



Dr. Vikram Sarabhai
Centenary Celebrations



The Joy of Science

Annual Report
2019 - 20



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COMMUNITY SCIENCE CENTRE

૬૮% સુધીના સૂર્યગ્રહણના 'રિંગ ઓફ ફાયર' જોવા મળ્યો

ગુજરાતમાં અઢી કલાકથી વધુ કંકણાકૃતિ સૂર્યગ્રહણનો અલૌકિક નજારો જોવા મળ્યો

અમદાવાદ, ગુરુવાર : સૂર્યગ્રહણને ટેલિસ્કોપ તેમજ વિશિષ્ટ ચરમા દ્વારા સૂર્યગ્રહણ જોવા માટેની વ્યવસ્થા કરવામાં આવી હતી. ર.૩૦ કલાકથી વધુ ચાલેલું આ સૂર્યગ્રહણ ગુજરાતમાં લગભગ ૬૮ ટકા સુધી જોવા મળ્યું હતું.

ગુજરાતભરમાં ટેલિસ્કોપ-વિશિષ્ટ ચરમાથી સૂર્યગ્રહણ નિહાળવા માટે વ્યવસ્થા કરાઈ : મંદિરોના દ્વાર બપોરથી ખોલાયા

ગુજરાતમાં સવારે અંદાજે ૮:૦૦થી સૂર્યગ્રહણનો પ્રારંભ થવા લાગ્યો હતો. સૂર્યગ્રહણ થતું ત્યાં સુધી તડકો પણ ઓમો થઈ ગયો હતો. આંશિક સૂર્યગ્રહણ નિમિત્તે રિપાઈરમાં હોય તેવા સાધન એન્ડ ટેનોલોજીએ સાધન અને ગુજરાતના સહયોગથી વિશિષ્ટ ટેલિસ્કોપ આપોજન કર્યું હતું.

૩ હજારથી વધુ વિદ્યાર્થીઓ, વિજ્ઞાન રસિકોઓ, અને કુટુંબકાંતોએ આ અદ્ભુત ઘટનાના સાક્ષી બન્યા હતા. આ વર્ષે ૨૦૧૯ની છેલ્લી મોટી અવકાશી ઘટના હતી. જ્યારે ચંદ્ર સૂર્યના કેન્દ્રની અને પૃથ્વીની વચ્ચે આવે છે ત્યારે માત્ર સૂર્યની ડિસ્કની જ દેખાય છે અને તેનાથી 'રિંગ ઓફ ફાયર' બની શકે છે, જેને આંશિક સૂર્યગ્રહણ કહેવામાં આવે છે. સંપૂર્ણ રિંગ ઓફ ફાયર ઉઠી, મેંજલોર, ક્રોમોસ્ફીયર, કોરોના, તિરંગાપટ્ટી એમ દશિક ભારતમાં સંપૂર્ણ રિંગ ઓફ ફાયર નજારો માણ્યો હતો. જેમાં ૧૦ ટેલિસ્કોપ અને બોક્સ કેમેરાની વ્યવસ્થા ગોઠવાઈ હતી.

સૂર્યગ્રહણને લીધે જ્યોતિર્લિંગ પર પણ અસર થઈ હતી. મુખ્યત્વે જોશીમાં આ ગ્રહણ ઘવાનું હોય તે જ રાશિ દેશના રાજા કે પ્રધાનમંત્રી કે રાષ્ટ્રપતિની હોય તો તે દેશમાં વિશેષરૂપે આપતિઓ આવે છે. જ્યોતિર્લિંગોના મતે આ સૂર્યગ્રહણ પત્ર રાશિ કે મૂળ નક્ષત્રના ત્રીજા ચરણમાં ઘવાનું હોવાથી ભારત માટે અશુભ નથી. કેમકે, વડાપ્રધાન નરેન્દ્ર મોદીની જન્મ રાશિ વૃષિક હોવાથી તેમના માટે પણ અશુભ નથી. પરંતુ ગ્રહણ સમયે આકાશમાં પત્ર રાશિમાં દે ગ્રહ હોવા કે સૂર્ય-ચંદ્ર-શનિ-બુધ-ગુરુ-કેતુ જેવા ગ્રહોથી અશુભ યોગ રચાય છે તે દેશ-દેશના માટે આપતિરૂપ ગણી શકાય. કેમકે, આ સમય દરમિયાન ૪૦ કિલ્લમાં ભૂકંપ, ૨૦૦૦થી વધુ સીસીડી સર્જાયાં હતાં.



હળવદ ભાસ્કર : હળવદના શક્તિનગર ખાતે આવેલા કલ્ક ગુરુકુળ પામે મોડેલ રોકેટરી વર્કશોપનું આયોજન કર્યું હતું. ૨ દિવસીય આ વર્કશોપમાં અમદાવાદની વિક્રમ સારાભાઈ કમ્યુનિટી સેન્ટર ટીમના તજજ્ઞો દ્વારા વિદ્યાર્થીઓને બગોળ વિજ્ઞાનના પાસાઓ, મહાહતી પ્રસારણ અંગે સમજૂતી આપી હતી. આ આયોજન માટે મહંત દલસુખરામ બાપુ, કુશાભેન પ્રજાપતિ તથા વિક્રમસારાભાઈ ઇનસ્ટિટ્યુટ ટીમે પ્રયાસ કર્યા હતા.



સિટી સિપોર્ટર : જામતપુરા સ્થિત એસઆરપેન ઇન્ટરનેશનલ સ્કૂલ મેં નીતિ આયોગ વે તત્વાવધાન મેં અનર્બાક્સ ટિકરિંગ વર્કશોપ મેં ચાર દિવસીય ટીચર્સ ટ્રેનિંગ કા શુભારં ક્રિયા ગયા. સ્કૂલ ચેયમેન રવિ શંકર, પ્રાચાર્ય ડા. રામ, મોહિત આજુજા, હર્ષ મટલ પ્રાચી ઉપાધ્યાય એવં સુધીર રામ મેં ટીપ પ્રજ્વલિત કર વર્કશોપ કા શુભારંભ ક્રિયા કરી. વિભિન્ન સ્કૂલોં કા ઇપીએ લેબ મેં નિયુક્ત ટીચર ઇસ વર્કશોપ કા હિસ્સા બને

વિદ્યાર્થીઓએ સૂર્યગ્રહણ નિહાળ્યું

અમદાવાદમાં ૨૬મી ડિસેમ્બરે સવારે ૮:૦૦થી શરૂ થઈને ૧૦:૬૨ વાગ્યા સુધી આંશિક સૂર્યગ્રહણ જોવા મળ્યું હતું. વિક્રમ સે સારાભાઈ કમ્યુનિટી સાયન્સ સેન્ટર દ્વારા નવ વર્ષથી વધુ ઉંમરના બાળકો માટે ગ્રહણ દરમિયાન એક કારોક્ષમનું આયોજન કરવામાં આવ્યું હતું. આ કારોક્ષમમાં વ્યાખ્યાન, હેલ્ડ્રા યોગ પ્રવૃત્તિ તથા પ્રોબેક્શન પદ્ધતિ અને ગ્રેસ સૉલ ઇલિસ્ટ્રના ઉપરોગથી ટેલિસ્કોપ દ્વારા સિટીસાઇનો સમાવેશ કરવામાં આવ્યો હતો. વિદ્યાર્થીઓએ સૂર્યગ્રહણ નિહાળ્યું હતું. ગ્રહણના પ્રારંભ અને અંતમાં ચન્દ્રની ભ્રમણકક્ષાના મુકાવની કેવી અસર થાય છે એ સમજાયા હતા. લગભગ ૩૦૦ વિદ્યાર્થીઓ અને તેમના વાલીઓએ આ અલૌકિક આકાશી નિહાળવાના કાર્યક્રમમાં ભાગ લીધો હતો.

ઈટીએલચ્યા શિક્ષકાંસાઠી કાર્યશાળેચે આયોજન

નામુર, ૩૦ ઓગસ્ટ : નામુરના નાગીવપુર દેવાળા જાગૃતતા યાત્રાના દેવાળામાં તમેજ શિક્ષકોની ક્ષમા વડાન જાન સમુદ્ધ કાર્યાલયના ઉદ્ઘાટન ૨૦ થી ૩૧ ઓગસ્ટ વા કાર્યાલયની બી. આર. વ. ઇનિશિયલ સ્કૂલ પેઠે અનર્બાક્સ ટિકરિંગ નાગીવ કોલેજ વાર ટિકરિંગ શિક્ષક કાર્યશાળા કાર્યક્રમના અગાઉનું કાર્યક્રમ યોજાયો હતો.

કાર્યશાળા અટલ ટિકરિંગ નીચે શિક્ષકોની રમકીલતા વેળે આજે પ્રમુખ હી કમ્યુનિટી સેન્ટર વિજ્ઞાનકર્તા શિક્ષકોની આયોજિત કાર્યક્રમ અંતર્ગત આજે શિક્ષકોએ પ્રશિક્ષણ લીધું હતું. આજે શિક્ષકોએ પ્રશિક્ષણ લીધું હતું. આજે શિક્ષકોએ પ્રશિક્ષણ લીધું હતું.

મોડલ રોકેટરી એવં ઇસ્ટોનોમી વર્કશોપ

અમદાવાદ : હંદ્રાડ્સ of students, enthusiasts and citizens made a beeline for binoculars, telescopes and pinhole cameras at various venues in the city to witness the year's last solar eclipse. Experts said that the next partial solar eclipse will be in June 2020.

શિક્ષકોં કો વર્તાઈ પઢવને કો નઈ તકનીકી જયપુર : નીતિ આયોગ એવં એસઆરપેન ઇન્ટરનેશનલ સ્કૂલ કો આર એસ ચાર દિવસીય ટીચર્સ ટ્રેનિંગ પ્રોગ્રામ શરૂ કર્યા. ઇસ અનર્બાક્સ ટિકરિંગ કાર્યક્રમમાં વિક્રમ-સારાભાઈ સમુદાય સેન્ટર કા પ્રશિક્ષણ દે રહે છે. ઇસ વર્કશોપ મેં શિક્ષકોં કો ઇસ તરફ સે પ્રશિક્ષિત ક્રિયા રા રા છે. ફિ કે વિજ્ઞાનકર્તા કો પાર્કિંગપ્લેન કો સમજા સ્કેપ એવં યોગીનિયમ ક્રમના કા વિકાસ કર સમે. કાર્યક્રમમાં મેં ધૃવી ડિજિટ, ઇન્ટરનેટ ઓફ થિંગ્સ, ક્વિઝના સ્પેસટીક્સ કે ટીચરિંગ સમજાવે જા રહે છે. ઇસ કાર્યક્રમ મેં ટીચર્સ કો ની નર્સલ સમય લેવા એવં કો વીર એક-દુસરે સે સમજા કરવે હોં.

students and their parents witnessed the eclipse. We had organized a special session for the students to draw the progress of the shadowed part to under stand motion of the celestial objects causing eclipse. We used special filters for viewing," said Dilip Surkar, director of VASCS.

Other major locations for Amdevadav's eclipse se were Sabarnati Riverfront, SG Road, Paldi and Gujarat University

ગુડુ માધ્યમિક શાળામાં મોડેલ રોકેટરી વર્કશોપ યોજાયો

આજ કલ ટિકરિંગ-વ્યવસ્થા : ભાગ્યદાતા તાલુકાના ગુડુ ગામની સરકારી માધ્યમિક શાળા ખાતે એ ટિકરિંગ મોડેલ રોકેટરી વર્કશોપ આયોજન કરવામાં આવ્યો હતો. આજે શિક્ષકોએ પ્રશિક્ષણ લીધું હતું. આજે શિક્ષકોએ પ્રશિક્ષણ લીધું હતું.

રી સૌપ્રથમ મેથ્સ લેબ

મેથમેટિક્સ લેબમાં આ પ્રયોગો કરી શકાશે

યુટનના નિયમો આધારિત પ્રયોગ : એવિટોના નિયમો આધારિત પ્રયોગો ગુણાલિત ક્રેડિટ પ્રોગ્રામમાં પ્રયોગ : એવિટોના નિયમો આધારિત પ્રયોગો ગુણાલિત ક્રેડિટ પ્રોગ્રામમાં પ્રયોગ : એવિટોના નિયમો આધારિત પ્રયોગો ગુણાલિત ક્રેડિટ પ્રોગ્રામમાં

નીતિ આયોગ કી પહલ : ચૌથી કક્ષા મેં સિખાળે રોબોટિક્સ, ૩-ડી પ્રિન્ટિંગ

અલ્પ દિવસના સમય કે હતા પ્રદર્શન મેં સંબંધિત ટીક મેંની ઈશિયન હોયે હુરો

ચૌથી સે હી વિકાસ મેં સ્ટેટિસ્ટિક્સ : પ્રદર્શન મેં હુરો હુરોન કોલે જે કાર્યક્રમ મેં સંબંધિત ટીક મેંની ઈશિયન હોયે હુરો

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About next gen tech

With technological advancements moving at a faster pace than ever, here is your chance to make your little ones more aware about next generation technological skills with 'GenNEXT workshops'. 'PCB Prototyping' will teach you how to design and make a customised Printed Circuit Board (PCB) using a chemical etching process. Under 'Arduino and Sensors', you will learn about the arduino micro-controller and how to use various sensors and actuators. With 'Internet of Things', you will know how to upload multiple sensor data on cloud and how to monitor the same online. 'Raspberry Pi' will enable you to build your own computer using Raspberry Pi and the Linux operating system. Create 3D Designs and make prototypes with 3D printing. The session on 'Robot Kinematics and Dynamics' will talk about how robot moves and its movements and how to make robot joints and their independently. Choose from these six or join all of them.

PCB Prototyping
WHEN: Nov 10, 2.30pm

Robot Kinematics and dynamics
WHEN: Nov 24, 9.30am

Arduino and sensors
WHEN: Nov 20, 2.30pm

3D Printing
WHEN: Nov 23, 2.30pm

Internet of Things
WHEN: Nov 21, 2.30pm

Raspberry Pi
WHEN: Nov 22, 2.30pm

WHERE: Vikram A Sarabhai Community Science Centre, Navrangpura. ENTRY: By registration. CALL: 9428405407

Training Session Held For ATL Teachers At Choithram School

Choithram School, Manik Bagh organized a training programme for Atal Tinkering Lab (ATL) teachers under the aegis of Atal Innovation Mission and NITI Aayog in collaboration with Vikram A Sarabhai Community Science Centre. It was attended by 50 teachers of various private and government schools. The focus was to spread awareness on the facilities of ATL and latest technology tools. The training programme included a series of discussions and hands-on sessions which allow interactive learning with an exchange of new ideas. The four-day training programme enhanced the competencies of ATL teachers.

વિક્રમ એ સારાભાઈ કમ્યુનિટી સેન્ટર ઓફ આઈવિપીએ કા માસ્ટર ટ્રેન મીટ્રુ

વિક્રમ એ સારાભાઈ કમ્યુનિટી સેન્ટર ઓફ આઈવિપીએ કા માસ્ટર ટ્રેન મીટ્રુ

4-day workshop begins at Gyan Ganga Education

The foremost aim of this workshop is to help and support the

પંચના કેસરી, વ્યવસ્થા

પંચના કેસરી, વ્યવસ્થા

પરિકલ્પના વ વૈજ્ઞાનિક ક્ષમતા વધાને કા લિપ એડવાંસ ટ્રેનિંગ

પરિકલ્પના વ વૈજ્ઞાનિક ક્ષમતા વધાને કા લિપ એડવાંસ ટ્રેનિંગ

સ્ટુડેન્ટ્સ વ ટીચર્સ કો ડી જા તકનીકી કોશલ કી જાનવ

સ્ટુડેન્ટ્સ વ ટીચર્સ કો ડી જા તકનીકી કોશલ કી જાનવ



Dr. Vikram Sarabhai
Centenary Celebrations

The Joy of Science

Innovative Programmes and Material for Science Education



Annual Report
2019 -20



VIKRAM A SARABHAI
COMMUNITY SCIENCE CENTRE

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Chairman's Message



The world is facing an unprecedented challenge in wake of the COVID-19 pandemic, which has adversely affected all aspects of life. The immediate concern being health and economy, major interventions are being made in these areas. However, one sector that also faces long-term effect is education. It is time for organizations like Vikram A Sarabhai Community Science Centre (VASCSC) to rise and make stronger efforts to mitigate the current situation and bring new learning opportunities for students, especially in science. I am happy that the Centre is making efforts in the post-lockdown phase to continue its activities with innovative measures. The key to sustainability of its programmes is that the Centre adapt and strategize its approach in today's context. This will require more online presence, building capacity in education technology and innovation in methodology.

Dr. Vikram Sarabhai's Birth Centenary was celebrated by the various organizations that were established as a consequence of his vision and efforts. This has been an opportunity for the Centre to contribute to the domain of space education at school level. The Centre's initiative of School Space Club to promote space education among children and to encourage them to pursue education and careers in space science, with a vision of country's technological advancement, is noteworthy. With a dedicated Astronomy lab at VASCSC now, the activities will get the much-needed impetus.

STEM learning has become more effective today with integration of developing innovative thinking and use of emerging technologies. This is not only helping students to better understand the STEM concepts, but also their applications. It is good to note that the Centre is making efforts to foster curiosity, enhance problem-solving approach and spark innovation among teachers and students, through several interventions. I am glad that Centre is making efforts to develop as a leading resource agency to promote innovation among students. To scale up the activities and keeping in mind the needs of today, shift towards online mode would be the way forward.

The recently announced National Education Policy (NEP 2020) has placed emphasis on learner-centric approach and experiential learning. The thrust is on moving the education system towards real understanding and learning how to learn; and create holistic individuals equipped with key 21st century skills such as critical thinking, creativity, scientific temper, communication, collaboration, multilingualism, problem solving, digital literacy, etc. Emphasis has been placed upon teaching and learning in a more interactive manner; encouraging questions, and regular integration of fun, creative, collaborative, and exploratory activities in classroom sessions, for students to obtain deeper understanding. In light of this, VASCSC will have a critical role to play in facilitation of nation-wide implementation of the policy recommendations. The Centre has been at the forefront of science education and with its experience, it is crucial that it puts in more intensive efforts to make high-quality science education accessible to all.

The teachers training programme of the Centre has been effective in professional development of teachers, providing opportunity to learn about hands-on methodology in science and mathematics education. This methodology will enable interactive teaching learning process which encourages questioning, exploration and experiential learning. This coupled with the innovative TLM, helps in concrete visualization of abstract concepts and enrich the science learning experience of students.

Programmes catering to underprivileged children and their inclusion in regular activities of the Centre is a wonderful effort to improve their access to quality science education. Education is a great leveler and such initiatives ensure that all students are provided various opportunities to excel in science. The huge participation and popularity programmes like Mobile Science Lab, School Outreach have once again brought to attention the need of such initiatives.

The CSR supported projects that the Centre is implementing have had successful outcomes in terms of reach and participation. The continuity of such CSR collaborations is important for sustaining the Centre's innovative and successful programmes. It is imperative that the outcome of the various programmes be documented, which serves as useful resource in process of replication and scaling up. Also, possibilities of further collaborations should be explored in a way that VASCSC's rich experience can be put to greater use.

I would like to compliment the Director and the team for their perseverance and excellent work. I would like to thank all the Board members, project partners, students, teachers and well-wishers for their consistent support to the Centre. The coming time will bring more challenges; but at the same time it will also present more opportunities for innovative and ground-breaking work in science education. My best wishes to everyone for future endeavours.

A handwritten signature in black ink, consisting of a stylized 'K' followed by a horizontal line and a small flourish.

Dr. K. Kasturirangan
Chairman, Board of Governors, VASCSC

From the Director's Desk



It gives me pleasure to present our Centre's Annual Report for 2019-20. The new and exciting developments that took place during the year have been presented here. Our efforts for popularizing and improving the quality of Science education have been well-received.

Before the COVID-19 lockdown started in March, we were able to complete majority of the projects. However, planning for the new financial year became difficult due to the uncertainty brought in by the pandemic. We are putting in our best efforts to sustain our activities in the post-lockdown phase by adapting to the changed scenario and staying strong in our focus of reaching out to the children, even with limited access. In fact, we have started offering many programmes in online mode. Although it is a challenge to take the joy of hands-on learning to students in this mode, this aspect is not being compromised as the activity material is being sent to them beforehand.

In 2019-20, innovation-centred activities continued with support from several partners. In the ongoing partnership with Oracle, 23000 students and 1300 teachers across Gujarat participated in the innovative science and mathematics education programmes. Space education activities under this project have picked up momentum. The long-standing partnership with IBM has evolved from STEM to Innovation and AI, to cater to needs of changing times. The capacities of teachers and students are now being built simultaneously in four States, and over 475 teachers and 800 students from ATL schools participated in the workshops. In the Innovation Hub, supported by NCSM, Govt. of India, developing emerging technology skills was a focus. To this end, many new programmes were developed to make children adept with programming, microcontrollers, computing, coding, IoT, home automation, 3D printing, PCB prototyping, robotics, app development, animation, etc. The Young Science Innovators fellowship programme, supported by Dr. Sureshbhai D. Bhatt Trust received good response.

Dr. Vikram Sarabhai Centenary Year was celebrated with several activities including School Space Clubs, Model Rocketry workshops, and publications. We are happy that School Space Clubs were promoted across India, with support from ISRO, Oracle and KHS. Each participating school was given resource material and training for setting up the Clubs. Our team conducted seven training workshops of master trainers from ISRO on effective utilization of this resource. This interaction between our young team of science communicators and researchers from ISRO created a wonderful learning experience for both. The publications included the book 'Dr. Vikram Sarabhai - a life in nation building', Science Wall Planner and poster set 'Space Science Gallery'. With support from Systronics, a dedicated Astronomy Lab was built. This has provided a boost to our ongoing space education activities.

Our Teachers Training Programme has evolved from hands-on approaches in STEM learning to include understanding of latest technologies in order to keep the teachers abreast of latest trends. We are happy to inform that VASCSC was a finalist in the HCL Grant 2020 and received project grant for a series of teachers training workshops. The project will enable us to build capacities of govt. schools teachers in different districts of Gujarat and consequently benefit the students from rural areas.

Some unique partnerships have enabled us to reach out to the children across the country, especially those with limited access. This included the Joy of Science Mobile Science Lab, supported by NCSTC, DST, Govt. of India; and VASCSC Science School programme supported by KHS. VASCSC was instrumental in setting up Science Activity Centres in various locations, the prominent being 11 such Centres in rural schools of Barmer district, Rajasthan, with support from Schlumberger. The demand for science education resources like interactive exhibits and TLM from Science Shop has increased substantially from schools and educational agencies across the country.

The annual programmes of Centre catered to thousands of curious children. The year-long School Science Forum (SSF) competed nine years which indicates the importance of hands-on experience in better and long-lasting understanding of concepts. Summer Programme once again provided 'science with fun' opportunity to children during summer vacation. School Visits, and projects and practicals in labs gave chance to optimize the use of Centre's facilities. With support from Vovantis Laboratories, we could enhance the capacity for conducting student activities.

I would like to extend my heartfelt gratitude to Chairman Dr. K. Kasturirangan and all the Board Members for their invaluable support and guidance. I appreciate the efforts of the VASCSC team in carrying out the Centre's programmes and projects with enthusiasm and determination. Most of all I am thankful to all our well-wishers, project partners, teachers and students for being our constant source of encouragement.

Dilip Surkar
Executive Director, VASCSC

Vikram A Sarabhai Community Science Centre (VASCSC) is a pioneering Community Science Centre, founded in 1966 by India's renowned scientist, Dr. Vikram A. Sarabhai 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. It originated as 'Group for Improvement of Science Education (GISE)' in 1963 from Physical Research Laboratory (PRL), Ahmedabad. The Centre was initially named as 'Community Science Centre'. Later it was renamed as 'Vikram A Sarabhai Community Science Centre', to associate its name with the founder, after his demise in 1971.

The Centre's mandate is to promote among students, teachers and public an understanding of fundamental concepts involved in science education; the acquisition of scientific knowledge & insights as far as possible by the process of inquiry through experiment, audio-visual media and other means; the ability to solve problems; to stimulate interest in the principles of science and scientific method among students, by giving them necessary encouragement and exposure; to be concerned with the role of education & ways of improving science education in relation to individual & the community as a whole; and to help make clear the social implications of science & technology.

The core of its 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.

VASCSC has pioneered in several areas including an interactive exhibition space, open laboratories, Mathematics Laboratory, Science Playground, active use of computers in science education and developing interactive educational programmes - most of which are part of mainstream today.

The Centre's focus on spreading the joy of science by reaching out to different segments of the community is well illustrated by its logo. The five arrowheads in the logo represent different groups comprising teachers, students, research workers, administrators and the community. 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 houses well-equipped laboratories in Biology, Chemistry, Physics, Electronics, Model Rocketry, Mathematics & Computer; Innovation Hub; Science Playground; Library; Workshop and Science Shop. The Astronomy activities were being carried out from the Model Rocketry lab earlier. In the current year, a full-fledged Astronomy lab was established to widen the scope and presence of Astronomy activities of the Centre.

The Centre's efforts for improving the quality of science education and popularization have been recognized through several awards which include the following:

- National Award for 'Outstanding Efforts in Science and Technology Communication' given by Dept. of Science & Technology, Govt. of India in 2008
- The 'Times of India Social Impact Award' for Education in 2011.
- VASCSC was finalist in the HCL Grant 2020 for education and received a project grant of Rs. 25 lakhs.



The Annual Programme aims to develop interest and nurture children's curiosity towards science. This programme is based on twin pillars of inquiry and creativity. Science and mathematics concepts are transacted in a simple and engaging manner. The role of science in daily life is also highlighted to understand its relevance. Science concepts are explained using effective methodologies like demonstrations, experiments, projects, science shows, hands-on activities, etc. The programme orients school children towards science. The following activities were conducted under the Annual Programme in 2019-20:

Open House

Under the Open House programme, visitor groups can explore Centre's facilities and gain joyful exposure to different aspects of science. The facilities include Innovation Hub; well-equipped laboratories, interactive exhibits, library; etc. which can be accessed by anyone with interest in science.

School Visits

The School Visit programme is conducted for school groups visiting the Centre, where the fun element of science is presented to the children in order to develop their interest. This programme is facilitated by a dedicated team. Specially designed sessions are conducted for the groups including Science Show, demonstrations, experiments, hands-on, group activities, games, innovative TLM, film, exposure to Centre's facilities, etc.



School Visits aim to develop students' inclination and liking for science. This is the first step towards encouraging them to explore various aspects of these subjects and eventually develop better conceptual understanding. The students are also introduced to the activities of the Centre and encouraged to participate in the regular programmes. As and when possible,

takeaway material is provided to children and their schools. Many schools have made visit to VASCSC, an integral part of their educational trips. Many students who visit the Centre as part of their school group, visit again on their own and many of them start participating in the Centre's activities regularly. Similarly, schools also participate in events or other activities of the Centre, following their visit.

7205 students and 433 teachers from 88 schools visited the Centre during the year. School groups from Ahmedabad as well as other places visited. The students belonged to different grades starting from pre-school to higher secondary. Many college and educational institution groups also visited and they too were engaged in interactive sessions according to their level.



Student Visits

The Centre's laboratories are well-equipped for conducting school-level practicals. Students make use of the lab facilities to perform science experiments requisite in school or to try out their new ideas. This is categorized as Student Visits where students visit the Centre individually to perform science practicals and investigatory projects. The necessary equipment, material and guidance are provided to students for their school projects, science fair projects and for trying out innovative ideas. The facilitation is provided by the Centre's educators. Around 3800 students from different schools performed practicals and projects in the Centre's labs.

"The way of presentation by performing experiments is really easy to understand for student. Solving puzzles by activity and revealing scientific concepts by different experiments is innovative."

- Riddhi M Patel, Lecturer
Soorajba College of Education, Kadi-Mehsana

The School Science Forum (SSF) is a year-long programme for students of Std. 5 to 9. It was launched on a large scale in 2011-12 with objective of making the learning of science and mathematics interesting and easy. The programme had its origins much earlier in 2004-05 as Saturday Science Forum programme which was conducted on smaller scale but its demand was steadily increasing. Thus, SSF was launched as a year-long programme, conducted on all days.

The programme intervention was started at std. 5 level when science is introduced as a formal subject in the curriculum, to develop interest and inclination of students. These are formative years and determine a student's life-long interest and aptitude for science; and are also motivating factor for taking up higher studies and careers in the field. This programme was initiated as an intervention to provide them with hands-on experience for developing conceptual understanding, and interest.

The programme duration coincides with the school academic year and the content is based on the school curriculum. The students get practical exposure to topics they learn at school and also receive continuous guidance over the year. This contributes to developing long-lasting understanding of difficult topics in science and mathematics, thereby helping students in school studies. SSF provides participants with opportunity to explore deeper into the subjects and develop positive attitude towards science and mathematics.

SSF has turned out to be very popular and in huge demand. Around 940 students from different schools of Ahmedabad enrolled in SSF in 2019-20. Most of these students have been enrolling themselves during successive years, as they had benefited from hands-on learning gained from the programme sessions. The

admissions process for academic year 2020-21 was also initiated and students enrolled for the programme beforehand. Huge rush for enrollment in std. 5 was received as usual and the online admission process which was introduced in the previous year made it easier and less time-consuming for the parents of students.



The programme sessions were conducted in different labs of the Centre by the trained team. For each standard, 30 sessions of one and half hour duration were conducted every week. This never-before opportunity to work in the science and mathematics labs, provided students with practical, hands-on experience in science learning which was generally not available to them. To strengthen their understanding of basic concepts, experiments and activities were conducted. Topics from Biology, Chemistry, Physics, Mathematics, Electronics, Computers, Environment, Space Science, Model Rocketry, Environment, etc. were covered to provide holistic understanding through interdisciplinary approach. This included curricular topics that required practical inputs, project-making, innovation, and educational visits. Educational visits were conducted for providing exposure to areas such as engineering, forensic science, 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

The school summer vacation is a time for students to engage in creative and innovative activities. VASCSC's Summer Programme has always been very popular among children for its activity-based approach and choice of topics it offers. Every year, a wide assortment of modules catering to children's varied interests and different age groups are presented. A variety of hands-on science, mathematics and technology-based modules are offered under this programme for participants to explore and learn with an element of fun. Effort is made to develop modules based on emerging trends to give the children an exposure to the latest in science. The modules are conducted in the Centre's well-equipped labs and spaces, facilitated by its trained resource persons.

The Summer Programme 2019 was conducted during 16 Apr - 9 Jun 2019 and offered total 191 batches of 66 different modules for participation. The response to the programme was excellent, with over 3100 participants. Many children came to Ahmedabad specially to participate in the programme.

Similar to previous years, the programme schedule was compiled in form of a brochure and distributed for wide dissemination of information and larger participation. The information was displayed on the Centre's website, social media and notice board. Most publicity was by word of mouth due to the positive experiences of participants from previous years. A dedicated helpline number was assigned to respond to the large number of queries.

Modules for children from Sr. KG and above were designed, with each module of 1-2 weeks' duration. These were designed so that each child could explore, create & learn through activities, experiments, model-making, games, etc. Themes like Astronomy, Aeronautics, Biology, Chemistry, Model Rocketry, Computers, Electronics, Mathematics, Physics, Robotics, Science Hobby, Photography were covered. Many new modules were introduced based on the latest trends and participants' feedback. These included Nanotechnology for Beginners, Know Your Body Systems, Turtle Graphics, 3D Modeling with 3DS Max, Introduction to Android, Certificate Course in Astronomy, DIY Microscope, 3D Printing Challenge, STREAM Projects, Hands-on Plant Biotech, Science Summer Camp and STEM Summer Camp. Details of The modules are given on following page.

Advanced B.Sc. (Physics)

VASCSC in collaboration with Gujarat Science Academy, St. Xavier's College, Ahmedabad; organized the Advanced B.Sc. (Physics) Summer Programme 2019 during 11 May - 1 Jun 2019 at St. Xavier's College. This residential programme was aimed at motivating students towards research and careers in Physics. The programme components included interactive lectures, problem tutorials, designing and building experiments and exposure to research institutes such as IPR, PRL, ISRO, etc. The lectures were taught by scientists from IPR and PRL, allowing students to interact with research scientists. 35 students from science colleges of Gujarat were enrolled after undergoing a tough selection process.



Summer Programme 2019 Module	Age Group	Duration	No. of Batches	Total Seats
CHEMISTRY				
Chem 4 Kids	Std. 1 - 4	1 week	8	160
Fun with Chemistry	Std. 5 - 8	1 week	8	160
Chemistry Investigations	Std. 9 - 10	1 week	2	40
BIOLOGY				
Little Scientist	Std. 1 - 3	1 week	10	200
Science Exploration	Std. 4 - 6	1 week	3	60
Microscopic Exploration	Std. 5 - 7	1 week	3	60
Know Your Body Systems	Std. 6 - 8	1 week	1	15
Biotech for Beginners	Std. 8 - 10	1 week	1	20
Biology Investigation	Std. 8 - 12	1 week	2	30
MATHEMATICS				
A Splash of Mathematics	Std. 2 - 3	1 week	5	100
Hurray!!! for Math	Std. 4 - 5	1 week	8	160
Fun with Math	Std. 6 - 7	1 week	3	60
Young Mathematician	Std. 8 - 9	1 week	2	40
COMPUTERS				
Fun with Computer	Std. 1 - 3	1 week	8	160
Me and My Computer	Std. 3 - 4	1 week	2	40
Picture Editing	Std. 5 - 7	1 week	2	40
Animation for Kids	Std. 6 - 8	1 week	2	40
Turtle Graphics	Std. 3 - 4	1 week	2	40
Introduction to Android	Std. 9 & above	1 week	1	20
3D Modeling with 3DS Max	Std. 7 & above	2 weeks	1	12
Python Programming for Beginners	Std. 7 - 12	2 weeks	1	20
PHYSICS				
Fun with Physics - Junior	Std. 5 - 6	1 week	6	120
Fun with Physics - Senior	Std. 7 - 9	1 week	6	120
All About Motors and Gears	Std. 3 - 5	1 week	2	40
ASTRONOMY				
Know Our Universe	Std. 7 - 9	1 week	2	40
Certificate Course in Astronomy	Std. 10+	1 week	1	20
AERONAUTICS				
Aeronautics Stage-1	Std. 6 - 7	1 week	2	30
Aeronautics Stage-2	Std. 8 - 9	1 week	2	30
MODEL ROCKETRY				
Single Stage Rocket	Std. 6 - 7	1 week	5	100
Water Booster Rocket	Std. 6 - 7	1 week	3	60
Advanced Water Booster Rocket	Std. 8 - 9	1 week	2	40
Cluster Engine Rocket	Std. 8 - 9	1 week	2	40
Double Stage Rocket	Std. 8 - 9	1 week	2	40
INNOVATION LAB				
DIY Microscope	Std. 8 - 12	1 week	2	30
Micro:bit - I	Std. 3 - 5	1 week	2	40
Micro:bit - II	Std. 6 - 7	1 week	2	40
3D Printing Design Challenge - I	Std. 4 - 6	1 week	2	30
3D Printing Design Challenge - II	Std. 7 - 8	1 week	2	30
3D Printing Design Challenge - III	Std. 9 - 10	1 week	2	30
Home Automation	Std. 8 - 12	1 week	1	15
ROBOTICS				
Fun with Robotics	Std. 8 - 12	1 week	2	30
Robotics Module - I	Std. 6 - 7	1 week	3	45

Summer Programme 2019 Module	Age Group	Duration	No. of Batches	Total Seats
Robotics Module - II	Std. 7 - 11	1 week	2	36
Robotics Module - III	Std. 7 - 11	1 week	2	36
LEGO Robotics - I	Std. 3 - 5	1 week	2	40
LEGO Robotics - II	Std. 5 - 7	1 week	1	20
STREAM Projects	Std. 3 - 5	1 week	1	20
Let's Make Drones	Std. 7 - 11	1 week	4	72
ELECTRONICS				
Electronics World	Std. 7 - 9	1 week	3	45
GENERAL SCIENCE				
Science Kids Zone - I	Std. 1 - 2	1 week	6	120
Science Kids Zone - II	Std. 1 - 2	1 week	1	20
Science Hobby Workshop - Junior	Std. 2 - 4	1 week	6	120
Explore and Learn	Std. 3 - 4	1 week	4	80
Super Science Funday	Std. 3 - 5	1 day	2	60
Book Buddies	Std. 4 - 6	1 week	3	45
Summer Science School - Junior	Std. 5 - 6	2 weeks	2	40
Science Hobby Workshop - Senior	Std. 5 - 7	1 week	6	120
Great Science Funday	Std. 6 - 7	1 day	2	60
Summer Science School - Senior	Std. 7 - 9	2 weeks	1	20
Nanotechnology for Beginners	Std. 6 - 8 / Std. 9 - 11	1 week	3	45
Learn Photography	Std. 5 & above	1 week	5	100
Introduction to Hands-on Plant Biotech	Std. 8 - 10	1 week	1	20
Science Summer Camp - Junior	Std. 2 - 4	1 week	2	60
Science Summer Camp - Senior	Std. 5 - 6	1 week	2	60
STEM Summer Camp - Junior	Std. 5 - 6	1 week	1	30
STEM Summer Camp - Senior	Std. 7 - 8	1 week	1	30



To mark the birth centenary year of Dr. Vikram Sarabhai, various initiatives were undertaken. This includes School Space Clubs, Model Rocketry Workshops, Publications and Wall Planner.

School Space Clubs

A unique initiative called 'School Space Club' was developed and undertaken by VASCSC to promote space education among school students. So far, VASCSC has promoted 180 Space Education Clubs to commemorate Dr. Vikram Sarabhai's Centenary Year.

While carrying different projects, VASCSC has shown its capabilities and expertise in conducting space science activities for students, teachers & community. The astronomy workshops, popular lectures, competitions, celebration of space science events as well as the kits and publications developed by VASCSC have been very helpful to students and teachers alike. There was a need to carry out more such interventions. The 'Space Club' was developed to provide an unparalleled opportunity to students for trying out new ideas, foster innovation and nurture creativity in the field of space science.

Space Clubs are a place to explore and interact. They offer experiential learning opportunities normally not available to individual space enthusiasts. A wide range of activities are available to club members who work

together in an atmosphere of team cooperation. A club environment allows the sharing of ideas and the opportunity to engage in projects beyond the resources or abilities of a single person. The club situation promotes individual creativity and competitive sportsmanship.

The Space Clubs aimed at providing platform to learn the basics of space science concepts and those related to Model Rocketry, Astronomy & Aeromodeling by participating and doing a variety of interesting activities. Students could explore these areas beyond the confines of school curriculum. They could keep updated about the latest developments in these fields and be equipped with the right knowledge and tools.

35 Space Clubs were set up in Gujarat, supported by Oracle and 20 Space Clubs were set up in Gujarat, supported by KHS Machinery to mark the Birth Centenary Year. VASCSC provided the necessary resource material and orientation, handholding, and technical support to these Clubs throughout the year.

Space Clubs for ISRO

VASCSC helped in promoting 125 Space Clubs across the country for ISRO, as a part of the Vikram A. Sarabhai Centenary Programme. This was through providing resource material, guidelines and training for implementation of the programme.



- **Resource Material:** A special Space Club resource material kit was prepared, which included science activities, demonstrations and models. The kit contained Water Booster Rocket Launcher, Single Stage Rocket Launcher, Space Science TLM, science & mathematics TLM, DIY kits, set of publications & posters, pen drive containing e-library, and other activity material. A diary was specially designed and given to each Club for planning and documentation of its activities. The diary also contained important astronomical events and the format for reporting. A School Space Club app was developed to accumulate limited amount of resources related to space science on one platform, which is freely available in the Android Play Store. 125 sets of this Space Club resource material were provided which would be used for setting up the Space Clubs in 125 schools across India, as identified by ISRO.

- **Training of Master Trainers:** ISRO identified some of its centers to undertake the Space Club activity as part of their outreach program. Training workshops for Master Trainers were organized at these centres where ISRO personnel were provided training on effective running of the Space Club and utilizing the resource for propagating space science activities in the schools. VASCSC resource persons imparted training on how to use different Teaching Learning Material to enhance understanding of space science at schools and how it could be used at different levels of education, like school and undergraduate level. The three major focal points like model rocketry, astronomy & aeronautics were covered through demonstrations, hands-on activities and discussions.

The training modules included introduction and demonstration of TLM, publications, posters and Model Rocketry activity. Every participant took part in hands-on activities like TLM preparation, water booster model rockets and single stage model rocket. Later, the model rockets were launched by the participants. The TLM was intended to be useful in demonstrating various



scientific principles to students while taking up the space club activity. Demonstration on how to use the Club Diary and School Space Club Application was given. The process of setting up and running the clubs, guidelines for organizing the clubs at various schools and events as well as the way forward, was discussed. With the training, the ISRO centres have actively taken up the outreach program and will contribute towards exciting the students about space science and related concepts. 7 training workshops were conducted at different ISRO centres, mentioned as follows:

Date	Venue	Participants
26 - 27 Aug 19	SDSC, Sriharikota	26
17 - 18 Aug 19	NRSC, Hyderabad	32
19 - 20 Sept 19	URRSC, Bangalore	8
23 - 24 Sept 19	SCL, Chandigarh	23
26 - 27 Sept 19	IIRS, Dehradun	6
30 Sept - 1 Oct 19	VSSC, Trivandrum	37
15 - 16 Oct 19	NESAC, Shillong	25
Total		157

157 personnel from 16 ISRO centres participated. In addition to scientists from the host ISRO centres, participants were also received from ADRIN, Hyderabad; RRSC Kolkata; RRSC Nagpur; RRSC Delhi; RRSC Jodhpur; LEOS Bangalore; ISTRAC Bangalore and ISTRAC Lucknow.

Model Rocketry Workshops for Students

VASCSC conducted 25 Model Rocketry workshops in Gujarat and Rajasthan, targeting students of std. 6-8 or std. 9-12. In these workshops, the participants themselves fabricated and launched water booster model rockets under the guidance of resource persons. Each school was given a set of resource material containing useful publications and a launcher, so that they could independently conduct the activity in future. 1412 students and 88 teachers from 25 schools participated in this activity.



Dr. Vikram Sarabhai's Birth Centenary

VASCSC team and children paid homage to Dr. Vikram Sarabhai on his Birth Centenary - 12 Aug 2019. Shri Kartikeya Sarabhai, Chairman, VASCSC Standing Committee and Shri Dilip Surkar, Director, VASCSC were present on the occasion. Shri Kartikeya Sarabhai narrated some amazing incidents from Dr. Sarabhai's life, giving a glimpse of his inspiring personality. This special day was spent by VASCSC in reflection and discussion on way forward. Dr. Vikram Sarabhai's Birth Centenary celebrations were initiated.



Science Wall Planner

VASCSC's Science Wall Planner 2020 was dedicated to Dr. Vikram Sarabhai and presented his role in nation building. It was replete with brief information about his major contributions and pictures, to give an idea about his work and multifaceted personality. 2000 copies were printed and widely distributed across the country.

Article in Current Science

Shri Dilip Surkar contributed an article on VASCSC to the Current Science magazine for their special issue to be brought out to mark Dr. Sarabhai's Birth Centenary.

Publication

A book titled 'Dr. Vikram Sarabhai - A Life in Nation Building' was published as a commemorative document on life and works of Dr. Sarabhai. The book covered different aspects of his work life and his unique human approach to institution building.



Space Science Gallery

A set of 6 posters on space science, were brought out to honour Dr. Vikram Sarabhai for his role as 'Father of India's Space Programme'. Each poster was 18"x 25" in size, illustrated with colourful graphics and presented in simple language. The topics included Earth's atmosphere and outer space, rockets and launch vehicles, communication satellites, small-scale satellites and Dr. Sarabhai's life. This set was part of the resource material given to Space Clubs.

Dr. Vikram Sarabhai's statue was unveiled at the hands of Hon'ble PM Narendra Modi on 19 Jan 2020 at Ahmedabad. The event was graced by presence of Hon'ble CM of Gujarat, Heads of institutions set up by Dr. Sarabhai and his family. Shri Dilip Surkar represented VASCSC at the occasion.



VASCSC, as Innovation Hub, aims to foster creativity and spirit of enquiry in children as a strategy to promote innovative way of thinking. This project is supported by the National Council of Science Museums (NCSM), Ministry of Culture, Govt. of India. Since beginning, the Centre has been carrying out innovative activities to improve the quality of Science education and also promote innovation and creativity. Under the Innovation Hub project, extension of these activities and scaling up was done. The facilities under Innovation Hub include:

- i) Discovery Hall having interactive exhibits to create excitement about science through exploration.
- ii) Hall of Fame which showcases innovative ideas or products that have transformed our world or have made significant impact on our lives along with their inventors and innovators
- iii) Idea Lab which includes Tod Phod Jod corner for students to pursue activities like model making, basic science experiments, design & fabrication of useful gadgets; and Kabaad se Jugaad corner focusing on making innovative & creative use of waste to highlight science around us
- iv) Design Studio for designing innovative products

The following activities were conducted by the Innovation Hub in 2019 - 20:

GenNEXT Innovators Workshops

The following workshops on emerging and innovative technologies were conducted for students under the banner of GenNEXT Innovators, at VASCSC:

- **Microcontrollers and Programming:** This 4-day workshop was conducted at IIT-RAM during 5 - 9 Aug 2019 in which 215 engineering students of the Institute participated. The workshop theme was 'Microcontrollers and Programming using Digispark Board'. The participants learnt about microcontrollers, basics of sensors and programming language. They got hands-on exposure on how to integrate basic components like LEDs with Digispark ATtiny85 board, how to integrate ultrasonic sensor with LEDs, trigger the LED by taking input from sensor, etc.
- **IoT and Home Automation:** This workshop gave exposure to students on the upcoming technology of Internet of Things (IoT). Participants learnt the concept of Smart Home, Smart City and how to connect smart devices with Internet. Students did programming in Arduino IDE and executed Home Automation program, used NodeMCU board and Blynk App to establish communication between



appliances, sensors and smart phones through cloud. The first workshop was organized on 23 Oct 2019 for students of std. 7-9. The second workshop was organized on 21 Nov 2019 in which 21 students of std. 8 & 9 participated.

- **Raspberry Pi Basics:** Raspberry Pi is a single board computer which works as a pocket size CPU. In these hands-on workshops, participants learnt about computing and coding using Raspberry Pi and got to build, program and modify this fully functional DIY microprocessor platform. One workshop was organized on 24 Oct 2019 for students of std. 7-8. The second workshop was organized on 22 Nov 2019 in which 18 students of std. 9 participated

- **PCB Prototyping:** This workshop was conducted on 19 Nov 2019 in which 15 students of std. 8 & 9 participated. Content included PCB prototyping from schematic to fabrication. Participants learned how to design and develop a PCB through hands-on experience and explored the process of circuit design, EasyEDA software, development of PCB board, etc.

- **Arduino and Sensors:** This workshop was conducted on 20 Nov 2019 in which 19 students participated. They were introduced to Arduino and learnt how to write programs using the Arduino IDE & how to interface different inputs & outputs with board.



- **3D Printing:** This workshop was conducted on 23 Nov 2019 in which 17 students of std. 8 & 9 participated. This comprehensive workshop highlighted key features of 3D printing which includes 3D design, 3D Slicing, 3D printing and post processing. Students were introduced to TinkerCAD software through hands-on sessions.

- **Robot Kinematics & Dynamics:** This workshop was conducted on 24 Nov 2019 in which 20 students participated and learnt the concept of Forward and Inverse Kinematics, Degree of Freedom and the use of servo motors with Arduino to move the end-point of a planar robot on a specified trajectory.

- **Pyrotechnics:** This workshop was conducted on 25 Oct 2019 for children of std. 5 -10 on occasion of upcoming Diwali festival. Students were introduced to the basics of pyrotechnics, heat, light, smoke, gas, combustion reaction, heat of reaction, rate of reaction, eco-friendly crackers, safety protocols, etc. through spectacular demonstrations and hands-on activities.



Investigatory Projects

The Design Studio encourages school and college students to convert their ideas into reality. They can utilize this facility to create and design innovative projects. Some creative projects on which work was initiated by students and Innovation Hub team include path detection for automated cars using image processing, 3 D printed periodic table, robot which cleans the house automatically, 5V Power Bank to supply power to small devices like Arduino, any individual circuit and for charging mobile phones, Spider Robot which can walk on all terrains, 3D Printer Parts, wireless transmitter for spider robot, Bubble machine, Harmonograph, Cyanotyping using Photosensitive reagents, Drawing board, Reverse Perspective, Clinostat apparatus, Digital Pocket Microscope, Portable and economic centrifuge machine, Portable 3D printed 3D printer, Vortex, and Robotic fish for underwater surveillance.

Young Science Innovators Fellowship

The Young Science Innovators is a unique fellowship programme, specially designed for underprivileged students to inspire them to become innovators and creators, and be able to solve real life problems. The programme was supported by Manorama Sheth Fund and Dr. Sureshbhai D. Bhatt Charitable Trust.



After its success in 2018-19, the second batch was inducted. 21 students from various govt. and semi-govt. schools were selected through a specially designed creativity & innovation test, in which 148 students appeared. Under guidance of VASCSC mentors, they identified real life problems and came up with projects on some innovative solutions. While working on their ideas and prototypes, they also learnt operation of basic science & mechanical equipment, and basic computer skills. It was observed that out-of-the-box thinking and problem-solving approach developed among the children and they could freely express their ideas by the end of this programme.

Modules in Summer Programme

As extension of Innovation Hub activities, many modules focusing on innovation, emerging technologies, programming, coding, robotics, etc. were conducted during the Summer Programme conducted during 16 Apr - 9 Jun 2019. The modules were designed such that the students could explore, try out new ideas and innovate. The following modules were conducted:

- **DIY Microscope:** 2 batches conducted, 30 students of std. 8-12 participated. They built a digital microscope and learnt about Raspberry Pi.

- **Micro:bit:** 4 batches conducted, 80 students participated. 2 batches conducted for std. 3-5 while 2 batches for std. 6-7. They learnt about uses of programming and electronics by making fun gadgets using Micro:bit platform.

- **3D Printing Design Challenge:** 6 batches, 90 students participated. 2 batches each were conducted

for std. 4-6, std. 7-8 and std. 9-10 students. They used 3D design and 3D printing to solve challenges to lead to better understanding of the technology.

- **Home Automation:** 15 students of std. 8-12 participated, made gadgets to control home appliances using wi-fi based IoT devices.

- **Robotics:** Several modules each having multiple batches were conducted for students to learn about robotics through construction of different robots.

- Fun with Robotics: 2 batches, 40 participants of std. 8-12, used nodeMCU & fabricated smartphone-controlled robots that could counter obstacles.

- Robotics Module - I: 3 batches, 45 participants of std. 6-7 fabricated a simple mechanical robot with electromagnetic arm.

- Robotics Module II: 2 batches, 30 participants of std. 7-11 fabricated Bluetooth- controlled, Arduino based Pick & Place Industrial Robotic Arm.

- Robotics Module III: 2 batches, 30 participants of std. 7-11 fabricated Bluetooth- controlled, Arduino based Spider Robot.

- LEGO Robotics: Total 3 batches, 60 students participated. 2 batches conducted for std. 3 - 5 while 1 batch for std. 5-7.

- STREAM Projects: 20 participants of std. 3 - 5, performed interdisciplinary projects using different robotics platforms & programming.

- **Introduction to Android:** 20 students of std. 9+ participated and created simple Android app.

- **3D Modeling with 3DS Max:** 12 students of std. 7+ participated, learnt about this software which is used in architectural illustration, animation, product modeling, video games, industrial design, etc.

- **Python Programming for Beginners:** 20 students of std. 7+ learnt about this software which is first step towards Android-based software development.

- **Animation for Kids:** 2 batches were conducted, 40 students of std. 6 - 8 participated and learnt 2D animation in Macromedia Flash.

- **Turtle Graphics:** 2 batches conducted, 40 students of std. 3 - 4 participated and learnt this interactive programming language.

- **Nanotechnology for Beginners:** 3 batches were conducted in which 45 students of std. 6 - 8 and std. 9 - 11 participated.

- **Let's Make Drones:** 4 batches, 72 students of std. 7-11 participated. They made Quadcopter, learnt about accelerometer sensor, microcontrollers and wireless communication in designing & controlling a multirotor.

- **Biotechnology for Beginners:** 20 students of std. 8 - 10 participated and learnt about biotechnology through hands-on activities like DNA extraction, Agarose Gel Electrophoresis, etc.

- **Introduction to Plant Biotech:** 20 students of std. 8 - 10 participated and performed hands-on activities like plant DNA isolation, viewing, making desktop explant through different biotechnological processes, etc.

ATL Workshops supported by IBM India

- **Teachers Training Workshops:** Innovation Hub conducted 7 training workshops for teachers involved with Atal Tinkering Labs (ATL). 325 teachers from 318 schools participated and learnt about process of innovation through activities like physical design and fabrication, electronics & coding, problem definition, solution ideation, digital fabrication, prototype demonstration, and using online resources. They learnt how to use instruments in ATL like 3D Printer, Arduino, various mechatronic kits and relevant software to create customized teaching aids.

- **ATL Student Workshops:** Innovation Hub team conducted 9 hands-on training workshops for students of std. 6-12 from ATL schools. The aim was to introduce them to various tools and equipment of the ATL. Topics included innovations that changed the world, design thinking, different types of sensors, through hands-on activities on micro controller Arduino Uno board and BBC Micro:bit, etc. 800 students from 25 schools participated.





With the support from Oracle, VASCSC is working on the project 'Innovation in Science and Mathematics Education' since 2016. The project was once again implemented successfully in 2019-20.

Activity	No.	Schools	Students	Teachers
Group Visits to VASCSC	-	88	7205	433
Outreach Programme	-	70	7211	330
Teachers Training Workshops	4	177	-	219
Space Education Programme				
- Model Rocketry Workshops	15	15	766	58
- Space Education Clubs	35	35	7700	118
Computer Teachers Training	5	103	-	103
Total		488	22882	1261

The continued partnership with Oracle provided avenue to take innovative science and mathematics education activities to more students and teachers. The objective was to cultivate innovative approach and scientific temper and to provide an opportunity for them to understand basic science concepts through experiential learning. Learner-centred and hands-on approach was used for effective learning. Through the project activities, VASCSC directly reached out to 22882 students and 1261 teachers from 488 schools, primarily in Gujarat. The indirect reach of the project has been much more. The project components are:

1. Group Visits to VASCSC

The labs and facilities at VASCSC house interactive exhibits, models, TLM, etc. that encourage visitors to experiment and explore. The use of exciting resources, coupled with guidance from resource persons, provide a wholesome learning experience to students and teachers visiting the Centre. The hands-on approach creates an opportunity of 'learning by doing'. For the school and institution groups visiting VASCSC, interactive sessions of 2-3 hours' duration, were conducted by Centre's resource persons.



The sessions were designed keeping in mind the interest and age group of the participants. Innovative activities were introduced to cater to the curiosity of students and encourage them to work on their ideas. After the session, they were facilitated through the labs, Science Playground, and Discovery Hall. 7205 students and 433 teachers from 88 schools visited the Centre and participated in these activities

2. Outreach Programme in Schools

Students in remote or rural areas have limited access to quality science education which affects their interest towards it. The Outreach Programme was conducted to provide students an exposure to scientific facts and phenomenon and the latest happenings in the field of science through hands-on involvement, right in their schools. The resource persons visited schools and conducted interactive sessions of 2-3 hours comprising innovative science and mathematics hands-on activities, demonstrations and provided some useful TLM to the schools. Activities were conducted keeping in mind the level of the school students. New activities were added based on previous year's experiences and feedback. Students were provided orientation on innovation, followed by activities and demonstration of TLM. The Outreach Activity was conducted with 7211 students and 330 teachers from 70 schools.



3. Teachers Training Workshops

A teacher plays an important role in developing a child's understanding through the best use of resources, skills and experiences. Different teaching methodologies are adopted in teaching-learning process depending on subject and topic. Hands-on methodology is effective for teaching science and mathematics. To build the capacity of science and mathematics teachers and educators on hands-on



and innovative approach, four training workshops were conducted at different locations. These workshops titled 'Innovative Approaches in Science and Mathematics Education' received 219 participants from 177 schools. The schedule of the workshops was prepared keeping in mind the difficulties faced by teachers. Standard appropriate hands-on activities were conducted in these two-day workshops. On conclusion of the workshop, useful teaching learning material and certificate was given to each participant. The details of the workshops are given in the following table:

Date	Location	Subject	Teachers
25 - 26 Jul 2019	Vadodara	Science & Maths	41
30 - 31 Aug 2019	Kadi	Maths	46
6 - 7 Sep 2019	Valsad	Science & Maths	62
6 - 7 Sep 2019	Valsad	Science & Maths	70
Total			219

4. Space Education Programme

Through the Space Education Programme, the Centre directly reached 8466 students, 176 teachers in 40 schools. This component had two interventions:

• Model Rocketry for Innovative Learning in Schools

Model Rocketry activity allows young children to fulfill their curiosity towards rockets. Constructing and launching model rockets is an exciting and thrilling experience, tapping in the imagination and creativity of children. It is an opportunity to teach several science & mathematics concepts and develop skills like observation, measurement, calculation, etc. This is a popular activity in which participants learn to build model rockets from easily available simple materials. They are encouraged to experiment with their designs and come up with new ideas in rocket fabrication.

VASCSC team conducted 15 Model Rocketry workshops at 15 schools in Gujarat and Rajasthan, targeting students of std. 6-8 or std. 9-12. The

participants themselves fabricated and launched water booster model rocket. This model was prepared from PET bottles, and the thrust for rocket's takeoff was provided by mixture of water and compressed air. While performing this creative activity, students learnt about concepts like inertia, gravity, air resistance, Newton's laws of motion, acceleration, work, energy and momentum. Each school was given a set of resource material containing useful publications and a launcher, so that they could independently conduct the activity in future. 766 students and 58 teachers from 15 schools participated in this activity. The workshop details are as follows:

Name of the School	Date
Shri Naklank Gurukul, Morbi	2 - 3 July 2019
Shree CG Mehta Vidhyamandir, Umedgadh	5 - 6 July 2019
Purohit Science School, Jamnagar	7 - 8 July 2019
Shree Govt. High School, Gadu	13 - 14 July 2019
Abhinav Sen. Sec. School, Udaipur	16 - 17 July 2019
MDS Public School, Udaipur	19 - 20 July 2019
Acharasan Primary School, Kadi	25 - 26 July 2019
Shree MSV High School, Bhuj, Kutch	7 - 8 Aug 2019
HJD Institute, Kutch	9 - 10 Aug 2019
Shree SC Dani School, Kapadwanj	13 - 14 Aug 2019
Kalyani School, Atul, Valsad	20 - 21 Aug 2019
Lakshaya International School, Ahmedabad	28 - 29 Aug 2019
Chhapi Pay Centre School, Mehsana	12 - 13 Sept 2019
Madhuri Mansukhlal Vasa High School, Koba	12 - 13 Dec 2019
Shree DJ Patel Kanya Vidyalay, Kadi	17 - 18 Dec 2019



• Setting up Space Education Clubs in Schools

'School Space Education Club' is a unique initiative to promote space education. This programme provided a platform to learn the basics of space science concepts including Model Rocketry, Astronomy, Aeronautics and Satellites. VASCSC provided necessary handholding, technical support, resource material & orientation to the 35 Space clubs set up in

various schools under the project. Out of the 35 Clubs, 25 were set up in the previous year. In the current year, 10 Space Clubs were set up in the following schools:

1. Lakshaya International School, Ahmedabad
2. Shri Rajnikant Vyas and Chandraketu Pandya School, Ahmedabad
3. Ellisbridge School No. 10, Ahmedabad
4. Smt. C. D. Gandhi English Medium School, Dakor
5. Anjuman High School, Malekpore, Dist. Surat
6. Shilaj Primary School, Ahmedabad
7. Best High School, Ahmedabad
8. Aryam Educational Academy, Kim, Dist. Surat
9. Deepak High School, Amreli
10. Shreyas Foundation, Ahmedabad

Two orientation workshops were conducted to guide the teachers in carrying forward the activities in their schools. One workshop was held on 4 Sept 2019 and the other was held on 27 Feb 2020. The material and equipment was handed over to the teachers to initiate the activity. This included set of relevant publications, model rocket launcher, inclinometer, pen drive containing e-library, and Club banner. A diary was specially designed and given to each Club for planning and documentation of activities. It also contained important astronomical events and reporting format. A newsletter covering the events conducted at respective schools was brought out. A Space Club mobile app was developed and released on the occasion, which is available on Google Playstore. A new feature was added in the App (Finding one's weight and age on different planets).



5. Computer Teachers Training

To update and equip teachers with skills and knowledge to teach computers more effectively, 5 training workshops titled 'Training of Teachers in Computer Education' were conducted for teachers of std. 6-8. Each workshop's duration was two and half days. For smooth implementation and to reach govt. school teachers, collaboration was worked out with



GCERT & DIETs. The focus was on orienting teachers to standard appropriate concepts and recommended software as well as open source software. Priority was given to govt. school teachers and trainers engaged with education of underprivileged children. Useful resource material and certificates were given to participants. Total 103 teachers from 103 schools were oriented. The workshop schedule is as follows:

Date	District	Participants
22 - 24 July 2019	Dahod	18
25 - 27 July 2019	Santrampur (Godhra)	24
30 July - 1 Aug 2019	Jamnagar	21
16 - 18 Sept 2019	Rajpipla	19
19 - 21 Sept 2019	Bharuch	21
Total		103

6. Developing Innovative TLM

VASCSC is continuously working on developing new TLM as well as carrying out improvements of existing TLM. This is useful in teaching learning of science and mathematics at school level. Development work of Interactive exhibits was also carried out, which can be displayed in the Centre's open spaces and accessed by people of all age groups.

Under this component, innovative resource material consisting of TLM, publications, posters, models, games and puzzles, etc. were developed. Work was initiated on English resource material such as Mathematicians of the World (set of 26 charts), Joy of Chemistry - Junior, Mathematical Puzzles, Science Gallery, DIY- Virtual Reality Box, Science Fiction stories, Learning Science through Model Rocketry, Famous Scientists (set of charts), Do It Yourself Manual, Joy of Mathematics. The Gujarati material that was initiated included Mathematicians of the World (set of 26 charts), Vigyan Drishti, DIY- Virtual Reality Box, Science Fiction stories, Joy of Chemistry (Junior), and Microscopic Structures.

With support from IBM India, since 2014 VASCSC has conducted hands-on teachers training workshops in which over 4200 govt. primary school teachers from Gujarat participated. In 2018, new capacity building initiatives focusing on Innovation and Artificial Intelligence (AI) were introduced for teachers and students, to keep up with the latest trends and emerging technologies. In 2019-20, the project with IBM India involved the following components:

1. STEM Teachers Training Workshops

A series of Teachers Training Workshops on 'Hands-on Approaches in STEM Education' were conducted for govt. school teachers. For these workshops, collaboration was worked out with GCERT and were conducted at district-level at respective DIETs. The two-day STEM Teachers Training Workshop on had three major components:



(i) Training Workshops: The workshop included hands-on activities as well as demonstration of different activities related to STEM. The training was conducted by VASCSC resource persons.

(ii) Orientation to TTS website: An orientation to the Teachers TryScience website was given to enable web-based learning. The concept of a website for teachers was highly appreciated.

(iii) Resource Material: Innovative TLM was provided to develop curiosity and interest for learning science and mathematics. These publications served as a reference material and also an interesting reading on the subjects for teachers and students. The publications were in Gujarati.

Date	District	No. of teachers
11 - 12 July 2019	Patan	51
24 - 25 July 2019	Kheda	50
6 - 7 Aug 2019	Anand	55

"The most interesting part of the workshop was we made working model individually. The timing of the teachers training should be for more days. It was the first time we got to know about the concept of STEM Education. The website is also very good."

-Ms. Komal Sarvakar, Golapur Primary School, Patan

2. ATL Teachers Training Workshops

The Govt. of India has established Atal Tinkering Labs (ATL) in schools across India to foster curiosity and creativity of young minds and inculcate skills to make them future-ready. During 2019-20, seven training workshops titled 'Unbox tinkering' were conducted by VASCSC for Atal Tinkering Lab teachers to give a boost to innovation culture in the country. 325 teachers from 318 schools participated in the workshops.

The objective was to understand the importance and key working principals of ATL. The participants were oriented to the equipment and material in the ATL labs in their schools. They were given an intensive experience to the process of innovation through activities incorporating team thinking, physical design and fabrication, electronics and coding, problem definition, solution ideation, digital fabrication, prototype demonstration and presentation, and using online resources effectively. Teachers used instruments in ATL as well as other resources like 3D Printer, Arduino, various mechatronic kits and relevant software to create customized teaching aids.



"The training was so good, along with demonstration, methodology is excellent. Organize the training programme time to time if possible"

- Mr. Javed Khan, Mission HS School, Chhapara

The teachers interacted with technology experts and mentors and took part in numerous hands-on activities. The workshops were designed for teachers to learn innovation skills, shape up their ideas, work and learn in a flexible and creative environment. The participants were provided with an opportunity to work with the 21st century skills like critical thinking, design thinking, computational thinking, leadership; and systematic help to nurture innovation among youngsters to solve India's unique problems. Some details of workshops are as follows:

Date	Location	No. of teachers	No. of schools
28 - 31 Aug 2019	Nagpur	38	37
11 - 14 Sept 2019	Udaipur	48	47
9 - 12 Oct 2019	Pune	41	40
16 - 19 Oct 2019	Jaipur	39	39
11 - 14 Dec 2019	Indore	52	51
18 - 22 Dec 2019	Jabalpur	49	47
11 - 14 Feb 2020	Kolhapur	58	57
Total		325	318

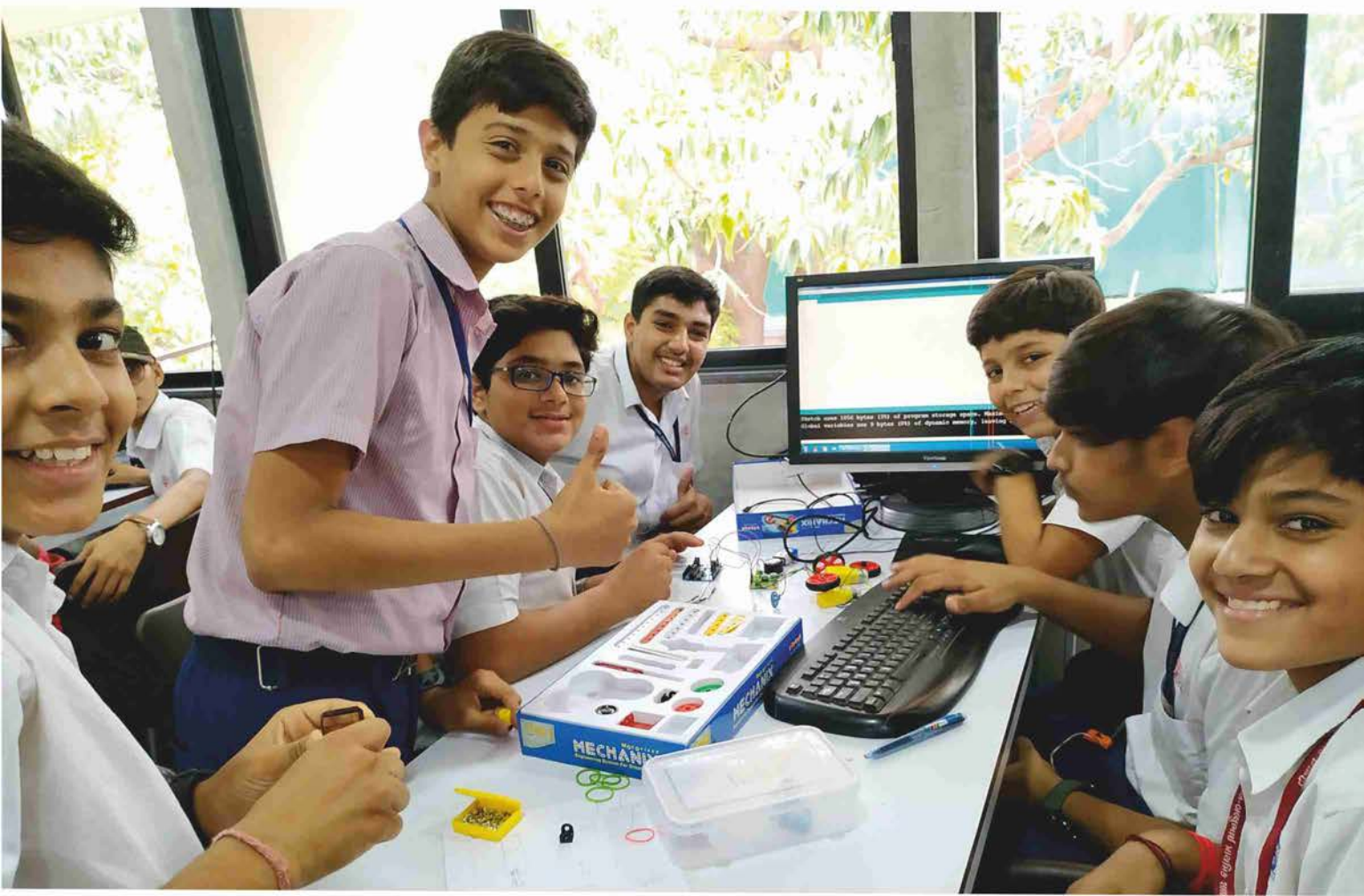
3. ATL Student Workshops

The ATL Workshops were conducted for students of std. 6-12 from ATL schools. These two-day workshops were aimed at introducing the budding innovators to various tools and equipment of the ATL. Students got a

firsthand experience of design thinking and how it can be used to take an idea from prototype to product. They were made to implement STEM learning to solve problems related to community, with limited resources. Students also tried their hands at popular prototyping platform - Arduino and learn its versatile uses. Total 800 students participated.

Topics covered included innovations that changed the world, design thinking, and introduction to different types of sensors through hands-on activities on microcontroller Arduino Uno board and BBC Micro:bit. The workshop details are given in the following table:

Date	Venue	Students
4-5 Apr '19	CN Eng. Med. School, Ahmedabad	110
9-10 Apr '19	Sunrise Public School, Bansur	100
11-12 Apr '19	Subodh Public School, Jaipur	100
19-20 Jun '19	Deepak High School, Amreli	100
21-22 Jun '19	Anand Niketan, Shilaj, Ahmedabad	80
26-27 Jun '19	Diwan Ballubhai School, Ahmedabad	100
13-14 Aug '19	Sanskardham School, Ahmedabad	90
29-30 Jan '20	Ryan International School, Surat	60
7-8 Feb '20	Gyanda Girls School, Ahmedabad	60
Total		800



IX

With support from Schlumberger, VASCSC set up 11 Science Activity Centres in Barmer district of Rajasthan, followed by teachers training workshop. The objective of the project was to improve the quality of science and mathematics education in schools by providing practical exposure to students for better and lasting understanding of concepts; and by equipping teachers with capacity and skills to achieve the same.

These school-level science activity centres were set up as a dedicated space in school where children could engage in hands-on learning of science and mathematics, especially in absence of labs. The focus was on developing understanding of difficult concepts from school curriculum through hands-on experience and practical exposure. The components of the activity centre included models and teaching aids, interactive displays, exhibits, kits for performing experiments and demonstrations, hands-on activity kits, mathematical puzzles and brain sharpeners, charts & publications. The Activity Centres were set up at DIET Barmer and

Science Activity Centres

Govt. Senior Secondary Schools at Dhandlawas, Nagar, Chokhala (Fulasar), Nagana, Kawas, Kau Ka Khera, Chittar ka Par, Baitu Panji, Madupura Barwala and Baitu Girls School. This was followed by teachers training workshop for the teachers of these schools on 'Hands-on Approaches in Science and Mathematics Education' to build their capacities for effective science teaching, conducted on 19 Sep 2019 at DIET Barmer.



X

'Joy of Science - Mobile Science Lab & Exploratory' (MSL) is a unique lab-on-wheels which aims to take the lab experience to underprivileged children, right in their school premises. Students got opportunity for hands-on learning which would be helpful in understanding difficult concepts with fun and ease.

With support from NCSTC, Dept. of Science and Technology, the Centre initiated MSL to reach out to schools in Gujarat, especially those having no or very little access to laboratory facilities. The first phase which concluded in August 2019 was successful and had participation of 33673 students & 1279 teachers from 119 schools. These primarily included schools

Mobile Science Lab

from the aspirational district of Dahod and schools from interior, rural and peri-urban areas. The vehicle for the Mobile Lab was procured from grant by KHS Machinery. The preparations for the second phase to be run during 2020-2021 were also initiated.

The MSL was designed not simply as an exhibition but as an unforgettable experience for each student that attended the sessions. The Lab carried the necessary equipment, gadgets, kits, consumables and other items required to perform curriculum-based science and mathematics sessions. A team of Science Communicators accompanied the Joy of Science mobile lab and facilitated students in the activities.

Each school received one day of intense intervention. The schedule of MSL included demonstrations, hands-on activities, interactive exhibits, panels, quiz and science games, all developed in line with the school curriculum. Students got to carry back with them the models that they prepared. Simple science material like booklets, etc. was given to children as prizes. Students were individually engaged in the hands-on sessions. The content was covered keeping in mind the age group of students as well as their on-going topics in class. Each school was provided with a set of useful resource material in Gujarati.



With support from KHS Machinery Pvt. Ltd., VASCSC has been conducting VASCSC Science School, an experiential learning programme, since 2015. This year the programme was conducted during 3 - 7 Mar 2020, to give underprivileged children a unique hands-on and creative learning platform. 111 students of std. 6-8 from 6 schools of Ahmedabad participated, viz. Hirapur Primary School, Harniyav Primary School, Badodara Primary School, Bhuval Primary School, Bhitiya Primary School & Rampura Primary School.



The programme was inaugurated in presence of Dr. Nirja Sharma, Head-CSR, KHS; Shri Dilip Surkar, Director, VASCSC; and representative teachers and principals from the participating schools. A recorded video message by Shri Yatindra Sharma, MD, KHS Machinery was played at the inauguration where he encouraged the children to make the most of this unique opportunity presented before them.

The aim of the intensive programme was to provide a learning experience to students where they could try their hands at fun-filled activities and learn about various scientific concepts easily. The focus was on imparting difficult concepts in a simple and practical manner. Students were provided exposure to emerging technologies and their application in day-to-

day life. The programme content included mostly curricular, and some general interesting concepts from science & mathematics. Physics, chemistry, biology, mathematics, astronomy, environment, robotics concepts were incorporated. Methodology like hands-on activities, simple experiments, demonstrations, model-making, presentations, videos, group work, etc. were used. The topics were correlated with curriculum so that students could understand difficult topics with fun and find it useful in regular studies. This was a unique lifetime experience for the students as they were visiting a science centre and labs for the first time. Here, they got the opportunity to actually perform science experiments and activities and handle scientific equipment.

Fun-filled hands-on science & mathematics sessions were conducted daily. Participants performed simple experiments, activities and made models based on various topics. They prepared models like 3D shapes, lens camera, stethoscope, sundial, fossils, water level indicator, paper planes, epoxy resin blocks and magnetic butterfly and understood related concepts. The participants carried back the models with them so that they could explore at home and also share it with other children. They conducted simple activities like using a microscope & preparing slides, multiplication tricks, muscle contraction, chemiluminescence, soap bubbles, light sensitive reactions, etc. They enjoyed science show and demonstration of model rockets, etc. Exposure to emerging technologies like Robotics, Internet of Things (IoT) and 3D Printing was provided.

The programme concluded on 7 Mar 2020 with a valediction ceremony. The children were awarded with certificates and set of resource material consisting of science, mathematics and environment publications, puzzles and kit. A set of resource material was also given to each school.



In addition to the activities mentioned in the previous chapters, various other activities were conducted which are mentioned as follows:

VASCSC Astronomy Lab

Earlier, Astronomy activities at VASCSC were being implemented from the Physics and Model Rocketry labs. With support from Systronics India, a dedicated Astronomy lab was constructed on the third floor of the building. The new lab having easy access to the terrace, is ideally located for sky observations. The Lab was inaugurated on 4 Mar 2020 at the hands of Shri Mohal K. Sarabhai, Chairman, Systronics India. Shri Kartikeya V. Sarabhai, Shri B. S. Bhatia, Shri Dilip Surkar and representatives from Systronics graced the occasion. This new and improved facility having necessary equipment and features, has given a boost to ongoing Astronomy activities at the Centre and scope for implementing new ideas.



Upgradation of Seminar Facility

The Seminar Hall 4 is spacious and used for conducting School Visits, Teachers Training Workshops and other activities of the Centre. With support from Vovantis Laboratories, this facility was upgraded to prepare it as better learning facility and to optimize its usage.

Capacity Building of Teachers

Many teachers training workshops are conducted by VASCSC for science education professionals and school teachers. They were oriented towards hands-on approaches in teaching to build their confidence for transacting science and mathematics concepts in their classroom effectively and developing interest of students towards science. The following capacity building initiatives were conducted during 2019-20:

- Teachers training on 'Hands-on Approaches in Mathematics Education' was conducted during 26 - 27 Dec 2019 at Dr. Mohan Sinha Mehta Rural Training

Centre, Kaya in Rajasthan. The workshop was organized by Seva Mandir Training Centre, Udaipur. 28 teachers participated.

- 4 teachers training workshops were conducted during 4 - 5 Jan 2020 at Silver Oaks School, Hyderabad. Out of these, 2 were titled 'Hands-on Approaches in Mathematics Education' while other 2 were titled 'Hands-on Approaches in Science Education'. Total 106 teachers from std. 1-10 of the school participated.



- Training workshop titled 'Orientation on Mathematical Model Making' was conducted on 20 Feb 2020 at VASCSC. 12 teachers & undergraduate students from R D National College of Science, Mumbai participated.
- These workshops were conducted in addition to the 3 workshops on STEM education and 7 ATL workshops supported by IBM India; as well as 4 science & mathematics workshops and 5 computer teachers training workshops supported by Oracle.

Workshops for Children

- VASCSC team exhibited its innovative work and TLM at the International Conference on Sustainability Education (ICSE 2019) held during 9-10 Sept 2019 at New Delhi. A 'STEM is Fun' session was also conducted on 10 Sept 2019 for students, to give them an exposure to hands-on approaches in STEM learning. Mathematics, astronomy, model rocketry and science were presented through demonstrations, games and hands-on activities. Model rocket launching was also carried out. Around 250 students of std. 9 -10 from India and Australia, participated.
- VASCSC team conducted hands-on Science Workshops for children during 16 - 24 Nov 2020 at Amdavad National Book Fair (ANBF) 2019 organized by AMC. Exciting activities and demonstrations of chemistry, astronomy, biology, mathematics, physics & model rocketry were conducted. Around 1200 students and 52 teachers participated.

- VASCSC team conducted two sessions for students of INSPIRE camp at Vel Tech University, Chennai on 25 Jan 2020. The sessions included demonstrations and hands-on activities. Around 300 students participated. VASCSC has been conducting these activities since the past few years.

Radio Programme

A 52-episode radio series in Gujarati titled 'Agandhara' was developed based on the theme of Global Warming and Climate Change with the support of All India Radio and Vigyan Prasar. The series started on 20 May 2019. It was broadcast from Akashvani's Ahmedabad, Vadodara, Rajkot, Bhuj and Godhra stations every Monday during 9:30 - 10:00 pm (846 KHz MW AM).

National Olympiad Test

The National Standard Examinations for National Olympiad conducted by IAPT were held at VASCSC. The Junior Science Exam was conducted on 17 Nov 2019 in which 215 students appeared. The exams for Physics, Chemistry, Biology, and Astronomy were held on 24 Nov 2019 in which 2225 students appeared.

VASCSC Library - a unique facility

The Centre's library houses a collection of Science and Mathematics reference books, including children's books and reference material for high school and college students. The library is continuously upgraded with new collections and reference materials. It conducts popular programme Book Buddies to develop students' interest in reading and books.

HCL Grant 2020

VASCSC was finalist in the HCL Grant 2020, selected through a competitive nation-wide process. It received grant for a project to be carried out in the following year. Under the project, it is proposed to conduct 12 teachers training workshops for govt. school teachers in Gujarat. VASCSC's work was also profiled in the coffee table book 'The Fifth Estate Volume IV'.

VASCSC Science Shop

The Science Shop makes the material developed by the Centre, available to the general public. Several new products were introduced during the year. This material was popular and received demand from schools, students and teachers across the country. A brochure-cum-price list was brought out for publicity. For wider reach, Science Shop products were made available online through www.scienceshop.vascsc.org.

This year, the products were listed on Amazon.in website through which the visibility and demand of the products increased. The Science Shop exhibited its products at the following events:

- International Conference on Sustainability Education (ICSE 2019) held during 9-10 Sept 2019 at New Delhi
- Amdavad National Bookfair (8th ANBF) organized by AMC during 14 - 24 Nov 2019 at Ahmedabad
- 3rd Ahmedabad Mega EduFest during 21-22 Dec 2019.

TLM for Schools

The VASCSC TLM is being used by many schools, teachers and students across the country for hands-on science and mathematics learning. The material is popular due to its effectiveness in the teaching learning process, cost and durability. Some notable instances in this year included:

- Science and mathematics TLM set was given to 66 Kasturba Gandhi Balika Vidyalayas in different districts of Gujarat through SSA
- Science and mathematics TLM sets were procured by 25 ITIs in different districts of Gujarat. This was followed by a training workshop.

Geometry Club

The activity of Geometry Club at VASCSC was started by Prof. A. R. Rao 16 years ago. Dedicated geometry enthusiasts meet every Saturday, throughout the year. They discuss interesting geometrical results and solve challenging problems.



VASCSC is engaged in development and dissemination of science and mathematics Teaching Learning Material (TLM) to make the process of teaching and learning effective for the teachers and students. Effort is made to provide quality yet cost-effective resource material which helps make the understanding of science and mathematics concepts easy, better and long-lasting. This TLM includes kits, books, charts, models large exhibits, puzzles, etc. This material can be used at various levels including primary and secondary school level, ages 3+ as well as group sizes including classroom and individual learning. Some products have gained popularity as gift items. The manuals accompanying the models and kits are primarily trilingual - English, Gujarati and Hindi. The publications are either in English, Gujarati and some in Hindi. This has ensured wider reach of the material to the target group across India.

In 2019-20, several existing publications were reprinted in large numbers as a result of their increasing demand. Some new material was developed as products and disseminated through the Science Shop or as part of Centre's various projects. The following material was developed:

Science Wall Planner

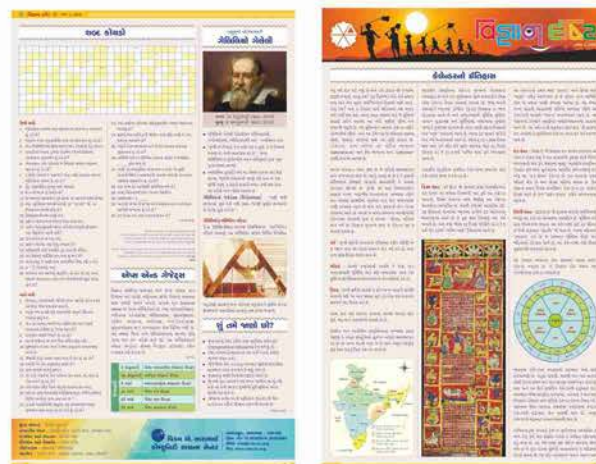
VASCSC's Science Wall Planner is a unique theme-based publication in English, containing useful scientific information. The Science Wall Planner for 2020 was dedicated to Dr. Vikram Sarabhai and presented his role in national building. It was replete with brief information about his major contributions and pictures, to give the reader an idea about his work and multifaceted personality. In addition, the Wall Planner contained the regular features like national and international days that are observed to mark important scientific events, birth anniversaries of eminent scientists and astronomical events. The



users of this product, comprising teachers, students and individuals, have found it useful for planning events, talks, activities, etc. based on the information provided in it. 2000 copies were printed and widely distributed across the country.

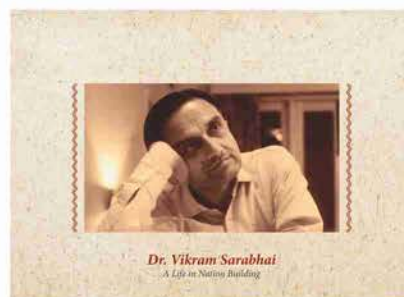
Vigyan Drashti

The Vigyan Drashti is a Gujarati bimonthly science wall-magazine. It is published in four-colour, 8-page newspaper format. It contains articles, activities, experiments, latest information, puzzles, amazing facts, crosswords, science toons, etc. It serves as an effective science learning resource in Gujarati and a large number of schools and individuals subscribed to it. Six volumes were brought out during the year. 2000 sets were printed and sent to subscribers and used as part of programmes.



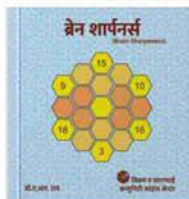
Publication - Dr. Vikram Sarabhai

A book titled 'Dr. Vikram Sarabhai - A Life in Nation Building' was published as a commemorative document on life and works of Dr. Sarabhai. It covered different aspects of his work life and his unique human approach to institution building. The book described the wide range of institutions he helped create. His journey on the path of national building through scientific and technical organizations was presented in the book.



Brain Sharpeners - Hindi Edition

The Hindi version of the popular publication 'Brain Sharpeners' by Prof. A. R. Rao, was developed for national reach. This is a collection of 116 mathematical brain teasers with their hints and solutions.



Sukshmadarshi Sanrachnao

This TLM is the Gujarati language version of 'Microscopic Structures'. It is a set of 52 charts packaged in an attractive and handy box. The aim was to give an insight into the fascinating world of cells and tissues. Each chart contained high quality, coloured and labeled photographs of microorganisms, plant, and animal cells & tissues. The photographs were taken using high-end microscope. A brief description accompanied each photograph. This was targeted at schools for use in microscopy classes.



DIY Optics Models Kit

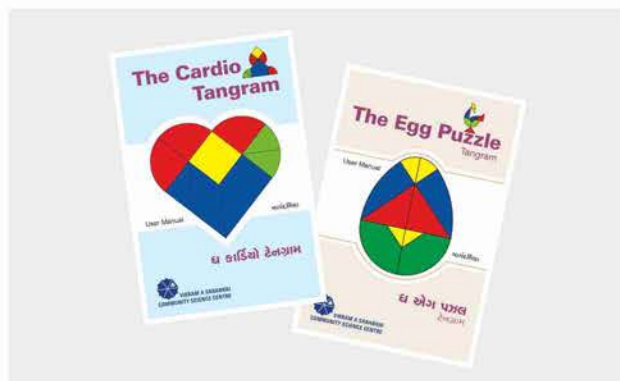
Paper templates of models based on optics (light) were developed which included Pinhole Camera, Lens Camera, Kaleidoscope, Periscope, and 3D Glasses. These 5 models were packaged as a kit. All other material required to prepare the models and user manuals in English and Gujarati, were provided with the kit. This DIY kit was useful for hands-on model-making by children both at individual level or in classrooms. Through this creative activity, the child could explore and learn the science associated with the model. This kit was popular for gifting purpose.



Cardio Tangram & The Egg Puzzle

Tangram is an exciting game which stimulates creativity. It is essentially a dissection of square. VASCS brought out 2 variants of Tangram: (i) The Cardio Tangram and (ii) The Egg Puzzle. In The Cardio Tangram, a heart shape is cut into nine pieces. By rearranging these pieces, many interesting and symmetrical shapes can be created. Using this puzzle, the concepts of radius, diameter, angles in the circle, tangents, secants & area can be discussed. In the Egg Puzzle Tangram, an egg shape has been dissected into ten pieces. On rearranging these pieces more than 50 bird shapes and many other shapes can be created.

Both the puzzles were aimed at age group of Std. 2 & above. A bilingual manual in English and Gujarati, containing the puzzle shapes and solution, was developed. The puzzles are popular for personal use by people of all age groups and for gifting purpose.



Model Rocketry - Student Handbooks

Two Model Rocketry Handbooks were published for students: (i) Single Stage Solid Propellant Model Rockets (ii) Water Booster Model Rockets. The Handbooks were aimed at students of std. 11 & above, especially as supplement to the Model Rocketry activity. The handbooks contain detailed information like different types of model rockets, various parts of the model rocket, how to fabricate, how to launch, experimenting with new designs, and the related scientific principles.

Model Rocket Launchers

Two different Model Rocket Launchers for the following were developed: (i) Single Stage Solid Propellant Model Rocket (ii) Water Booster Model Rocket. These new launchers were cost-effective and sturdy and designed after much development work. The launchers were provided as part of the School Space Club Resource Material so that the schools could continue the activity in future. In addition, these were also made available at the Science Shop.

VASCSC is thankful to the following agencies who were our major funding and project partners for the year 2019-20:



Department of Science & Technology
Government of India



CAF Charities Aid
Foundation
India



vovantis
LABORATORIES

ડો. સુરેશભાઈ ડી. ભટ્ટ
ચેરીટેબલ ટ્રસ્ટ

Schlumberger



Following is a list of institutions, organizations and schools with whom VASCSC collaborated in different capacities:-

- Dept. of Science & Technology (DST), National Council on Science & Technology Communication (NCSTC), Govt. of India, New Delhi
 - National Council of Science Museums (NCSM), Kolkata
 - Oracle
 - Charities Aid Foundation India
 - ISRO
 - IBM India
 - Systronics India
 - Vovantis Laboratories
 - Schlumberger India
 - KHS Machinery, Ahmedabad
 - Vigyan Prasara, New Delhi
 - Dr. Sureshbhai D. Bhatt Charitable Trust
 - Manorama Sheth Fund
 - Bholabhai Jesingbhai Charitable Trust
 - Atul Foundation
 - Ahmedabad Education Society
 - Ahmedabad Municipal Corporation
 - All India Radio
 - DIETs, Gujarat
 - Electrobotics
 - Finar Foundation
 - Gujarat Council of Educational Research & Training (GCERT)
 - Gujarat Ganit Mandal
 - Gujarat Science Academy
 - IITRAM, Ahmedabad
 - Indian Association of Physics Teachers (IAPT)
 - Seva Mandir Training Centre, Udaipur
 - Silver Oaks School, Hyderabad
 - St. Xavier's College, Ahmedabad
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