VAPS KNOWLEDGE
SERVICES PVT. LTD.

Think
Creative!

VAPS SMART SCIENCE PARK

LEARNING THROUGH PLAY

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INTRODUCTION

Science and its application as technology play a dominant role in shaping the destiny of a country science parks go a long way in creating an enthusiasm to pursue science, by learning through play.

WHAT IS SCIENCE PARK

Science Park consist of a cluster of interactive open air display models for playing and learning of keep science, it covers many topics in science like mechanics, optics these models will be installed in a Science Park in one place.

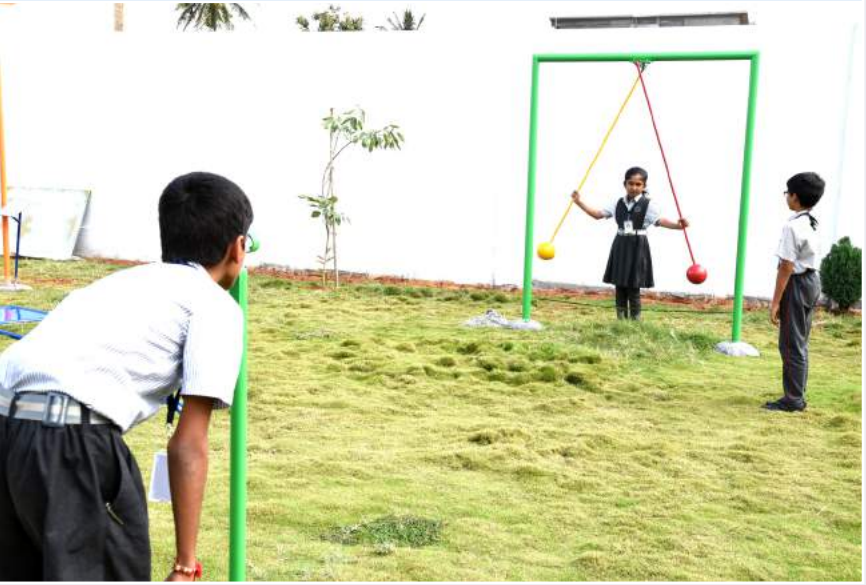
OBJECTIVES

- To provide an opportunity to children to interact with gadgets by themselves and discover the principles of science informally.
- Instead of restricting the Science inside the laboratory, we make the Science lab explorable openly. Our Science Park Models are designed to educate the staff and students on modern Science.
- Our Outdoor Science Park Models to attract the students during the leisure time to explore various experiments and experience themselves to enhance the scientific knowledge.
- To promote scientific literacy among the general public. The following are some of the science models which are ready to be installed and displayed.

3-D PENDULUM

The light allowed into each of our eyes is varied to create an illusion.

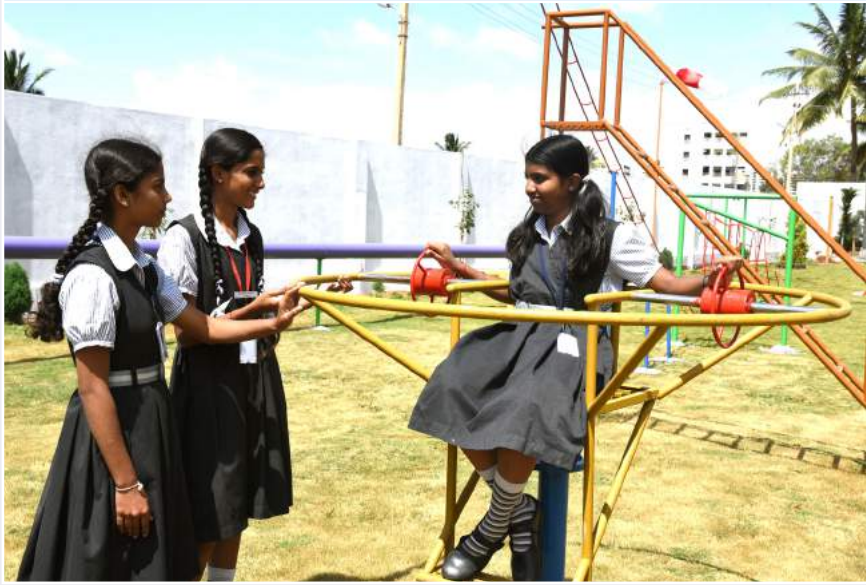
Principle: Optical Illusion.



ANGULAR MOMENTUM

A rotating object tends to remain rotating with a constant angular momentum when acted upon by an external torque

Principle: Conservation of angular momentum.



ARCHIMEDES SCREW

This is one of the earliest of simple machines used primarily to transfer water from a lower lying body of water to a higher level.

Principle: Screw as a simple machine.

BARTONS PENDULUM

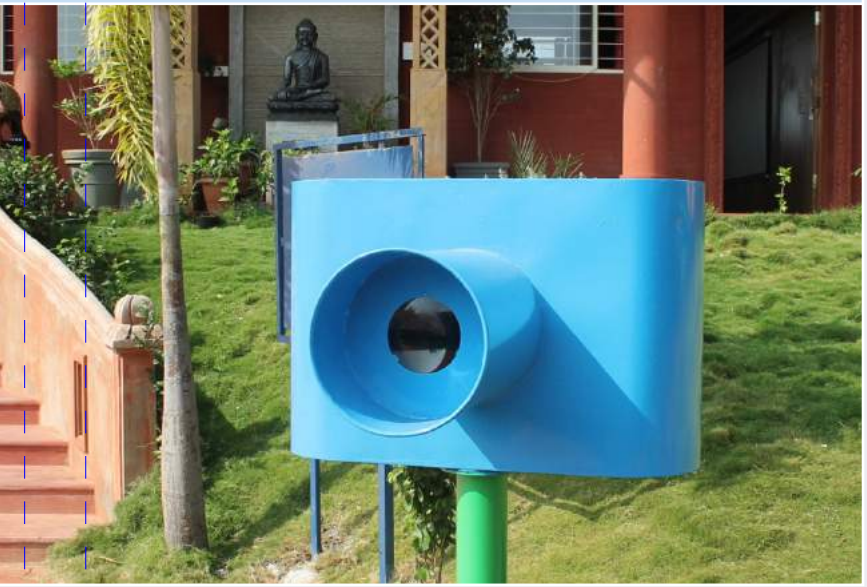
A system can be forced to oscillate by using a driving frequency.

Principle: At resonance, there is maximum transfer of energy

CAMERA

A camera is an optical instrument used to capture an image on a desired medium film, Charged- coupled device (CCD) Complementary metal- oxide-semiconductor (CMOS)

Principle: Formation of image in a camera is shown.



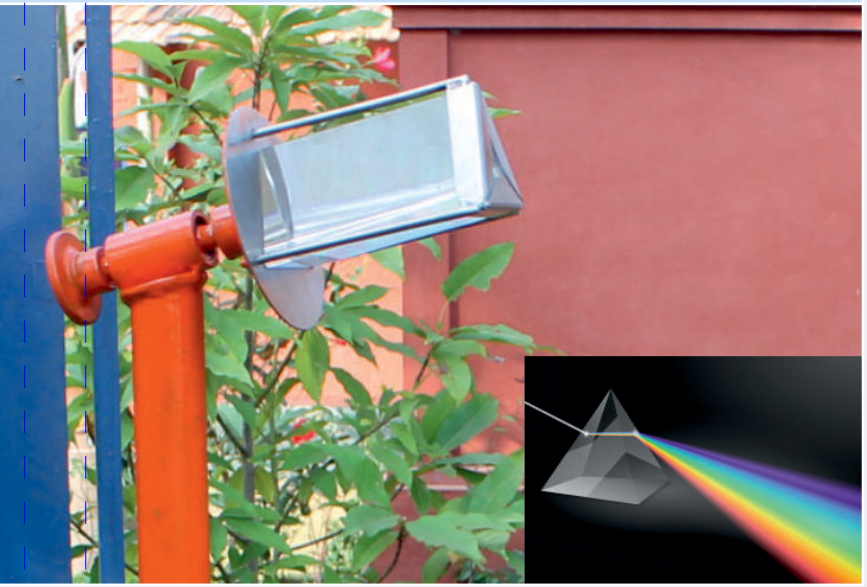
CENTRIFUGAL FORCE

An object travelling in a circle behaves as if it is experiencing an outward force. This force, known as the centrifugal force, depends on the mass of the object, the speed of rotation, and the distance from the centre.

Principle: The apparent force that is felt by an object moving in a curved path that acts outwardly away from the centre of rotation.

PRISM

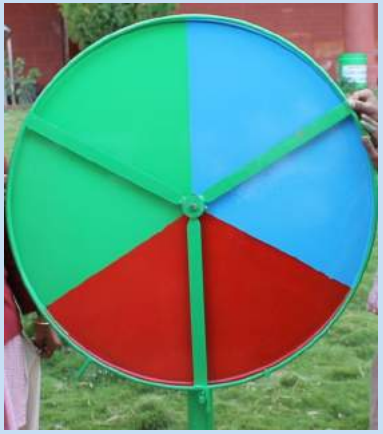
Transparent glass object which separates light that passes through it into the seven different colours

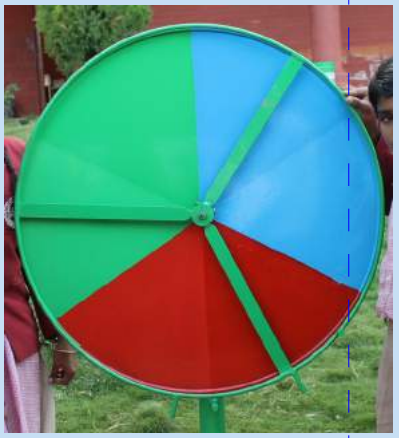


COLORS CONTRAST

Each pair of adjacent sectors of this circle are painted with slightly different shades of the same colour. Rotate the wheel such that the spokes block the lines separating the two shades. The difference in the shades can no more be seen

Principle: The brain recognises the two shades as different only if the boundary between them is sharp.





CREATOR AND MOUND

The brain perceives the image as a crater or a mound depending on whether the image is illuminated from above or below. The image appears as a crater if the bottom portion is illuminated and as a mound if the top portion is illuminated.

Principle: Optical illusion:

CYCLOID PATH
(BRACHISTO CHRONE PROBLEM)

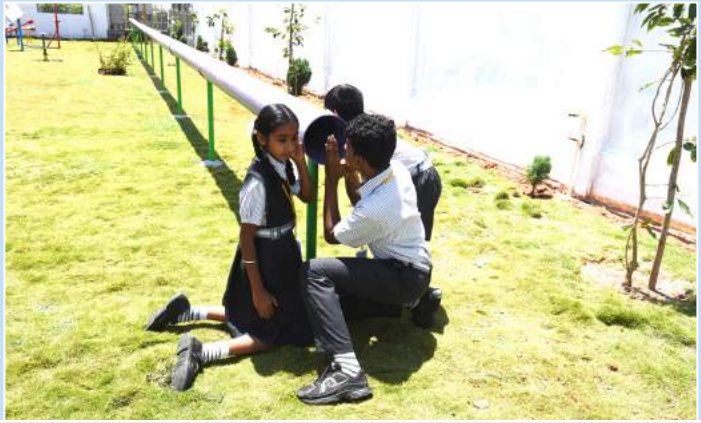
An object released simultaneously along a straight path and a cycloid path, reaches the bottom of the cycloid earlier.

Principle: Conservation of energy

ECHO TUBE

The gadget consists of a long hollow tube with one end closed. Place your mouth at the open end of the tube and make a short, low noise. What happens? You can hear a clear echo of your voice. How?

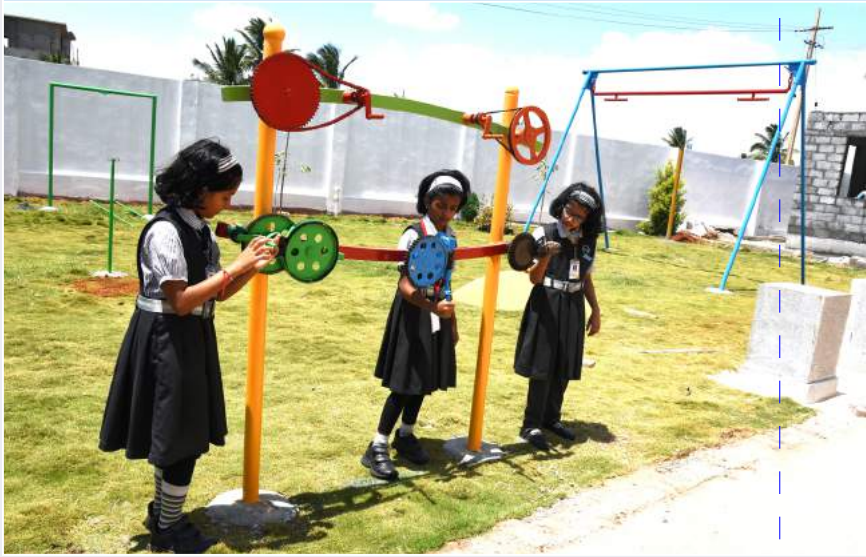
Principle: For getting a clear echo of a sound, there must be a minimum time lag of (1/10)th of a second between the original sound and its echo. We know that the velocity of sound is 330 meters/ second. The length of the tube is 30 meters. The sound wave travels 60 meters, totally (i.e. 30m + 30m). The sound waves take more than (1/10)th of a second to cross the total length of the tube and return to our ears. Hence we get a clear echo.



GEAR (TRANSMISSION)

A toothed wheel that engages another toothed mechanism in order to change the speed or direction of transmitted motion is a gear. Gears meshing in series form a `Gear train`

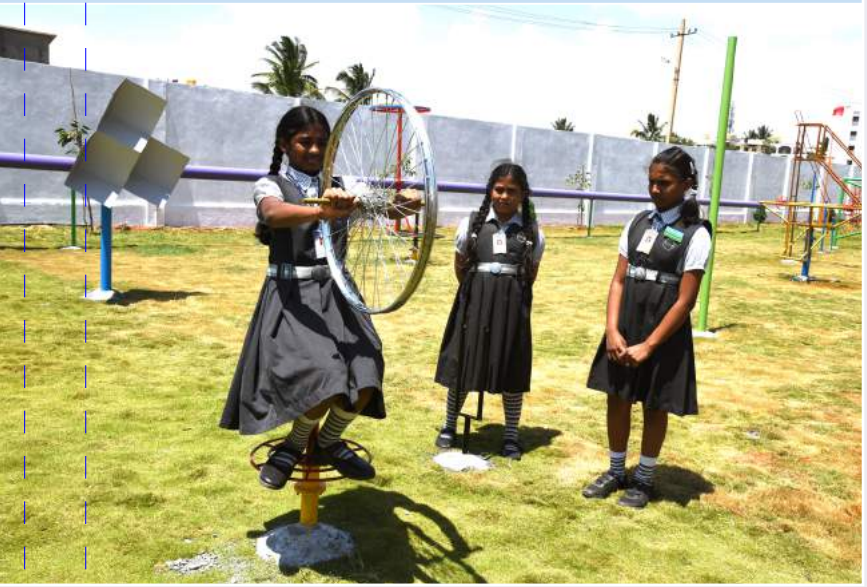
Principle: Forces can be transmitted, modified, and made to change direction. Pulley changes the direction of the force applied to the load. Liver is a rigid bar that helps to lift weights with less effort. Lever is in equilibrium when the load and effort balance each other



GYRO SCOPE

The gadget consists of a spinning wheel in which the axle is free to assume any orientation. Here a bicycle wheel with axle is considered as a gyroscope.

Principle: Conservation of Angular momentum.



HEAT PERCEPTION

Different colored objects absorb different amounts of heat.

Principle: Black bodies absorb more radiation and white absorbs least.

INCLINED PLAIN

The gadget consists of three objects of same mass placed on three planes with different inclinations. Pull the handles one by one to realise the effort required to pull the objects along planes with different inclinations.

Principle: An inclined plane reduces the effort required to move an object to a higher position. More the inclination of plane, more is the effort required to move the object and vice-versa.

LOOP THE LOOP

In a uniform circular motion the normal force and the gravitational force are directed towards the center.

Principle: Uniform circular motion

MOTION PERCEPTION

In motion pictures the scenes in the picture appear to be continues due to persistence of vision.

Principle: Visual impressions are retained by the retina of the eye for 1/16 of a second.

MUSICAL PIPES

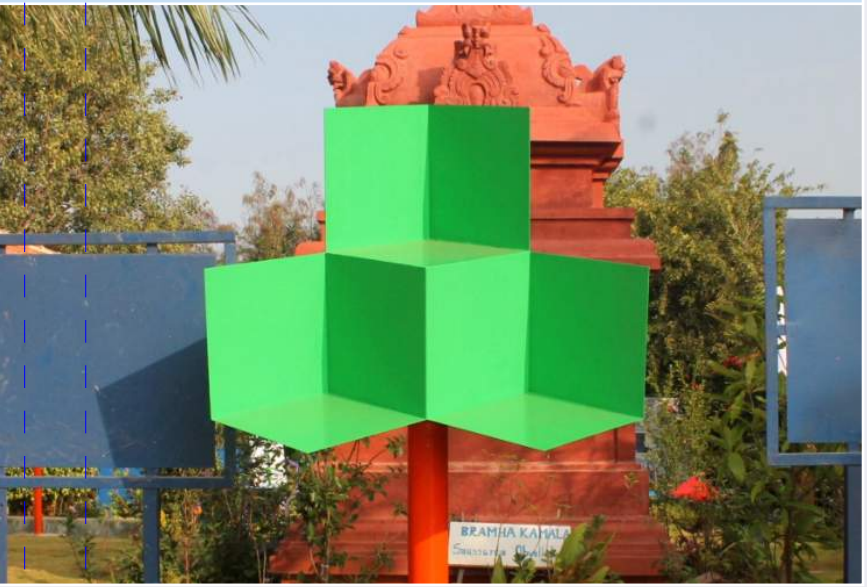
Musical pipes illustrate how notes with different frequencies are produced when they are struck with a hammer.

Principle: Sound originates in a vibrating air column and its frequency depends on the length of the column.

CUBE OPTICAL ILLUSION

The gadget consists of one protruded and three intruded cubes. When you stare at the protruded cube for a while from a distance, the intruded cubes seem to be protruded and vice-versa.

Principle: Optical illusion: The brain is tricked while perceiving the depth of the object and these results in an illusion of protruding cubes.



NEWTON'S III RD LAW

Sit on the chair and rotate the wheel in front of you in clockwise direction with a strong push. Observe that the equipment along with you tends to rotate in anti-clockwise direction.

Principle: Newton's III law. "For every action, there is an equal and opposite reaction". When the wheel is turned in clockwise direction with a force, an equal amount of force is applied in opposite direction which moves the equipment in opposite direction.

NEWTONS COLOR DISC

The Rainbow coloured discs on rotation give a white colour.

Principle: Spectrum of white light consist seven colours

OPTICAL ILLUSION

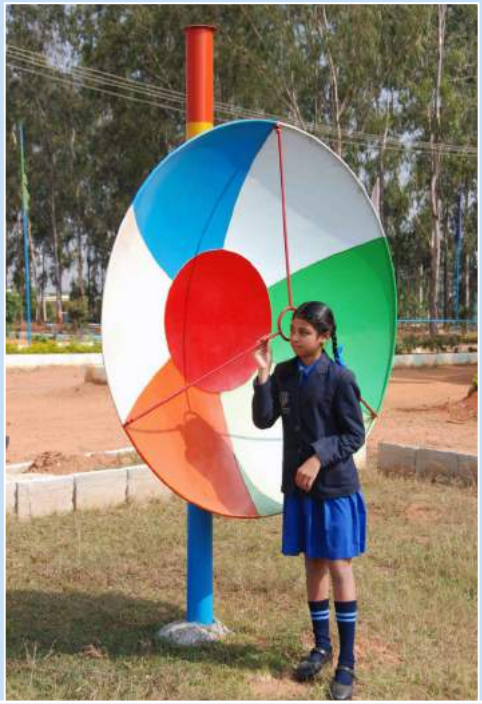
In this gadget, a metal plate has two pipes projecting out. Another small metal plate has been placed at a little distance away from the right pipe. Look through both pipes with both eyes open. While you see the distant scene clearly through the left eye, your right eye sees a non-existent hole in the small plate.

Principle: When you look through both eyes, one eye registers the hole in the tube as the other eye registers the small plate. The brain superposes the two views, resulting in an illusion of a hole in the plate.

PARABOLIC DISHES

Curved surfaces are known to reflect a parallel beam of light, converge to a point on the principal axis after reflection, sound waves also undergo reflection in a manner similar to light waves

Principle: Sound waves undergo reflection.



PULL YOURSELF UP

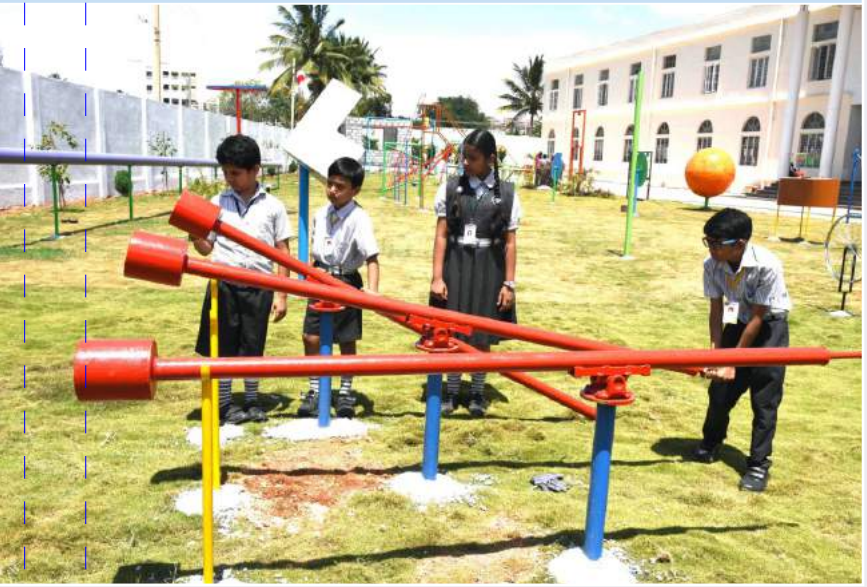
It is a device which can lift yourself up with ease.

Principle: Heavy loads can be lifted easily using pulleys

PRINCIPLE OF LEVER

A liver is a rigid bar that helps to lift weights with less effort

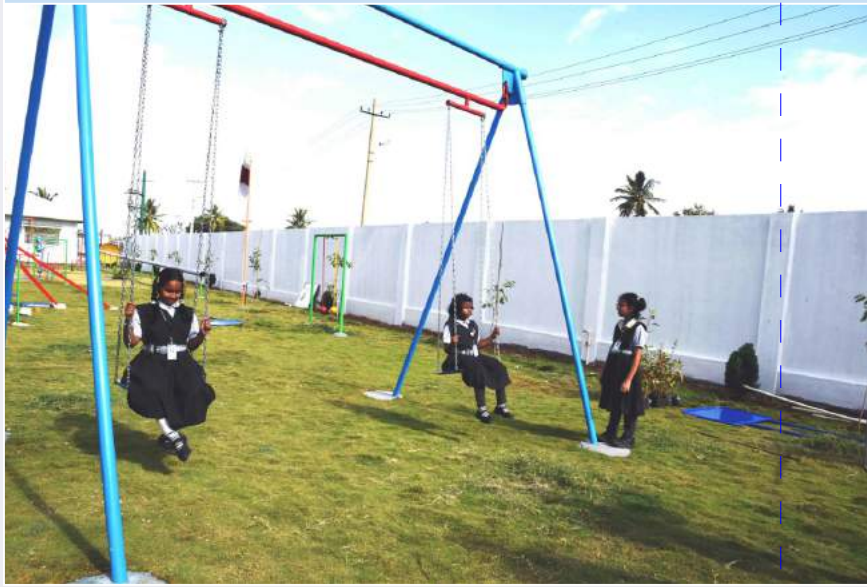
Principle: A lever is in equilibrium when the load and effort balance each other



SYMPATHETIC SWING

Two identical swings are suspended from a common support; they will swing back and forth if the support allows the motion of one swing to influence the motion of the other.

Principle: Every transfer occurs in a coupled pendulum.



UP HILL CONE

Two cones attached at their bases seem to roll up an inclined plane without any external force!

Principle: The center of gravity of the double cone will actually be going 'down' even though the entire object appears to be going 'up'.

VERTICAL SUN DIAL

Oldest known device for measurement of time based on the fact that the shadow of an object will move from one side of the object to the other as the sun moves from east to west during day time.

Principle: Shadows of objects are cast by the Sun.

WEIGHT AND PULLEY

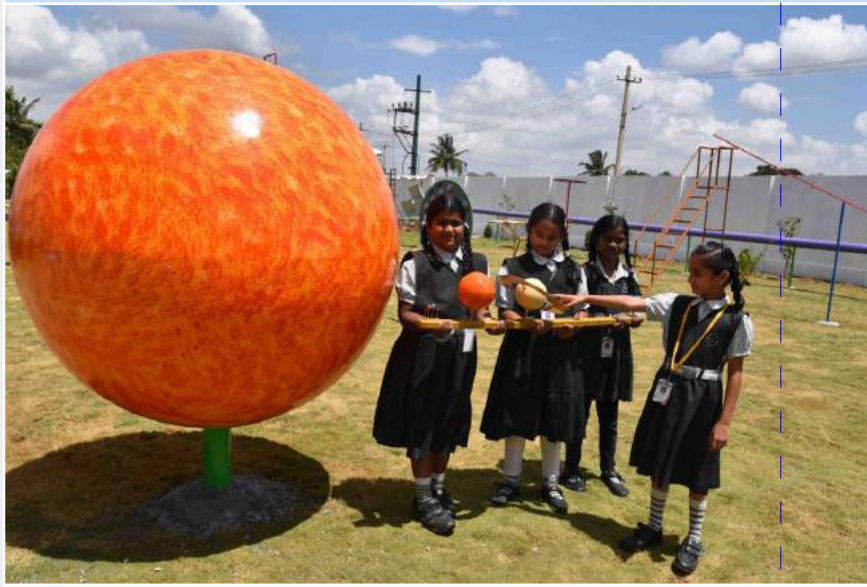
A pulley is a wheel over which a rope is passed for the purpose of transmitting energy and doing work.

Principle: A pulley changes the direction of the force applied to the load.

SCALE MODEL OF SOLAR SYSTEM

The exhibit consists of the scale model of solar system reduced to a scale of 1:1 billion Our solar neighbourhood is an exciting place. Sun plays the major role in it.

Sun-1.5 Meters, Mercury-5.2mm, Venus-13mm, Earth-13.7mm, Mars-7.2mm, Jupiter-154mm, Saturn-125mm, Uranus - 50.5mm, Neptune - 48.9mm



SCIENCE PARK MODELS

Sliver Package

1. Angular momentum
2. Camera
3. Centrifugal force
4. Colour contrast
5. Crater and Mound
6. Cube Optical illusion
7. Cycloid path
8. Gyro scope
9. Heat perception
10. Motion Perception (Horse)
11. Musical pipes
12. Newton's colour disc
13. Optical illusion
14. Parabolic dishes
15. Pull your Self Up
16. Resonant Pendulums
17. Spectrum from crystal glass prism
18. Uphill Cone
19. Vertical sundial
20. Weight and Pulley

Gold Package

1. 3-d pendulum
2. Angular momentum
3. Archimedes screw
4. Camera
5. Centrifugal force
6. Colour contrast
7. Crater and Mound
8. Cube Optical illusion
9. Cycloid path
10. Echo tube
11. Gyro scope
12. Heat perception
13. Inclined Plane
14. Loop the Loop
15. Motion Perception (Horse)
16. Musical pipes
17. Newton's III rd Law
18. Newton's colour disc
19. Optical illusion
20. Parabolic dishes
21. Principle of Lever
22. Pull your Self Up
23. Resonant Pendulums
24. Spectrum from crystal glass prism
25. Sympathetic swing
26. Types of Power Transmission
27. Uphill Cone
28. Vertical sundial
29. Weight and Pulley
30. Solar system (Sun Diameter 1.5 Meters)

Archimedes Screw

SCIENCE PARK MODELS

Platinum Package

1. 3-d pendulum
2. Angular momentum
3. Archimedes screw
4. Balancing the Pipe
5. Camera
6. Centrifugal force
7. Colour and Colour filters (RGB)
8. Colour contrast
9. Crater and Mound
10. Cube Optical illusion
11. Cycloid path
12. Distance
13. Echo tube
14. Equatorial Sun dial
15. Gyro scope
16. Heat perception
17. Inclined Plane
18. Loop the Loop
19. Mirrors (Concave and Convex)
20. Motion Perception (Horse)
21. Musical pipes
22. Newton's III rd Law
23. Newton's colour disc
24. Newton' Cradle
25. Noise Resonator
26. Optical illusion
27. Parabolic dishes
28. Persistence of Vision (Lotus)
29. Principle of Lever
30. Pull your Self Up
31. Race of Rolling Disc
32. Resonant Pendulums
33. Roberval Balance
34. See-Saw (variable weight)
35. Spectrum from crystal glass prism
36. Stroboscope
37. Sun Filters
38. Sympathetic swing
39. Transverse Waves
40. Types of Power Transmission
41. Uphill Cone
42. Vertical sundial
43. Wave Pendulum
44. Weight and Pulley
45. Wheel and Axel
46. Solar system (Sun Diameter 1.5 Meters)
47. Naadivalaya
48. Dakshinottara Bhitti
49. Samrat Yanthra
50. Penrose triangle

Angular Momentum

Principle Of Lever

CLIENTS:

- Chikkatti Group of Institutions, Gadag
- Jawaharlal Nehru Planetarium, Bangalore
- Regional Institute of Education, Mysore
- Kendriya Vidyalaya, Bangalore
- Regional Science Center, Ballary
- H. Narsimhaiah Science Center, Bangalore
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Creative!

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