



SPACE™
EMPOWERING LIFE



ANNUAL REPORT 2022-23

D.A.V. Public School, Velachery

SPACE Astronomy Club

Module 1 - Fun with the Universe &
Public Outreach Events

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PREFACE

D.A.V. Public School, Velachery, has had a solid educational association with SPACE for the last **7** years. The journey of inculcating scientific culture and temperament among young students has been exciting and promising. The active interest and participation have led D.A.V. Public School, Velachery, to stay abreast with the latest in astronomy education and technology. This sets them apart as a group of institutions with a futuristic cum holistic approach toward developing young minds.

It is a matter of pride that besides running the Astronomy and Space Science club successfully, D.A.V. Public School, Velachery, has actively participated in the events, projects, and competitions hosted by SPACE at the national and international level.

ASTRONOMY CLUB IN SCHOOL

D.A.V. Public School, Velachery, has been associated with SPACE India since **2017**. It has been an invigorating experience to serve one of the esteemed schools associated with SPACE.



Mrs. Minoo Aggarwal
Principal

The distinguished and active participation of the school Principal **Mrs. Minoo Aggarwal**, through various endeavors of SPACE has led to a strong. She has been instrumental in promoting the vision of SPACE i.e. spreading scientific temperament among all, especially the young.



Ms. Valli Rajkumar V A
Coordinator

The steady and efficient running of SPACE programs in the school owes it to the club coordinator, **Ms. Valli Rajkumar V A**. She framed a strong backbone for the conduction of all the astronomy activities in the school.

She ensured efficient Coordination and Communication between the School and the SPACE Office.

MESSAGE FROM SPACE FOUNDER FOR STUDENTS



Mr. Sachin Bahmba
CMD, SPACE

Space and Astronomy is the future for the young generation of our Country. This is a great means to inculcate scientific temperament among the masses. Such astronomy sessions will provide a hands on learning platform to students wherein they explore the real world of science. I wish for the young students to let their ambitions soar and think big as they are the future of this country.

SPACE - Pioneer in Astronomy & Space Science

SPACE was formed in 2001 to change the face of science education in India through path-breaking and innovative concepts, services, and programs. The goal has been popularizing and spreading Astronomy and Space Science throughout the Indian masses, especially children.

SPACE introduced the concept of the Astronomy Club in the Indian School Education System. It has been the only organization consistently working with schools and students for over a decade, offering innovative education and making learning enjoyable.

The company reaches out to more than 1,50,000 students annually and serves over 1000 schools, colleges, and universities through its various programs. It is a member of the Confederation of Indian Industry (CII), India's premier business association.

OUR MISSION

To develop and popularize space science & STEM Education In India and establish a global association with national & international space science agencies, societies, amateur, and professional organizations, government agencies, and space observatories.

OUR VISION

To popularize hands-on space science & STEM Education through various fun-filled pioneering concepts, services, and programs.

FOUR FOUNDATION PILLARS OF SPACE

POSSIBILITY



INNOVATION



OPPORTUNITY



COLLABORATION



ASTRONOMY CLUB PREFACE

Introduction

SPACE Astronomy Club is a unique model that popularizes Astronomy and Space Sciences through STEM and multiple intelligence-based curriculum conducted along with events, competitions, trips, projects and classroom interactive sessions organized throughout the academic year.

SPACE Astronomy Club offers two modules under this program, and this year the school students opted for the module 1.

SPACE Astronomy Club Module 1

(FUN WITH THE UNIVERSE)

'Fun with the Universe' is the beginner level program for young Astronomy enthusiasts. The program is based on the basic concepts of Astronomy that affects day to day life, nature and surrounding through hands-on-learning techniques.

MODULE - I

Orientation to SPACE Astronomy Club & Comets and Asteroids: The Space Rocks

Orientation to SPACE Astronomy Club

This session introduced the SPACE Astronomy club to the students and the purpose and conduction of the club was discussed with them. The outreach programs at SPACE were introduced and participation of club members in it was explained.

Following were the outcomes of the session:

- To welcome all students to the new SPACE Astronomy Club and introduce its purpose.
- To introduce Astronomer's Tools – The Module 1 astronomy kit and importance of tools & aids in astronomy.
- To introduce the nomination and selection of crew members of the astronomy club.
- To introduce the highlights and importance of all outreach programs.
- To plan the club event calendar for the year which the club organize and conduct

Comets and Asteroids

The session gave a hands on experience to all the astronomy students to make comet in groups. The students learnt about the importance of these celestial objects and the secrets they hold about the formation of the solar system in this session. At the end of the session, students made their own comets using easily available materials.

Following were the outcomes of the session:

- To understand that a comet holds answer to key questions regarding our origin.
- To understand the parts and structure of the comet.
- To understand the residing place of comets.
- To understand what an asteroid is and what its features are.
- To understand about meteors and meteor showers.



Students learned to make the Comet model



Students enjoyed making their comet



Students enjoyed learning about comets and asteroids



Group photo of students with their comet model

Astronomer's Tools, A grid in the sky, & Creating a Sky Map

Astronomer's Tools

This session gave a first-hand experience to all astronomy club students with their Astronomy kit. Students understood the importance of aids and tools required in astronomy. Also, they got basic understanding of each tool.

Following were the outcomes of the session:

- To make students understand the need of certain tools, aids and equipments in learning astronomy.
- To introduce everyone to the SPACE Astronomy Club kit and all its items.
- To make them realize the use of these items in popularizing astronomy in the community.

A Grid in the Sky: Celestial Coordinate System

This session is all about the celestial coordinate system, its structure, important terms and identification of coordinates of objects in the sky. It talks extensively about the Equatorial coordinate system and its two coordinates, Right Ascension and Declination.

Following were the outcomes of the session:

- To understand the need and advantage of a grid system.
- To understand the shape of our sky as spherical or dome shaped.
- To understand why a grid system is required in spherical shaped sky.
- To learn about the Equatorial Celestial Grid System.

Creating a Sky Map

Students in this session made one complete sky map and this required them to understand celestial globes to find stars with the help of celestial coordinates or find the coordinates of various stars.

Following were the outcomes of the session:

- To learn to use celestial globes to find celestial coordinates of objects.
- To study the sky map and its major features (given in the Astronomy Kit).
- To learn to create sky maps of both celestial hemispheres.



Students learnt about the grid system in the sky and received the tool kit



Students did an activity to learn the importance of grid system



Students did an activity to find the RA-
Dec of the star



Students did an activity to find the
constellations

Astrophotography Level 1: Introduction and Working on DSLR camera

Introduction to DSLR

In this session students were introduced with DSLR Camera and learnt its working and controls. Students learnt about changing various settings on the camera to perform low light photography. Students understood in detail the three major settings in a DSLR Camera: ISO, Aperture, and Shutter speed. Following were the outcomes of the session:

- To understand about meaning and origin of photography.
- To understand DSLR – Digital Single Lens Reflex Camera.
- To understand the settings for low light photography.

Working on DSLR Camera

In this session, students used DSLR camera and performed live photography. Students used the camera in manual mode and judged the best settings to be kept under given conditions. Following were the outcomes of the session:

- To have a hands on experience on DSLR cameras.
- To capture low light photographs in the classroom at various settings.
- To learn fun photography and explore possibilities with DSLR camera with use of accessories.



Students learned operating the DSLR



Students doing the light painting activity

Directions in Daytime: Finding Cardinal Directions & Project Paridhi: Measuring Earth's Circumference

Directions in Daytime: Finding Cardinal Directions

In this session, the Astronomy Club students learnt the importance of direction in day-to-day life. Students realized the difference and importance of common and cardinal directions. Students also discussed various methods of finding directions. Students performed Shortest Shadow Method and find the true geographical directions. Following were the outcomes of the session:

- To make students understand about directions.
- To make students learn about methods of finding directions.
- To learn about finding geographical directions using the shadow of an object cast by the Sun.

Project Paridhi: Measuring Earth's Circumference

In this session Astronomy club students understood Project Paridhi, a flagship project of SPACE in which students learnt the motion of sun in the sky and replicated a 3rd century BC experiment, Eratosthenes Experiment to find the circumference of the Earth using simple backyard tools. Following were the outcomes of the session:

- To make students understand Project Paridhi and its relevance.
- To learn about Eratosthenes experiment.
- To understand the calculation of circumference of the Earth.



Students marking the shadow of the Gnomon rod



Students learned about the Project Paridhi



Students learned about the Eratosthenes experiment



Students replicating the 300 year old experiment

Sun – Our daytime Star and Solar Observation: Safe Viewing Techniques

Sun – Our Daytime Star

In this session, the importance of Sun, its source of energy and special features like sunspots, flares and prominences and many more things were discussed with the students. They were also introduced to safe and unsafe methods of observing Sun.

Following were the outcomes of the session:

- To understand the importance of Sun in our daily life.
- To understand the source of energy of the Sun.
- To understand about differential rotation of the Sun.
- To understand about Sunspot, Coronal Mass Ejection.
- To learn about the special features of the Sun.
- To understand the concept of solar cycle and magnetosphere.
- To learn about satellite related to Sun.
- To understand the importance of solar filter.

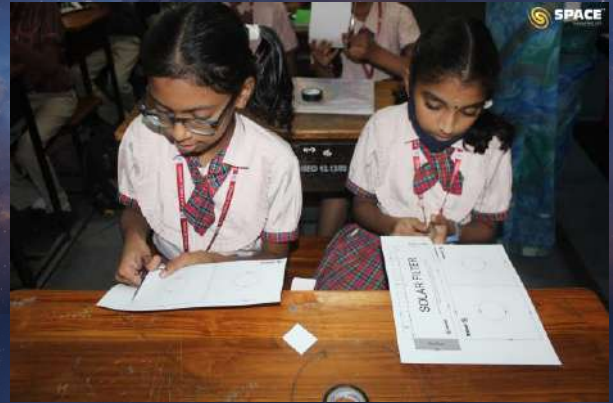
Solar Observation: Safe Viewing techniques

During this session, students observed the sun with safe methods and viewed the solar features. Students observed sunspots through the telescope by various safe methods. Along with this, students learned how to point a telescope towards sun without actually directly looking towards it and pointed their own telescopes towards the sun. Following were the outcomes of the session:

- To know about the unsafe methods of observing Sun.
- To know about direct methods of observing Sun.
- To know about indirect methods of observing Sun.
- To observe Sun using a telescope.



Students learned the formation of Sunspots in the Sun



Students making their own solar filter



Students happy to receive their 50mm telescope



Students observed the sun using 5 different methods

Rocket Science Level 1: Basic of Rocketry, Construction of Hydro-rockets and Launching of Hydro-rockets

Rocket Science Level 1: Basics of Rocketry

Rockets are called space vehicles as they are the only transportation system we have for sending anything into space. They are used for sending satellites and human beings into space. Rocketry is an important part of astronomy, hence students were introduced to basic concepts behind rocketry. Following were the outcomes of the session:

- To understand rocket is a space vehicle.
- To understand the principle of rocketry.
- To understand the parts of rocket and its function.
- To understand about the aerodynamic stability in rockets.

Construction of Hydro-Rockets

Apart from learning about the basic concept of rocketry, students also learnt how to construct a hydro-rocket. Following were the outcomes of the session:

- To demonstrate students how to construct a 600ml hydro-rocket.
- To test the rockets made by the students for a stable flight.

Launching of Hydro-Rockets

After making their own rockets students launched their self-made rockets. They also learnt about the science behind the launching of rockets. Following were the outcomes of the session:

- To analyze a live rocket launch for better understanding of launching.
- To learn about the fuel required in rockets.
- To understand the roles and responsibilities of various team members in a rocket launching.
- To understand the parts of rocket launcher.
- To have practical experience of launching a rocket by themselves.



Students making their hydro rocket



Students enjoyed making their hydro rocket



Students helped each other while making the hydro rocket



Students posing for a group photo with their rocket

Stellarium – A Sky Simulation Software, Understanding the Telescope & Hands on Telescope

Understanding the Telescope & Hands on Telescope

In this session students learnt about telescope, its importance, invention, types, working, and astronomical discoveries. They were also briefed about the difference between reflector and refractor telescope and other telescopes as well. Following were the outcomes of the session:

- To understand the meaning of a telescope.
- To know about the classification of telescopes.
- To learn working of different types of telescope.
- To learn about the different telescope mounts.
- To learn about some important telescopes.
- To know about other types of telescopes (based on electromagnetic spectrum).
- To know about future telescopes.
- To understand the alignment of a 50mm refractor telescope.

Stellarium – A Sky Simulation Software

Apart from above mentioned things, students learnt about a simulation of sky through a software called stellarium. The students had an introductory exposure to astronomy observation by observing the evening sky. Following were the outcomes of the session:

- To learn about telescope handling.
- To learn about terrestrial and celestial observation



Students learned to use their telescope



Students observed various planets and moon using the 8 inch Dobsonian telescope



Students assembling their telescope



Students pointing and observing the moon using their 50mm telescope

Orientation of the Night Sky, Night Sky through Maps, Real Time Night Sky Observation & Observation through a Telescope

In this session, students experienced overnight observation for the first time, which was conducted at NatWest Mago County, Tiruvallur. Students learnt about the night sky, where they also observed some important celestial objects. Following were the outcomes of the session:

- To make students learn and understand about horizon.
- To make students learn the need and importance of dark site for astronomical observation.
- To make students learn the difference dark adaptation makes to the number of stars seen.
- To make students learn and understand the importance of using Dim Red Light torches for observing the maps
- To introduce them with the concept of light pollution.
- To make students learn and understand the sky as a celestial sphere and its importance.
- To make students learn and understand the division of sky into different houses to find stars as well as constellations easily.
- To introduce them to the term Zenith and Nadir.
- Students understood what constellations are.
- To make students learn and understand what is ecliptic, zodiacal belt and why the planets are only visible near the ecliptic.
- To make students learn and understand about the alignment of Planisphere and its importance in finding celestial objects.
- To make students learn and understand to locate (given a name, they can find it in the sky) and identify (shown to them in the sky, they can find out its name) stars, constellations and naked eye planets using a Planisphere.
- To make students learn and experience the photography of celestial objects.
- To make students understand how to select a good frame for photography.
- To provide them a hands-on session of handling telescope where they observed various celestial objects through their 50mm Refractor Telescopes and 8" Dobsonian Reflector Telescope.



Students pointing and observing Saturn from their telescope



Students taking astrophotographs of different constellations using DSLR



Group photo of students under the milkyway arm



Group photo of students along with the coordinators after the overnight session

Astronomy Day Preparation & Astronomy Day

Astronomy Day Preparation

Astronomy day preparation is a session where club students and the educator discuss about how to put up a successful astronomy fair in their school. All students are given a brief about the activities chosen for their astronomy day and they are told about what all is required by them to put up a successful fair to showcase their love for astronomy in front of their school. Students are generally given time of seven working days to prepare for the actual event after this preparation session. Following were the objectives of this session:

- Students recapitulated club sessions that students had learnt.
- Students understood the preparation required to organize astronomy day.
- Students learnt how to host an event for their school.

Astronomy Day

Astronomy day is the culmination of the yearlong SPACE Astronomy Club in the school. Club students who have now become budding astronomers, take up the responsibility to spread astronomy amongst everyone. This one day in the school is dedicated to astronomy and involves everyone in amazing astronomy and space sciences related activities. It gives the club students a platform to showcase their learnings of astronomy to fellow students, teachers, principal, parents and other dignitaries. All students are divided into small groups where each group is assigned a stall in the astronomy fair for their respective activity. Following were the objectives of this session:

- Students showcased their astronomy knowledge.
- Popularization of astronomy among all.
- Students were encouraged to organize and host successful astronomy day in their school.
- Students learnt time management, team spirit, and leadership skills



Principal motivating the students before the Astronomy day Celebration



Students explaining the celestial coordinates using the puzzle



Students demonstrating the 8inch Dobsonian telescope



Students demonstrating the pop rocket to the other students

Participation In Outreach Events



SPACE believes we can connect with the masses using this science and help dispel superstitions. SPACE also uses Astronomy to foster interest in science in students by immersing them in hands-on activities and giving them opportunities in exciting projects.

In our quest to use Astronomy to build a scientifically aware society, we have launched various outreach programs that introduce the wonders of Astronomy to all. Besides providing a larger platform and exposure to astronomy enthusiasts for over a decade, our programs continue to be intriguing and interactive. The programs combine fun with learning.

During this journey with SPACE, the students of D.A.V. Public School, Velachery, got several chances to enhance their skills and show their talent on various platforms. SPACE conducted the following events through which they showcased their talent at National as well as International platform:

- All India Asteroid Search Campaign
- Global Astronomy Month

AIASC (All India Asteroid Search Campaign)



SPACE in association IASC (International Astronomical Search Collaboration) organized AIASC in two phases. SPACE conducts this campaign across India, in association with International Astronomical Search Collaboration (IASC) conducted by Dr. Patrick Miller of Hardin Simmons University, USA as an educational outreach programme.

For 2023, the campaign was divided into 2 phases each lasting a month, for which training workshop was provided by SPACE. Two participants were selected and trained to search asteroids in the Main Belt Asteroid through advanced data analysis and specially designed software.

Students received data from the 'Pan Starrs' (The Panoramic Survey Telescope and Rapid Response System) Telescope, which is located at Hawaii, US and uses a 1.8m (60 inch) telescope to survey the sky to look for asteroids, comets and Near Earth Objects (NEO).

GLOBAL ASTRONOMY MONTH



April Month is celebrated as Global Astronomy Month all over the world. Students participated in various events and activities to celebrate it. All the activities were registered with the International Website of Astronomers without Borders. Students learned astronomy through various activities.

SPACE proposed a bouquet of GAM and general astronomy programmes to associated schools. Students participated in the majority of events like Astro Art and Astro Poetry Competition under Global Astronomy Month 2023. SPACE. Parth Reyya and Sudhavarshini H won second and third place in Astro Art Competition. In the Astro poetry competition, three students secured first and third places in two different categories. They are - Advait Sreekanth, Ritesh Mannem, and Saranya S.

Started in SPACE schools in 2012, in the last few years, SPACE schools have been appreciated for their high level of participation and posting on social media.