મંગળ ઉપર જીવનની શોધ અને રિસર્ચ માટે માર્સ સેવર તૈયાર કર્યું

ધો.૭ અને ૧૧ના વિદ્યાર્થીના પરમાર અને પરેશ મારવાડીએ મંગળ ઉપર જીવનની શોધ અને તેના પર વધુ રિસર્ચ માટેનું આ માર્સ સેવર મોડેલ તૈયાર કર્યું છે. સ્ટીક, મોટર અને બોલનો ઉપયોગ કરીને તેમણે આબેહૂબ મોડેલનો નમૂનો ઈનોવેશન ફેરમાં મૂક્યો છે.

પોર્ટેબલ સોલાર ફ એન્ડ હિટર

સંતકબીર સ્કૂલના ધો. દેસાઈએ આ ફેરમાં ગ અને ઠંડીમાં ગરમી આ સોલાર યુએસબી ફુલ મોડેલ તૈયાર કર્યું છે.

Science Express eyes multiple world records

Parth.Shastri@timesgroup.com

Ahmedabad: The Science Express: Climate Action Special (SECAS), is set to break a number of world records by the end of its current, its ninth, run. Officials at city-based Vikram A Sarabhai Community Science Centre (VASCSC) have started on the paperwork to claim the records.

The Science Express (SE) has got six records to its name in the 2017 edition of Limca Book of Records, in most SE has bettered its own records. An initiative started in October 2007, the mobile exhibition has completed eight phases, which includes four phases of 'Science Express', three of the 'Biodiversity Special' (SEBS) and one 'Climate Action Special' (SECAS) phase.

Dilip Surkar, director of VASCSC, the institution that manages the train, said that with the current run, they hope to break a number of world records. "Thanks to the national records, we have good documentation of the achievements and want to carry this forward. The record book has already recognized it as the longest running mobile science exhibition," he said.

THE RECORDS

- **Largest climate change awareness programme** | SECAS during its 19,800km run between October 2015 and May 2016 has covered 64 locations in 20 states and directly reached 20 lakh visitors
- **Most expensive train ticket** | For the run, Indian Railways issued its most expensive ticket to date, worth Rs 12,64,37,164, in the name of Dr A B P Mishra, scientist, DS&T, on October 13, 2015
- **Longest running mobile science exhibition** | Science Express was launched on October 30, 2007. It has travelled 1,37,115km in its eight runs as on March 22, 2016. This is listed as a world record
- **Most visited mobile science exhibition** | The train halted at 442 stations in 1,554 exhibition days. During this period, it drew 1.52 crore visitors
- **Most students performing experiments** | At the on-board "Joy of Science" lab in one coach of the train, 4,01,227 students have performed experiments in science, mathematics and environment science
- **Most visitors to a science exhibition in a day** | When SECAS halted at Anajmandi railway station near Rewari in Haryana on December 11, 2015, it got 63,996 visitors

Kids learn from science experiments at VASCSC

Ahmedabad: The three-day Innovation Fair at Vikram A Sarabhai Community Science Centre (VASCSC) concluded with demonstrations of science experiments and hands-on workshops.

Officials of Sarabhai centre said that in the past three days, there were over 7,000 visitors from various city schools. They participated in various activities and also visited the exhibition.

"On the last day, models prepared by students for various events and competitions were exhibited throughout the fair," an official said.

"Several popular activities from the previous two days were held on the last day. Participants learnt much at do-it-yourself workshops. The competition for innovative ideas in STEM education saw some great entries by teachers and educators."

Dilip Surkar, director, VASCSC, said

LEARNING WITH FUN

that aim of the Innovation Fair act was to develop the spirit of inquir curiosity in children. This will help to grow into 'innovators' for life, S said. Mahesh Thakkar, a teacher Thaltej primary school, said that it platform for students to interact an re their creations with scientists.

CLIMATE CHANGE AWARENESS GETS ON TRACK

With 16 coaches, the Science Express will cover a total of 19,000 km across India

EXHIBITION ON THE MOVE

With every passing year it has become increasingly clear that there is an urgent need to address the challenges posed by climate change in the world. And one of the main ways to do so is by educating the public of its implications and urging them to make better choices for themselves and the planet. To do just that, the government of India has flagged off a 'Science Express' that will spend seven months traveling across the country and raising awareness.

A collaborative effort by the ministries of Railways, Environment and Science and Technology, the Science Express Climate Action Special has already begun its journey and will end it on September 8, 2017. Anyone who will be attending the exhibition will be able to gauge how they can make conscious lifestyle

tion for kids where they will be taught how they too can go 'green' in school and at home.

A science exhibition on the move, this isn't the first journey by the Science Express. It was originally flagged off in 2007 and has embarked on similar journeys eight times since. The train, which has been custom-built by the Indian railways specifically for the depart-

Nomograms, songs make maths, s

Sanand Teacher Goes Innovative To Engage Kids

TIMES NEWS NETWORK

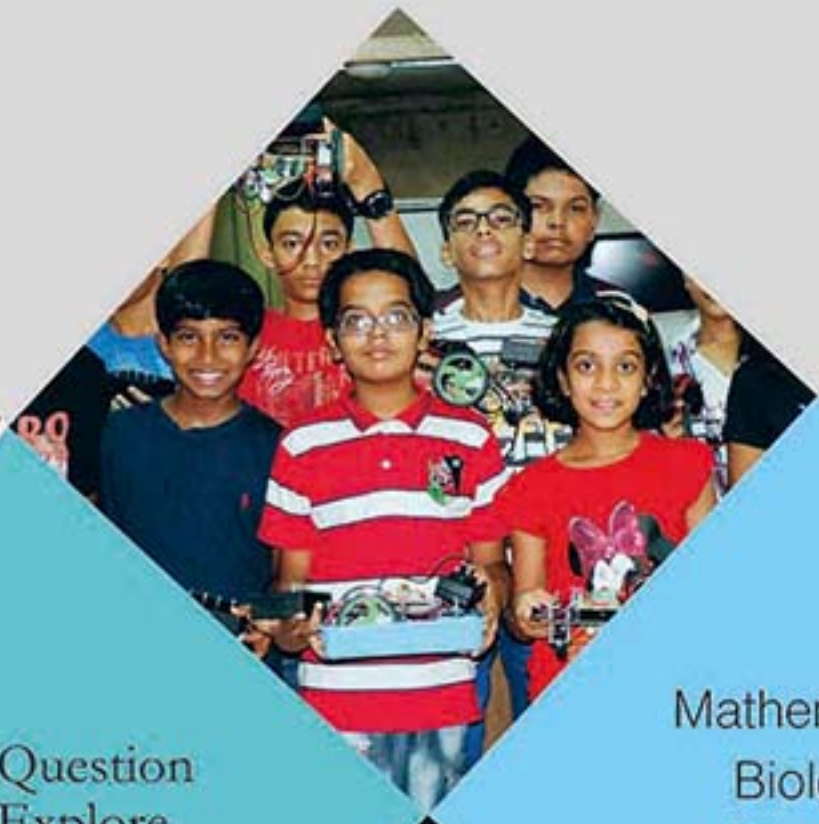
Ahmedabad: What if you can hum a tune to remember the qualities of acids and bases, or use a board with nails to do multiplication?

These are the tools used by students of secondary standards-classes VI, VII and VIII-of Chacharwadi Vasna Aadarsh Prathmik Shala near Sanand, as teacher Bansi Lakhtariya, 32, has got them hooked to mathematics and science.

"These were the main subjects where we recorded lower marks.

Bansi Lakhtariya

in the languages or history. I then attended workshops by Vikram A Sarabhai Community Science Centre (VASCSC) and other organizations to learn new pedagogies. I decided to devise my own tools," says Lakhtariya, who has been teaching for seven ye-



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VIKRAM A SARABHAI
COMMUNITY SCIENCE CENTRE

Navrangpura, Ahmedabad 380009
T: +91-79-26302914, 26302085, 26306160
F: +91-79-26306497 E: info@vascsc.org

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