संस्कृति मंत्रालय
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Ministry of Culture
Government of India

नेहरु विज्ञान केन्द्र
राष्ट्रीय विज्ञान संग्रहालय परिषद् की इकाई
संस्कृति मंत्रालय, भारत सरकार
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नेहरु विज्ञान केन्द्र
राष्ट्रीय विज्ञान संग्रहालय परिषद् की इकाई, संस्कृति मंत्रालय, भारत सरकार
डा. ई. मोसेस रोड, वर्ली, मुंबई–400 018 (022) 3105 9020, 3105 9021
edu.nscm@gmail.com https://nehrusciencecentre.gov.in

CONTENT

DIRECTOR'S DESK

Hello Members,

Greetings from Nehru Science Centre Mumbai!

The financial year and the academic year 2024-25 are on the verge of closing now. We are pretty confident that these have been good enough for you all so as to get through these with flying colours with success on your side. Soon you will be observing summer vacation and obviously the quality time and also the creative time. Now is the time to plan for them.

Nehru Science Centre Mumbai has already announced a number of creative science workshops onsite as well as a few online for those who can't come physically owing to the distances. These workshops will expose the young budding scientists to STEM education through hands-on workshops in diversified fields like Robotics, Drone making and flying, IoT, AI, Electronics, basic sciences, Rocketry, aeromodelling, 3D printing, for students of 3rd to 12th standards. The interaction during the workshops will expose students to real world problem and help them to think about the innovative solutions to these problems. The workshops will be able to provide multidisciplinary skills to the participants which is basic of STEM education. I am sure each one who is interested in hands-on workshops will find something for sure. Plan it right now as soon registration will start.

You are also aware that Government is focussing on agenda 2070 and has announced special missions on clean energy, nuclear mission. There is focus on quantum mission and AI also which are future of technologies. Nehru Science Centre has opened a completely refurbished Hall of Nuclear Power (Version 2.0) with updated information and some latest interactive exhibits. The hall has been developed with the support of Nuclear Power Corporation of India Limited (NPCIL).

The Science Centre in collaboration with GET SET Learn (GSL) - an education wing of Arvind Mafatlal Group has also set a temporary exhibition on Dinosaurs among us which basically describes about the evolution of birds from dinosaurs. The exhibition is based on AMNH research on the content and is quite interesting to learn through guided tour and hands-on activities like be an archaeologist, assembling a dinosaur, storytelling etc.

We collaborated with Marshal Company to organise successfully the 4th CIIA (Creative Ideas and Innovations in Action) in which best 100 innovative projects were on display for 3 days. We also observed National Science Day with support from Rajiv Gandhi Science & Technology Commission, Govt. of Maharashtra and NCSTC, DST New Delhi.

I really thank the team members of Nehru Science Centre, our collaborators, supporters and our active audience & participants for organising several extension educational programmes flawlessly.

Keep watching, stay in touch for more events and opportunities.

Umesh Kumar Rustagi
Director, NSCM

EXHIBIT AT THE CENTRE

Rutherford's Gold-Foil Experiment: Unveiling the Atomic Structure

Rutherford's Gold-Foil Experiment: Unveiling the Atomic Structure

This interactive exhibit, now part of the newly renovated 'Hall of Nuclear Power' gallery at the Nehru Science Centre, offers a hands-on experience of Rutherford's experiment..

"**Rutherford's pioneering gold-foil experiment**" revolutionized our understanding of atomic structure. By directing positively charged alpha particles (helium nuclei) at a thin gold foil, Rutherford observed that most particles passed through, revealing that atoms are primarily empty space. However, some particles deflected slightly, and a few bounced back, indicating the presence of a dense, positively charged core — the nucleus. This led to the planetary model of the atom, where electrons orbit the nucleus at high speed.

Ernest Rutherford, primarily a physicist, won the 1908 Nobel Prize in Chemistry for his groundbreaking work on radioactive decay and element transmutation. Overnight, the "father of nuclear physics" became a chemist!

What's New?

A Breakthrough in Sustainable Plastics

Japan develops plastic that dissolves in the sea within hours and improves soil health.

Plastic is an essential part of modern life, but its persistence in the environment has led to a global crisis. Microplastics and other pollutants threaten ecosystems, with conventional plastics taking centuries to break down. However, a groundbreaking innovation from Japan offers new hope.

A research team led by Takuzo Aida, Group Director at RIKEN and Distinguished Professor at the University of Tokyo, has developed a revolutionary plastic that dissolves in seawater within hours. Unlike traditional plastics, which remain in the environment for decades, this new material breaks down into reusable monomers that bacteria can further degrade. These monomers, rich in nitrogen and phosphorus, can even serve as fertilizers, enhancing soil health.

Published in Science on November 22, 2024, the research reveals that this eco-friendly plastic maintains conventional plastics' strength and process ability. It can also be coated with an environmentally safe water-repellent film to extend its durability in marine environments. Moreover, in soil, it fully decomposes within ten days, offering a sustainable alternative that leaves no harmful micro plastics behind.

Source: https://featured.japanforward.com/japan2earth/2025/03/9158/

WORD PUZZLE !

Forest Treasures: Wild Animal Quest

Are you able to find 10 wild animals hidden here?

H	J	Z	H	J	H	G	I	R	A	F	F	E	B	H
H	G	E	F	T	Y	F	E	H	D	F	G	H	T	B
G	H	B	Q	D	L	I	O	N	V	B	N	E	H	E
K	L	R	I	U	Y	T	G	J	V	P	V	L	M	A
A	S	A	D	F	D	B	N	H	J	A	F	E	D	R
B	N	M	J	K	H	G	Y	U	J	N	F	P	J	G
R	D	F	T	I	G	E	R	C	V	D	V	H	H	J
H	B	N	M	J	Y	U	T	G	J	A	G	A	J	G
I	F	G	H	T	H	F	J	V	H	Z	X	N	B	N
N	Y	K	A	N	G	A	R	O	O	M	K	T	K	L
O	I	O	P	U	Y	T	G	J	B	V	C	N	H	F
G	T	R	E	D	S	F	H	K	O	A	L	A	N	M

Send your answers to librarian.nscm@gmail.com

CONGRATULATIONS!!

Congratulations to all the winners of our Math Puzzle contest featured in Sci-Mail Vol 28 No.1 We received an overwhelming response from hundreds of brilliant students, and we are thrilled to announce the top three winners who impressed us by submitting the correct answers within the first week of publication.

- **Preetisha Jenica Patil, 7th Std.**
  CNM School, Vile Parle West, Mumbai
- **Samiya Guptarishi, 6th Std.**
  Smt. Sulochanadevi Singhania School, Thane
- **Akanksha S. Chougule**
  Central Primary School, Sonurle
  Tal - Shahu Wadi, Kolhapur

Last date for Sending Answers : 30th April 2025
Best entry will be suitably awarded too.

Note : The contest is open to students up to std. X only

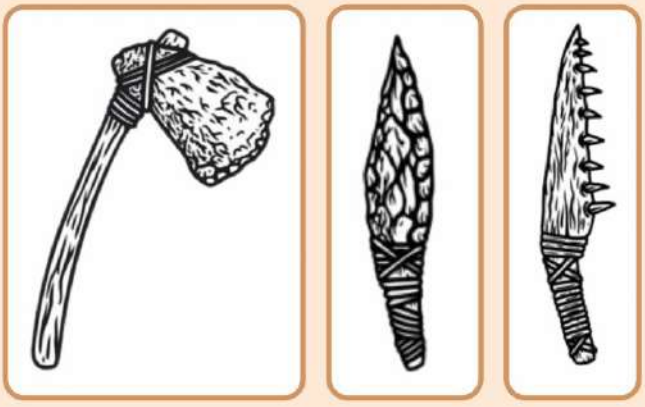
Stone Age Tools of Ancient India

Long before the age of metal and fire, when the world was shaped by hands rather than machines, early humans in India crafted tools from stone. These tools, simple yet ingenious, became their means of survival—shaping their journey through millennia. Today, these tools whisper to us from the past, reminding us of the journey that began with a simple stone and led to the vast wonders of modern India.

The Evolution of Stone Tools

The earliest evidence of tool usage in India dates back to the Paleolithic Age. During this period, early humans began crafting small flake tools from diverse materials such as agate, chalcedony, chert, carnelian, jasper, obsidian, and quartz. These tools were often attached to wooden handles and used for cutting, demonstrating remarkable ingenuity.

Among the most commonly used Stone Age tools were hand axes. Made from pebbles of suitable size, these were created by chipping away large flakes from both upper and lower surfaces, particularly at the narrow end. Held directly in the hand, they earned the name "hand-axes." Simpler pebble tools, when worked further, evolved into chopper tools, which were seen throughout Southeast Asia. Another essential tool of the era was the cleaver—a flat, axe-like tool with a broad cutting edge, formed by the intersection of two flaked surfaces. Unlike hand axes, cleavers were generally crafted from flakes rather than pebbles.



Techniques of Tool Making

The crafting of stone tools involved three primary techniques:

Shaping Tools:

Refining the stone to achieve the desired form.

Detaching Flakes & Blades:

Removing flakes to create sharp edges.

Modifying the Edge or Tip:

Enhancing the tool's functionality.

In the later stages, the percussion technique was developed, where stones were used as hammers to refine tools. This marked an important advancement in tool-making technology.

The Art of Flaking

Artificial chipping of stones to produce specific tools is known as 'flaking.' Throughout the Stone Age, various flaking techniques were employed to develop tools, evolving from crude to refined designs. Archaeological findings provide invaluable insights into these methods, illustrating the transition from primitive tools to sophisticated microliths, grinding tools, and axes.

In India, numerous archaeological sites have yielded evidence of such early tools, shedding light on the resourcefulness and adaptability of ancient humans. These artifacts serve as a testament to the ingenuity of our ancestors and their role in shaping the course of human civilization.

Explore India's Stone Age heritage at our Science Centre's Technology & Heritage gallery. The Stone Age Tools exhibit showcases a variety of tools from the era and the techniques used to create them.

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INDIAN SCIENTIST

Dr. Homi J. Bhabha: The Father of India's Nuclear Programme

Homi Jahangir Bhabha (1909–1966) played a key role in India's scientific and technological growth after independence. Born in Mumbai, he studied engineering at Cambridge but soon followed his passion for physics, earning a Ph.D. in nuclear physics in 1934.

After returning to India, Bhabha joined the Indian Institute of Science and founded the Cosmic Ray Research Institute. In 1945, he established the Tata Institute of Fundamental Research (TIFR), which became the foundation for India's nuclear program. Recognizing the importance of atomic energy, Bhabha convinced Prime Minister Nehru that it would be essential for India's industrial future.

In 1954, he set up the nuclear research centre at Trombay, later renamed the Bhabha Atomic Research Centre (BARC). He also organized the first UN Conference on the Peaceful Uses of Atomic Energy in 1955.

Bhabha received many honours, including the Padma Bhushan and membership in the Royal Society. Sadly, he died in a plane crash on January 24, 1966, but his contributions left a lasting impact on Indian science and innovation.

To explore more about the inspiring life and legacy of Dr. Homi Jahangir Bhabha, visit our exhibition, "Dr. Homi Jahangir Bhabha – A Visionary and Guiding Light," now featured at the newly renovated 'Hall of Nuclear Power Gallery' at the Centre.

BOOK WORTH READING IN NSC LIBRARY

ISRO: Exploring New Frontiers
(Curated by T S Subramanian)

ISRO: Exploring New Frontiers – To the Moon, The Sun & Beyond is an inspiring chronicle of India's incredible space journey, offering readers a front-row seat to the nation's pioneering missions. Published by The Hindu Newspaper Group, this visually stunning and well-researched book perfectly blends history, technology, and ambition, making it an essential read for students, space enthusiasts, and the general public.

With over 500 captivating images and an engaging narrative, the book highlights ISRO's monumental achievements—Chandrayaan, Mars Orbiter, Aditya-L1, and the ambitious Gaganyaan mission. It also looks ahead to exciting future projects, including a space station and a mission to Venus. Exclusive interviews with ISRO Chairman S. Somanath and insights from visionaries like Dr. A.P.J. Abdul Kalam add depth and inspiration to the book.

For students, this book is more than just a record of past accomplishments—it teaches perseverance, innovation, and self-reliance. It ignites curiosity and encourages young minds to dream beyond boundaries. Whether you are fascinated by space or simply want to learn about India's technological strides, ISRO: Exploring New Frontiers is a must-read, celebrating India's relentless pursuit of the stars.

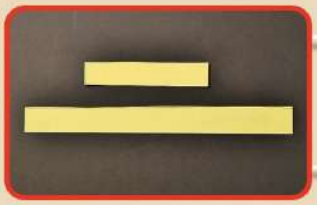
Creativity

Make Your Own Hoop Glider!

You will need

Drinking straw, 2 strips of cardstock (1 long: 10" x 1" and 1 short: 5" x 1") Ruler, Scissors & Tape.

Steps to Make It:



Cut the Strips : Cut one strip that is 10 inches long and another that is 5 inches long.

Make the Hoops : Curl each strip into a circle and tape the ends to form two hoops.

Attach the Hoops: Tape the small hoop to one end of the straw. Tape the big hoop to the other end, making sure both hoops are lined up.

Fly Your Glider : Hold the straw in the middle, gently toss it, and watch it glide!

How Does It Work?

Birds, insects, and bats all have different wing shapes that help them fly in unique ways. Your hoop glider works on a similar principle!
When you throw the glider: Air moves faster inside the hoops, creating a low-pressure zone.
Higher pressure outside pushes toward the low-pressure zone, giving your glider the lift it needs to fly through the air!
Try adjusting the hoops to see how it changes your glider's flight!

TREE TREASURE AT NSC

Saptaparni: The Devil's Tree
Botanical Name: Alstonia scholaris
Family: Apocynaceae

Saptaparni, commonly known as the Devil's Tree, is a medium-sized evergreen tree that holds a wealth of fascinating qualities. Its name originates from Sanskrit, where 'sapta' means seven and 'parni' means leaves — a nod to the arrangement of its leaves, which are usually found in clusters of seven around the stem. These glossy, blunt leaves create mesmerizing star-like symmetries and remain vibrant throughout the year, with new foliage emerging in March-April and again during the rainy season.

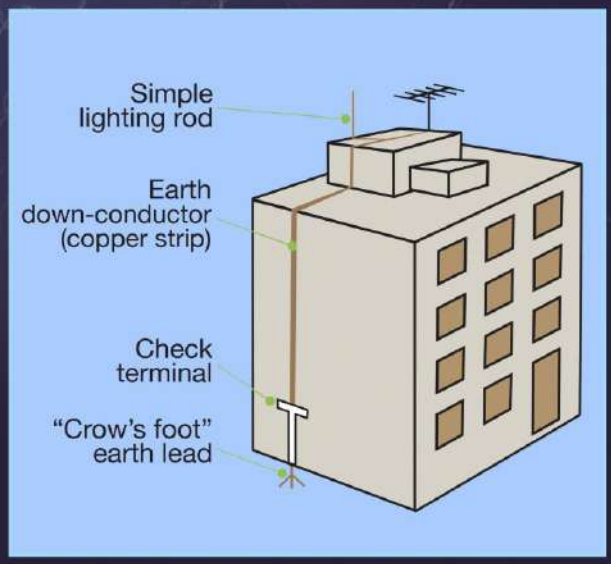
This tree goes by many names, including Shaitan ka Jhad (Devil's Tree), but its scientific name, Alstonia scholaris, highlights its true significance. The genus is named after Professor C. Alston, a renowned botanist from Edinburgh, while "scholaris" refers to its historical connection with education. The bark of the tree was traditionally used to make blackboards, writing slates, and school tables, earning it the nickname "Blackboard Tree.

Saptaparni is a resilient tree often chosen as an avenue tree due to its ability to withstand pollution and adapt to urban environments. Beyond its environmental benefits, the tree holds immense medicinal value. Its bark, known as dita bark, has been used in traditional Indian medicine to treat ailments like diarrhea, dysentery, asthma, and even certain fevers. Interestingly, it has also been used as an aphrodisiac in ancient practices.

During its flowering season, Saptaparni becomes a hub of activity, attracting a variety of insects such as butterflies, bees, and beetles. These insects play a crucial role in pollination, while the large branches of the tree provide an ideal breeding ground for wild bees to build their hives. The seeds, adorned with silky tufts on both ends, are dispersed far and wide by the wind, ensuring the tree's continued presence.

How Things work

Lightning Arrester



A lightning arrester is a critical device used to protect buildings, electrical equipment, and power systems from the destructive effects of lightning strikes. Installed at strategic points, including on the rooftops of buildings, it safeguards structures and electrical networks by channeling high-voltage surges safely into the ground.

The arrester consists of components such as spark gaps or non-linear resistors made of materials like zinc oxide or silicon carbide. These components remain non-conductive under normal conditions, allowing regular electrical operations to continue. However, during a lightning strike, the arrester rapidly becomes conductive, directing an immense surge of electricity away from the building and electrical system.

On buildings, the lightning arrester is typically placed at the highest point, such as the rooftop or antenna, since lightning naturally strikes elevated objects. It is connected to a grounding system through a down conductor. This grounding system provides a low-resistance path, ensuring the surge energy safely dissipates into the earth, protecting both the structure and its occupants.

Once the surge has passed, the arrester quickly resets to its non-conductive state, ready to protect against future strikes. By installing lightning arresters on buildings, risks of fire, structural damage, and harm to electronic equipment are significantly minimized.

DID YOU KNOW

How Ozonization Weakens Tyres

Composed primarily of natural and synthetic rubber, tyres are essential for vehicle performance and safety. The two main synthetic rubbers used in tire manufacturing are butadiene rubber and styrene-butadiene rubber, both of which contain double bonds that provide elasticity and durability. However, these double bonds make tyres vulnerable to degradation over time, leading to cracking.

One major factor contributing to tyre cracking is ozonolysis, a chemical reaction triggered by ozone in the atmosphere. Ozone breaks the double bonds in rubber polymers, weakening the tyre structure and causing cracks to form on the surface. Even minimal ozone exposure can initiate this process, compromising the tyre's integrity.

Additionally, extreme temperatures play a critical role in tire cracking. Prolonged exposure to cold weather makes rubber brittle, while repeated cycles of contraction and expansion due to fluctuating temperatures accelerate crack formation. This is particularly concerning in regions with harsh winters.

Understanding these chemical processes helps scientists develop more resilient rubber polymers and innovative manufacturing techniques. By enhancing resistance to ozonolysis and mitigating temperature-induced brittleness, tyre manufacturers can create longer-lasting, safer, and more durable tyres, ensuring improved performance and safety for consumers.

Chemistry of Radish Aroma

Radishes, known for their crisp texture and peppery flavour, are a popular addition to salads and dishes. However, they often come with an undesirable side effect — bad breath. This is due to the presence of sulfur-containing compounds such as thiocyanates and isothiocyanates, which contribute to their characteristic aroma and taste. Among these, methyl mercaptan is the primary culprit behind the strong odour associated with radishes.

Methyl mercaptan is produced when sulfur compounds in radishes are broken down by enzymes in the mouth. This compound, which is also found in garlic, onions, and cruciferous vegetables like broccoli and cauliflower, has a distinct odor often likened to rotten cabbage or garlic. Although harmless, the smell can be unpleasant, making social interactions uncomfortable.

To combat this odour, simple remedies can help. Chewing gum, drinking water, or using mouthwash stimulates saliva production, which helps wash away food particles and bacteria, reducing the presence of methyl mercaptan. These steps can freshen your breath and neutralize the lingering smell.

Understanding the science behind radish aroma not only enhances appreciation for this nutritious vegetable but also empowers individuals to enjoy it without worrying about its pungent aftereffects.

POPULAR SCIENCE

Article by invitation

Insectivorous Plants

(Dr.) Rita Singh Majumdar
Professor (Retired)
Head Department of Biotechnology
School of Engineering & Technology
Sharda University Greater Noida, UP.
Email: majumdar.rita@gmail.com

Praveen Yadav
Assistant Professor,
Department of Biotechnology,
SSBT, Sharda University,
Greater Noida, India-201306

Have you ever heard of Insectivorous plants or simply insect eating plants? Yes, there are certain plants which have the capability to trap small insects for their nutrition. Today here we shall give a brief description about these peculiar types of plants.

In India we have these types of insectivorous plants in some of ours states mainly like Garo, Khasi, and Jaintia hills of Meghalaya where we still can find varieties of insectivorous plants. There are approximately 500 types of insectivorous plants known in the world. But their types differ depending on the climate of the place or nature of soil. Due to different habitat condition and in different environments such as hot, cold, and humid, as well as under water, these plants appear in different morphological forms with their specially modified any parts of their body with various appearances. The insects that are trapped by these plants die somewhere of these modified structure, and recycled nutrients from their bodies which are generally available for uptake by plants.

Nepenthes rajah is the largest, giant pitcher plant (carnivorous) in the world which is endemic to Borneo- a large island in South East Asia. Its urn-shaped traps grow up to 41 centimetres tall with a pitcher capable of holding 3.5 litres of water.

Insectivorous plants are "insect eating plants". Not only that –there are other types of Insectivorous plants which are also known as carnivorous plants. Surprisingly, these plants also obtain most of their nutrients by trapping and digesting various types of small invertebrates, but occasionally also small frogs and mammals also.

But why they trap these small living creatures?

It is just for their growth and nutrition. As we know that green plants do photosynthesis which is a biological process that converts light energy from the sun into chemical energy for their nutrition, similarly these insectivorous plants for their nutrition need small animals like frogs or protozoan like insects. Sometimes they consume arthropods, small mammals, birds, etc. The tactic of deriving their nutrients is very interesting. For these purpose they develop some special exudates or often modify their leaves and develop different techniques which are their uniqueness. These plants are generally very colourful and because of their highly colourful flowers they can attract the insects. Other than this attractive floral colour, they also produce some juice or sap which also help them in catching insects. Interestingly, these plants can also photosynthesize and still generate all of their energy from photosynthesis.

These types of insectivorous plants mostly grow in humid areas where there are plenty of sunlight and moisture. Nitrogen is the nutrients that are required by all plants in high

amounts. Insectivorous or carnivorous plants also grow well in nitrogen deficient soil in humid areas with lot of sunlight and moisture. They need and grow best in bright, indirect sunlight. The best temperature required is 70-80°F (21–27°C) during the day and slightly cooler at night. Most of the Insectivorous plants thrive best in high humidity level.

Flowers of these plants always grow on tall stalks away from their trapping mechanism to protect pollinators from becoming prey. Common examples of insectivorous plants are Venus flytrap, pitcher plant, bladderwort, etc. Let us discuss some of these plants trapping mechanism which are common in India.

Trapping Mechanism:

Pitfall Traps: These plants develop leaves which are folded into deep, slippery pools filled with digestive enzymes. These we can find in Pitcher Plants.

Flypaper or sticky or adhesive traps: In Sundews and Butterwort plants, leaves are covered in stalked glands that exude sticky mucilage.

Snap traps *(or steel traps):* These plants develop hinged leaves that snap shut when trigger hairs are touched. These are the features that are found in Venus flytrap and waterwheel plant.

Suction traps: These are unique to bladderworts, which are highly modified leaves in the shape of a bladder with a hinged door lined with trigger hairs.

Lobster-pot traps: These are twisted tubular channels lined with hairs and glands and are common in corkscrew plants

Carnivorous plants are having these fascinating features because when they are not trapping insects, even then their unusual forms arouse the curiosity or interest to their captives or insects. Carnivorous plants derive some or most of their nutrients from trapping and consuming animals or protozoans, typically insects and other arthropods, and occasionally their energy from photosynthesis. They have adapted to grow in waterlogged sunny places where the soil is thin or poor in nutrients, especially nitrogen, such as acidic bogs. They can be found on all continents except Antarctica, as well as many Pacific islands. In 1875, Charles Darwin published Insectivorous Plants, the first treatise to recognize the significance of carnivores in plants.

However, you should remember that one should not collect these plants in the wild condition because most of them are relatively rare and one should not destroy their normal habitat condition as well as over collection- these two bad practices would be the greatest conservation threats to carnivorous plants. But one can purchase the plants from a reputable grower who uses tissue culture or vegetative means to grow the plant, or starts them from seeds. The Agri Horticultural Society of India which was founded in 1820 by William Carey on the Alipore Road, Kolkata has a flower garden, greenhouses, research laboratory, etc where they have a significant collection of botanical varieties, including insectivorous plants.

Some Common Indian Insectivorous Plants

Here we shall briefly talk about some insectivorous plants that are found in India. Kamble et al in 2012 stated that India is the home of all five insectivorous genera, namely Nepenthes (commonly known as tropical pitcher plant), Drosera (commonly known as sundew), Utricularia (commonly known as bladderwort), Aldrovanda (commonly known as waterwheel plant), and Pinguicula (commonly known as butterwort) with a total of 21 species. Below is given a brief about some popular insectivorous plants types one by one.

Nepenthes

Nepenthes or Pitcher plants are carnivorous plants known as pitfall traps. It develops a prey - trapping mechanism by forming a deep cavity filled with digestive liquid. Actually the leaves of these plants are modified in to a pitcher like structure. The plants attract its prey and drown the prey with their nectar. The slender pitcher plant named Nepenthes gracilis belongs to family Nepenthaceae which consists of a single genus, Nepenthes, with some 140 species of tropical pitcher plants. These are native to Madagascar, Southeast Asia, and Australia.

Drosera

Drosera brevifolia is a dwarf, small or called red sundew, is a carnivorous plant of the family Droseraceae and is the smallest sundew species native to the United States. They are also known as sundews as the plants have tentacles on their leaves that secrete a sticky fluid looking like dew. The insects are attracted by their

glistering fluid that traps these insects. Since the tentacles on the leaves secrete this sticky fluid that shines in the sun like dew-drops, the Drosera plants are commonly known as sundews. When an insect lured by these glistening drops alights on the leaf surface it gets stuck in this fluid and are absorbed and digested. Their mode of nutrition is heterotrophic nutrition. These plants are either Parasite which means it lives on or in another organism called its host and get its nutrition from it or Saprophyte means a plant, fungus or microorganisms that lives on dead or decaying organic matter or Insectivorous, etc . The insectivorous plants are the type of carnivorous plants. They derive their nutrition by eating insects, arthropods or other animals.

Urticulaia

Urticulaia is rootless aquatic plant and is the largest genus of carnivorous plants. It is one of the three genera that make up the Bladderwort family Lentibulariaceae, along with the butterworts , example like Pinguicula and corkscrew plants like Genlisea. The bladderwort genus contains 220 widely distributed species of plants characterized by small hollow sacs that actively capture

and digest tiny animals such as insect larvae, aquatic worms, and water fleas. These plants do not have any clear , differentiated roots. The dried leaves are used to make a medicinal tea. The bladderwort plants are good for treating urinary tract disorders and also for kidney stones and urinary tract infections (UTI). They also take it to treat spasms, fluid retention, and swelling; to stimulate gallbladder secretions; and to promote weight loss. When carnivorous plants eat animals, they actually gain the nitrogen that these animals have eaten. Instead of getting important nutrients from the soil, carnivorous plants get their nutrients directly from animals, which are usually small bugs. Carnivorous plants grow in many ecosystems all over the world.

Aldrovanda

Aldrovanda vesiculosa, commonly known as the waterwheel plant, is the sole extant species in the flowering plant of genus Aldrovanda of the family Droseraceae. The plant is rootless, aquatic plant which can captures small aquatic invertebrates using traps similar to those of the Venus flytrap. The traps are arranged in whorls around a central, free-floating stem, giving rise to the common name. This is one of the few plant species capable of rapid movement. Seedlings develop a short proto root; however, this fails to develop further and senesces (process of deterioration with age). The plant consists of floating stems reaching a length of 6–40 cm. The actual traps consist of two lobes which fold together to form a snap-trap similar to that of the Venus flytrap, except that it is smaller and located underwater. These traps are twisted and their openings point shows outward and are lined on the inside by a fine coating of trigger hairs, snapping shut in response to contact with aquatic invertebrates and trapping them.

Pinguicula

Pinguicula, commonly known as butterworts, is a genus of carnivorous flowering plants in the family Lentibulariaceae. The common butterwort also called bog violet or marsh violet can be found in damp areas such as bogs, fens, wet heaths and rock crevices. Due to its low-nutrient habitat, the common butterwort has evolved into a carnivorous plant that supplements its diet

with insects. It has rosette of yellow-green and sticky leaves that appear flat to the ground and take a shape like a star. It produces around two or three upright flower stalks which bear small, deep purple flowers. The plant Pinguicula vulgaris is a small, herbaceous, insectivorous

glistering fluid that traps these insects. Since the tentacles on the leaves secrete this sticky fluid that shines in the sun like dew-drops, the Drosera plants are commonly known as sundews. When an insect lured by these glistening drops alights on the leaf surface it gets stuck in this fluid and are absorbed and digested. Their mode of nutrition is heterotrophic nutrition. These plants are either Parasite which means it lives on or in another organism called its host and get its nutrition from it or Saprophyte means a plant, fungus or microorganisms that lives on dead or decaying organic matter or Insectivorous, etc . The insectivorous plants are the type of carnivorous plants. They derive their nutrition by eating insects, arthropods or other animals.

Urticulaia

Urticulaia is rootless aquatic plant and is the largest genus of carnivorous plants. It is one of the three genera that make up the Bladderwort family Lentibulariaceae, along with the butterworts , example like Pinguicula and corkscrew plants like Genlisea. The bladderwort genus contains 220 widely distributed species of plants characterized by small hollow sacs that actively capture

and digest tiny animals such as insect larvae, aquatic worms, and water fleas. These plants do not have any clear , differentiated roots. The dried leaves are used to make a medicinal tea. The bladderwort plants are good for treating urinary tract disorders and also for kidney stones and urinary tract infections (UTI). They also take it to treat spasms, fluid retention, and swelling; to stimulate gallbladder secretions; and to promote weight loss. When carnivorous plants eat animals, they actually gain the nitrogen that these animals have eaten. Instead of getting important nutrients from the soil, carnivorous plants get their nutrients directly from animals, which are usually small bugs. Carnivorous plants grow in many ecosystems all over the world.

Aldrovanda

Aldrovanda vesiculosa, commonly known as the waterwheel plant, is the sole extant species in the flowering plant of genus Aldrovanda of the family Droseraceae. The plant is rootless, aquatic plant which can captures small aquatic invertebrates using traps similar to those of the Venus flytrap. The traps are arranged in whorls around a central, free-floating stem, giving rise to the common name. This is one of the few plant species capable of rapid movement. Seedlings develop a short proto root; however, this fails to develop further and senesces (process of deterioration with age). The plant consists of floating stems reaching a length of 6–40 cm. The actual traps consist of two lobes which fold together to form a snap-trap similar to that of the Venus flytrap, except that it is smaller and located underwater. These traps are twisted and their openings point shows outward and are lined on the inside by a fine coating of trigger hairs, snapping shut in response to contact with aquatic invertebrates and trapping them.

Pinguicula

Pinguicula, commonly known as butterworts, is a genus of carnivorous flowering plants in the family Lentibulariaceae. The common butterwort also called bog violet or marsh violet can be found in damp areas such as bogs, fens, wet heaths and rock crevices. Due to its low-nutrient habitat, the common butterwort has evolved into a carnivorous plant that supplements its diet with insects. It has rosette of yellow-green and sticky leaves that appear flat to the ground and take a shape like a star. It

produces around two or three upright flower stalks which bear small, deep purple flowers. The plant Pinguicula vulgaris is a small, herbaceous, insectivorous perennial plant with rosette of 3-6 distinctly yellowish green leaves having blunt, oblong- ovate to elliptic leaves, which narrow to the base. Plant can be used medicinally as a cough remedy. The leaves are antispasmodic and antitussive or cough suppressant. Used externally as a poultice, it has a healing effect on the skin. This carnivorous plant, known for its sticky leaves that trap

IN THE LAST QUARTER... JAN 2025

Overnight Sky Observation Program:

Nehru Science Centre, Mumbai, in collaboration with the Extra Mural Department of the University of Mumbai, hosted an Overnight Sky Observation Program at Malti Agro Farm, Gholvad, on January 4-5, 2025. The event saw an enthusiastic participation of 97 astronomy enthusiasts.

The session kicked off with sunspot observations, followed by an immersive night of stargazing. Participants viewed Venus, Saturn, Mars, and Jupiter through telescopes and explored deep-sky marvels like the Andromeda Galaxy, the Orion Nebula, and the Pleiades Cluster. They also learned to navigate the night sky using celestial markers and observed stunning double stars like Sirius, Castor, and Mizar.

The event offered a mesmerizing blend of learning and exploration, leaving participants inspired by the wonders of the universe.

Career Guidance Session for Nursing Students:

Ekam Foundation, Mumbai, in collaboration with Chaitanyam and Nehru Science Centre, organized a two-day career guidance session on January 11 & 12 for underprivileged nursing students across Maharashtra. The event brought together 238 students from 20 colleges, providing them with insights from eight distinguished speakers.

The sessions featured engaging discussions, interactive games, role-playing, and Q&A segments, ensuring an immersive learning experience. A special highlight was the Liquid Nitrogen session, adding a unique scientific perspective. This initiative empowered students with knowledge, skills, and inspiration for their future careers.

Sci-Birthday Celebrations:

Two exciting Sci-Birthday celebrations took place on January 12 and 19, 2025, hosting 50 and 30 participants respectively. Young science enthusiasts engaged in hands-on experiments, captivating science demonstrations, a Science on a Sphere show, and an interactive gallery visit. The events ignited curiosity and made learning science a fun-filled experience.

Observation of Planetary Alignment at NSC, Mumbai:

Nehru Science Centre, Mumbai, hosted a spectacular planetary observation event on January 25, 2025, in both online and offline modes. Around 175 enthusiasts attended in person, witnessing Mars, Jupiter, Saturn, Venus, and Neptune through telescopes, along with celestial wonders like the Orion Nebula and the Pleiades cluster. The event was also streamed live on Facebook, drawing an impressive 15K viewers who enjoyed the rare planetary alignment from the comfort of their homes.

Celebration of the 76th Republic Day:

The Centre proudly celebrated the 76th Republic Day on January 26, 2025, with great enthusiasm. The event commenced with the ceremonial flag unfurling by the Director of NSCM, symbolizing the spirit of democracy. This was followed by an inspiring march past featuring 162 students from the Bodhi Satva Foundation alongside NSC Mumbai staff. The celebration echoed the values of unity and patriotism, making the occasion truly memorable.

MSE Bus - Curriculum-Based:

The Curriculum-Based MSE Bus is actively reaching communities across Ahmednagar, Maharashtra. This month, the bus is covering 15 sites, delivering essential educational resources and support directly to students. By bringing learning opportunities closer to home, the initiative continues to bridge educational gaps and empower local communities.

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Popular Science Lecture:

On January 21, 2025, a captivating Popular Science Lecture titled Antarctica – A Natural Lab to Study Climate Change was delivered by Dr. M. R. Ramesh Kumar, Chief Scientist (Retd.), Physical Oceanography Division, National Institute of Oceanography, Goa. Dr. Kumar provided deep insights into Antarctica's role as a critical observatory for climate studies. The session saw enthusiastic participation from 196 students, who engaged actively in discussions, broadening their understanding of environmental science and climate dynamics.

Upcoming PROGRAMMES

Vacation Creative Science Workshops
April - June 2025

World Autism Awareness Day
April 2, 2025

Experimental Skill Test
April 27, May 18 2025

World Earth Day
April 22, 2025

National Technology Day
May 11, 2025

International Museum Day
May 18, 2025

No Tobacco Day
May 31, 2025

World Environment Day
June 5, 2025

International Biotechnology Day
June 16, 2025

IN THE LAST QUARTER...

FEB 2025

Overnight Sky Observation – B K Birla School of Education, Shirgaon, Maval, Pune:

The Overnight Sky Observation Program (1st February 2025), organized by Nehru Science Centre, Mumbai, was an unforgettable experience for 350 students and teachers at B K Birla School of Education, Shirgaon, Maval, Pune.

The evening kicked off with a fascinating Liquid Nitrogen Demonstration, followed by Sunspot Observation using solar-filtered telescopes. As night fell, participants marvelled at celestial wonders—Saturn's rings, Jupiter's moons, the Pleiades Cluster, and the Moon's craters—guided by expert astronomers. Engaging in discussions on planetary movements, constellations, and space exploration kept curiosity alive until 1:00 AM.

Students enthusiastically interacted, posing thought-provoking questions about space science and career opportunities in astronomy. The event not only ignited a passion for stargazing but also deepened appreciation for the universe.

Sky Observation Program at Nehru Science Centre, Mumbai:

Nehru Science Centre, Mumbai, hosted a series of Sky Observation Programs on multiple dates in February, drawing an enthusiastic response from 564 paid participants and 450 free attendees—including students, educators, and astronomy lovers.

Each session featured guided telescope views of celestial wonders like the Moon, Saturn, Jupiter, Venus, Mars, star clusters, and double star systems.

Experts from NSC Mumbai enriched the experience with insights into constellations, planetary movements, and deep-sky objects, making learning interactive and engaging.

Attendees showed great curiosity, sparking discussions on astronomy, space science, and career opportunities. The overwhelmingly positive feedback highlights the program's success in inspiring interest in observational astronomy and reinforcing NSC Mumbai's dedication to science outreach.

Innovation Hub: Exploring Science Through Hands-On Learning (1, 8 & 15 February 2025)

The Innovation Hub kicked off February with a series of interactive science sessions designed to enhance experimentation, observation, and creative problem-solving skills among students.

Skills of Experimentation & Observation (01.02.2025) Dr. P.K. Joshi led an insightful session on the art of keen observation and experimentation, emphasizing the role of detail-oriented analysis and critical thinking in scientific discoveries.

"**Kabad se Jugaad**" (08.02.2025) Students exercised their ingenuity by transforming discarded materials into innovative science toys, fostering creativity and resourcefulness.

"**Tod Fod Jod**" (08.02.2025) Participants explored the inner workings of everyday mechanisms, dismantling and reassembling devices like motors and bicycle gears under expert guidance.

Electromagnetism (08.02.2025)A hands-on session where students built homopolar motors, gaining practical insights into electromagnetism and its applications in generators and motors.

Marathi Malayali Ethnic Fest 2025:

The Marathi Malayali Ethnic Fest 2025, held from 14th to 16th February at Nehru Science Centre, Mumbai, in collaboration with AMMA Foundation, was a vibrant celebration of the rich cultural heritage

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IN THE LAST QUARTER...

FEB 2025

Sir C. V. Raman Memorial Lecture 2025

The Sir C. V. Raman Memorial Lecture was delivered by Dr. Shankar V. Nakhe, distinguished scientist and former Director of RRCAT, Indore, on February 28, 2025. Speaking on "Odyssey of Raman Effect Applications & its Relevance to 'Viksit Bharat'", Dr. Nakhe highlighted Sir C. V. Raman's scientific journey, his groundbreaking discovery of the Raman Effect, and its lasting impact on modern physics and spectroscopy

His insightful lecture emphasized Raman's passion for science, meticulous experiments, and their relevance in today's technological advancements. The event saw an enthusiastic participation of 286 students and teachers from various schools, making it a truly inspiring tribute to the legendary physicist.

Science Demonstrations & Lectures:

Fascinating demonstrations such as "Science vs. Miracle," Liquid Nitrogen experiments, and the launch of "Mathematics Beyond Numbers" captivated audiences. Special lectures on Prof. S. N. Bose and the legacy of Sir C. V. Raman, attended by hundreds, enriched scientific understanding.

Sky Observation & Virtual Reality: Visitors explored the wonders of the cosmos through sky observation programs and immersive VR experiences, witnessing celestial bodies up close.

Prize Distribution Ceremony: The event concluded with a grand prize distribution, recognizing the winners of various contests.

The week-long celebration successfully fostered scientific spirit and innovation, leaving participants inspired and eager for more discoveries.

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IN THE LAST QUARTER...

MAR 2025

Quiz and Sky Observation Programme at (MuSo)

Nehru Science Centre, Mumbai, in collaboration with the Museum of Solutions (MuSo), organized an engaging Quiz and Sky Observation Program on 1st March 2025. Around 50 participants, including students and astronomy enthusiasts, took part in the event. The program began with a lively quiz exploring space science and astronomy, followed by a sky observation session using 8-inch telescopes. Participants observed the Moon, Venus, Jupiter, Mars, and the Orion Nebula (M42) under expert guidance. The event successfully sparked curiosity and promoted interest in astronomy and space exploration.

Customized Workshop on Energy and Its Types

A customized workshop on "Energy and Its Types" was conducted at the Nehru Science Centre for 8 students from Steller World School. The session covered concepts of energy, its various forms, and real-life applications. Interactive discussions, hands-on experiments on energy transformations, and solar-powered model building helped deepen the students' understanding. The importance of renewable energy sources was also emphasized.

Celebrating the 50th International Women's Day at Nehru Science Centre

The Nehru Science Centre, Mumbai, celebrated the 50th International Women's Day on March 8, 2025, with 32 enthusiastic participants. Themed "Accelerate Action," the event aimed to inspire women, especially teachers and homemakers, to spark curiosity about science in children. Engaging activities were conducted throughout the day to promote scientific thinking and awareness.

STEM Academy Science Demonstrations: Engaging Students in Sound and Chemistry

In March 2025, STEM Academy hosted three Science Demonstration Lectures (SDLs) for 180 students, covering exciting topics in Sound and Chemistry.

Sound Demonstrations: Held on 18th and 21st March, these sessions explored sound properties, its transmission, and real-life applications, with hands-on activities that deepened student engagement.

Chemistry Workshop: Conducted on 24th March, this interactive session introduced fundamental concepts such as the periodic table, acid-base reactions, oxidation-reduction, and exothermic/endothermic reactions through practical demonstrations.

These engaging demonstrations sparked curiosity and encouraged students to explore STEM fields further.

Customized Workshop on the Properties of Air:

On 27th March, a special customized workshop was held for 48 students from Aditya Birla School. The students delved into the properties of various gases such as nitrogen, oxygen, neon, carbon dioxide, and hydrogen. In addition to learning the scientific properties of these gases, the students gained a deeper understanding of how air plays a crucial role in sound instruments and the concept of air's expansion and contraction. The workshop featured hands-on activities, experiments, and discussions that helped students connect the theoretical concepts with real-world applications.

World Water Day Celebration:

On 22nd March 2025, Nehru Science Centre, Mumbai, celebrated World Water Day to promote awareness about water conservation. The event featured:

- **Open House Quizzes:** Engaging quizzes on water conservation, attracting participants of all ages.
- **Film Screening:** A thought-provoking short film on the global water crisis, highlighting issues like scarcity and pollution.
- **Science on a Sphere Show:** Interactive visual presentations on ocean currents, climate change, and the water cycle, emphasizing human impact on water resources.

The celebration inspired visitors to take action towards responsible water usage.

Celebrating Women in Healthcare: International Women's Day Event

On 22nd March, the National Science Centre (NSC), Mumbai, in collaboration with the National Centre for Science Communicators (NCSC), hosted a special event to celebrate International Women's Day. The event highlighted the remarkable contributions of women doctors in the healthcare sector through a panel discussion and a special lecture.

IN THE LAST QUARTER...

MAR 2025

The expert panel featured:

· **Dr. Sunali Khanna** – Professor & Head, Oral Medicine and Radiology, Nair Hospital Dental College, Mumbai

· **Dr.Veena Aurangabadwalla** – Obstetrician & Gynaecologist, Zen Hospital, Chembur

· **Dr. Rima S. Pathak** – Professor, Radiation Oncology, Tata Memorial Centre, Mumbai

· **Dr.Sonal Rakshpaul** – Consultant Developmental Neonatologist, Wadia Children's Hospital & Surya Hospital, Mumbai

These distinguished women inspired the audience by sharing their professional journeys and contributions, celebrating their dedication and success in advancing healthcare and science.

Nehru Science Centre Mumbai's Exhibition at Standards Carnival

Nehru Science Centre Mumbai (NSCM) will showcase an exhibition at the Standards Carnival organized by the Bureau of Indian Standards (BIS), Mumbai-2, on 28th March 2025 at Pillai HOC College of Engineering. The exhibition, held at the Community Center, will highlight the role of standards in science, technology, and industry, aiming to create awareness among students, educators, and industry professionals. With an expected footfall of around 1,000 visitors, this collaboration with BIS and Pillai HOC College will provide a valuable platform for learning and engagement.

Sci-Birthday Events:

March 12, 2025: A Sci-Birthday event was successfully conducted for 50 participants. The event featured exciting science demonstrations, including the Science on a Sphere show, a 3D show, a Sparkling High Voltage demonstration, and a Supercool Liquid Nitrogen show, along with engaging hands-on activities.

March 29, 2025: Another Sci-Birthday event is scheduled from 10:00 AM to 2:00 PM for 50 participants. The event promises an engaging lineup of science demonstrations and interactive activities, aiming to spark curiosity and inspire young minds.

Mobile Science Exhibitions (MSE) – March 2025

·**Curriculum-Based MSE:** Covered 12 sites in Pune district over 17 days, engaging 9,213 visitors.

·**Health & Sanitation MSE:** Visited 9 sites in Thane for 15 days, benefiting 5,019 visitors.

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Reopening of the Hall of Nuclear Power Gallery

The Hall of Nuclear Power Gallery was reopened on 24th March 2025 by Shri Bhuwan Chandra Pathak, Chairman & Managing Director, NPCIL, in the esteemed presence of Shri B.V.S. Shekar, Executive Director (Corporate Planning & Communication), NPCIL. The event was also graced by Shri Umed Yadav (Corporate Planning & Communication), NPCIL, and Shri Umesh Kumar Rustagi, Director, Nehru Science Centre.

NSC - A Wonderland of Science

Science Park: Full of interactive exhibits on principles of energy, mechanics, perception & relics from the past: railway engines, tram cars, aircraft, electric power generator in park spread over 8 acres in green environment with over 200 species of plants and picnic area for school groups.

Permanent Exhibitions: The main building houses galleries full of exciting, interactive & interesting exhibits on topic relevant to school curriculum and for general public to make them appreciate Science with fun.

- **Reception**
- **Science for Children**
- **Sound & Hearing**
- **Mirror Gallery**
- **Machined to Think**
- **Evolution**
- **Human and Machine**
- **Our Technology Heritage**
- **Prehistoric Life**
- **Hall of Nuclear Power**
- **Hall of Aviation & Space**

Regular Programmes / Activities

SCIENCE ODYSSEY

The Science Odyssey facility with 18m dia Spherical Dome & fish eye lens projection system set up at the Centre, is the first of its kind in this region. It provides an opportunity to learn science in an immersive ambience. special shows can be arranged on request.

Now Showing "Australia's Great Wild North" Check our website for updates: https://nehrusciencecentre.gov.in/

High Voltage Demonstration

Nehru Science Centre, Mumbai has set up the first of its kind High Voltage Demonstration facility titled 'Sparkling High Voltage Demonstration' which is now opened for the visitors.

This new facility offers some impressive demonstrations with a 200kV AC transformer, spectacular display of sparks & sounds with a Large TESLA Coil producing up to 1.50 million-volts and many more supporting equipments like Lichtenberg Tree Formation set-up, Jacob's Ladder, Arcing Horns, etc. wherein visitors can see disruptive discharges through air, sliding discharges over a glass plate, the demonstration with Faraday's cage, artificially generated lightning, etc.

Science on a Sphere

The state-of-the-art educational visualisation tool patented by the National Oceanic and Atmospheric Administration (NOAA), USA, is the first of its own kind in the western part of India. The Science On a Sphere provides real time atmospheric and climatic data that is projected on the 1.8 metre Spherical globe. The giant animated sphere appears to be floating in mid-air, and even rotating on its axis. You can see oceans & continents in their actual colours (just as our planet appears from outer space), Tropical rain forests, Currents of the oceans in motion, Moon, Jupiter and Mars. This amazing, cutting-edge technology, the SOS, was invented by NOAA to educate the audience on earth and space systems in a three-dimensional format. This technology is now available worldwide for science centres, museums, educational institutes etc.

3D Science Show

The visitors to the 3D Science Show will experience an out of the world immersive experience in which the near realistic visuals will appear to come out from the static screen right in front of their eyes. The shows would be conducted every hour at the Centre for the general public & school groups.

Science Show (Live Demonstration)

Exciting science demonstrations on Air, Sound, Chemistry is Fun and Fun with Physics etc. are organized regularly at the Centre thrice a day.

Sky Observation Programme

Every Saturday & Sunday after Sunset (Weather permitting)

Entry fee per visitor to Science Centre & its special facilities.

You can book online
Entry Ticket to
Nehru Science Centre
https://nscm.in/general-ticket/

Follow the Steps:

1. Book your ticket
2. Go to Cart and confirm it is of correct type
3. Go to Checkout and pay using Net Banking, Credit Card, Debit Card or UPI app

Book Online

Particulars	Amount
Entry Ticket to Science Centre Only	
• General Visitors	Rs.70/-
• Group of Visitors (15 or more)	Rs.60/-
• Students in organised group with authority letter	Rs. 20/-
• Students from Govt./Municipal Schools with authority letter	Rs. 10/-
• BPL card holders on producing the card	Rs. 5/-
Entry Ticket ONLY to Science Park - General Visitors	Rs.20/-
Special shows - Science Odyssey	
• General visitors	Rs.80/-
• Group of Visitors (15 or more)	Rs.70/-
• Students in organised group with authority letter	Rs.50/-
• Students from Govt./Municipal Schools with authority	Rs.25/-
Motion Simulator Ride	
• General visitors	Rs.50/-
• Group of Visitors (15 or more)	Rs.40/-
3D Science Show / Science on Sphere	
• General visitors	Rs.30/-
• Group of Visitors (15 or more)	Rs.25/-
• Students in organised group with authority letter	Rs.20/-
• Students from Govt./Municipal Schools with authority letter	Rs.10/-
Science Film Show / Science Demonstration Lecture (on prior booking)	Rs.10/-
Package ticket for Science Centre & Science Odyssey	
• General visitors	Rs.130/-
• Group of Visitors (15 or more)	Rs.110/-
• Students in organised group with authority letter (Non-Member Schools)	Rs.60/-
• Students in organised group with authority letter (Member Schools)	Rs.50/-
• Students from Govt./Municipal Schools with authority letter	Rs.25/-
Special Packages	
• Science Centre, 3D show & SOS show for General visitors (Science Centre, Science Odyssey, Sparkling High Voltage, 3D show & SOS show)	Rs.100/-
• Students in organised group with authority letter (Non-Member Schools)	Rs.90/-
• Students in organised group with authority letter (Member Schools)	Rs.75/-
• Students from Govt./Municipal Schools with authority letter	Rs.40/-
Family Packages	
Science Centre, Science Odyssey, Sparkling High Voltage, 3D show, SOS show & Motion Simulator Ride.	
• Family of 4 members	Rs.600/-
• Family of 6 members	Rs.900/-
(Buy Family Ticket to Save & have lot of FUN)	
Parking Charges	
2 Wheeler	Rs.30/-
4 Wheeler	Rs.50/-

Timing

Nehru Science Centre is open to public every day including Sundays and public holidays

Opening hours:
09.30 AM to 06.00 PM

Ticket Counter Timing:
09.30 AM to 05.30 PM

Closed on Holi & Diwali.

Free Entry only to Science Centre :
Children up to 3.4 feet (102 cm) of height
Defense & Paramilitary forces in uniform
Physically challenged persons and ICOM members
For other facilities visitors have to pay specified fee as per the category.

"All of us do not have equal talent, but all of us have an equal opportunity to develop our talents"

- Dr A P J Kalam

Designed & Developed by

NEHRU SCIENCE CENTRE

A Unit of National Council of Science Museums, Ministry of Culture, Govt. of India

Dr. E. Moses Road, Worli, Mumbai - 400 018

022-31059020, edu.nscm@gmail.com, nehrusciencecentre.gov.in

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