

Gyan Bharati School

Saket New Delhi

Quest

A monthly Science and Mathematics magazine

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IDENTIFY THE SCIENTIST

- He is considered as the Father of Indian space program.
- He was born on 12th August 1919, in Ahmedabad.
- He founded the Physical Research Laboratory (PRL) in Ahmedabad when he was just 28 years old.
- He received the Tripos in Natural Sciences from Cambridge in 1940.
- He was also the Chairman of the Atomic Energy Commission .
- He was awarded with Shanti Swarup Bhatnagar Award (1962), Padma Bhushan (1966) and Padma Vibhushan (after death in 1972).
- He died on 30th December 1971 at Kovalam Thiruvananthapuram, Kerala.



Why is it difficult to track Asteroids?

Since, they are small and dark so difficult to track.
They may not reflect enough light for telescopes to easily detect

How Dangerous are Asteroids to earth?

If a rocky meteoroid larger than 82 feet hits Earth, it can pose a threat to a town or city. A space rock as big as 2 km in diameter could cause wide-scale devastation across the planet, affecting the climate

Where are Asteroids found?



Most of the asteroids are found orbiting the sun between Mars and Jupiter, which is the main asteroid belt. Some asteroids, called Trojans, share an orbit with a larger planet or moon. Only one Earth Trojan- an asteroid that shares the orbit with Earth- has so far been discovered.

Fun Experiments

1. Invisible Ink with Lemon Juice

What you'll need:

- Half a lemon
- Water
- Spoon
- Bowl
- Cotton bud
- White paper
- Lamp or other light bulb



Instructions:

- Squeeze some lemon juice into the bowl and add a few drops of water.
- Mix the water and lemon juice with the spoon.
- Dip the cotton bud into the mixture and write a message onto the white paper.
- Wait for the juice to dry so it becomes completely invisible.
- When you are ready to read your secret message or show it to someone else, heat the paper by holding it close to a light bulb.

What's happening?

Lemon juice is an organic substance that oxidizes and turns brown when heated. Diluting the lemon juice in water makes it very hard to notice when you apply it to the paper, no one will be aware of its presence until it is heated and the secret message is revealed. Other substances which work in the same way include orange juice, honey, milk, onion juice, vinegar and wine. Invisible ink can also be made using chemical reactions or by viewing certain liquids under ultraviolet (UV) light.

2. Bending Water with Static

What you'll need:

- A plastic comb (or an inflated balloon)
- A narrow stream of water from a tap
- Dry hair



Instructions:

- Turn on the water so it is falling from the tap in a narrow stream (just a few millimetres across but not droplets).
- Run the comb through your hair just as you normally would when brushing it (do this around 10 times). If you are using a balloon then rub it back and forth against your hair for a few seconds.
- Slowly move the comb or balloon towards the stream of water (without touching it) while watching closely to see what happens.

What's happening?

The static electricity you built up by combing your hair or rubbing it against the balloon attracts the stream of water, bending it towards the comb or balloon like magic!

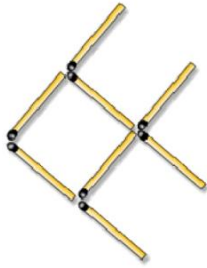
Negatively charged particles called electrons jump from your hair to the comb as they rub together, the comb now has extra electrons and is negatively charged. The water features both positive and negatively charged particles and is neutral. Positive and negative charges are attracted to each other so when you move the negatively charged comb (or balloon) towards the stream, it attracts the water's positively charged particles and the stream bends!

try the puzzle

	×		+		= 49
×		×		÷	
	×		-		= 16
×		+		+	
	+		+		= 16
=	=	=			
27	38	9			

swimming fish

Turn the fish around by moving only 3 matches, no overlapping.



	7	6	→15
9		1	→15
			→15
↙15	↓15	↓15	↓15
			↘15

At a party, everyone shook hands with everybody else. There were 66 handshakes. How many people were at the party?



Story time.....

Heliocentrism

Long ago the earth was supposed to be flat and that was because it looked flat. Though even today it looks flat, we know that it is not.

If we imagine ourselves in a ship in the middle of the ocean or in a grass land and see all around. What is the shape of the ocean, grass land and the sky? It appears as if the ocean and grass land are circles and the sky is like a bowl upside down. The horizon is where earth and sky appear to meet. This appears like a circle.

This was the earliest picture of the earth and sky in the mind of the ancient people. They thought that the earth is flat and that it goes on forever.

The sun rose in the east in the morning travelled across the sky and set in the west in the evening. Then next morning again it rose.

There were many fascinating stories to explain it. Some said that everyday new sun is formed and in the evening it sinks in the ocean. While other said that after the sun set, it was actually carried to the east again in the boat by some divine forces and then it rose again in the morning. Today these stories seem funny but they were accepted for years.

There were some geniuses who did not agree to all these stories. They had some questions in their mind:

If the earth is flat, then how deep is it? And if it is flat what keeps it from falling?

In India there were stories that the earth is resting on elephants. Elephants are resting on tortoise and tortoise is floating in ocean. This story was not acceptable to some thinkers.

Further if it is flat we should, by walking be able to reach the end of the slab, a point where the sun and earth meet. The horizon, but nobody could actually ever reach there. Rather no matter how much one travels the sun remains as far as it is. We never reach closer to the sun.

So people thought that may be the earth is smaller than the sky. But if it is so then water should spill over and we should be able to reach the end and then fall off.

But the answer was also another misconception .It was suggested that the earth is like a bowl so water can't spill over.

Some interesting facts were found about the sky by a Greek philosopher Anaximander.

The stars in the sky move in patterns not like a swarm of bees and that there is a star which remains above head and does not move at all.

If we travel towards north we see different stars from different places and very far we see entirely different lot of stars. Similar observation when we move towards south. But when we move towards east or west, we see the same set of stars though slightly shifted.

Why is it so? And what can it tell about the shape of earth?

It was thought that the earth may be cylindrical. On cylindrical earth if we go down the curved surface we move to the other side of the cylinder and see entirely different sky but moving along the axis of the cylinder, same set of stars is visible

It sounds logical but inconsistent with some more observations.

Observe an object such as an airplane flying away from us. After some time, it disappears from our site. When the objects move away from us, they appear smaller and smaller and finally not visible to us. But when we see a ship or a boat the way it disappears from our sight is different. How does it disappear? It was observed by various travelers that when a ship or a boat floats away from the shore first it's bottom part disappears and the topmost part at last, as if it is sinking in water but actually it is not. The boatman returns.This happens whether the boat is going towards east or west or north or south. They disappear same way.

Another clue to find out the shape of the earth is the shape of the moon. The moon as we see it is either spherical or a part of the sphere. Thinkers could conclude that it is the shadow of the earth due to which the moon is not complete whenever it is not i.e they could conclude that perhaps earth comes in between the sun and the moon due to which the moon is not visible completely.

Now connect all clues....

-a ship moving away disappear from bottom to top in whatever direction it goes, so the earth is not flat and also it is equally curved in all direction.

-moving north or south we see different sky but moving east or west we see same sky

The shadow of earth is spherical that's why moon shape is either a circle or part of the circle.

From all these we can conclude that earth is spherical in shape.

In course of time it was also established that earth was the center of the universe and all other heavenly bodies move around it and this was incorporated in religious texts.

However some thinkers challenged it also and believed that it is not the earth but the sun which is the center of the universe.

“There is talk of anew astrologer who wants to prove that the Earth moves and goes around instead of the sky, the Sun, the Moon...the fool wants to turn the whole art of astronomy upside down.’ said Martin Luther, about a famous astrologer of sixteenth century.

Nicolas Copernicus, the first astrologer to disprove the age old belief that the Earth was the centre of the universe and everything went around it. There were a few more astrologers who proposed this idea. Aryabhata not only told that the sun is the center of the universe but also wrote about the spin motion of the earth along with solar and lunar eclipse.

However it was not as easy as today to disprove anything at that time because the beliefs had the backing of the religious institutions. They made institutions called ‘Inquisition’ to deal with heresy- anything going against the existing beliefs. Unfortunately many were punished. Science and Religion were almost at war and Religion was supreme so Science suffered many casualties.

Copernicus escaped from being punished for heresy because he died a natural death.

Another legendary astronomer and genius Galileo Galilee had to not only apologize but also had to face house arrest for the rest of his life for challenging the geocentric theory.

However in nineteenth century, the church had to acknowledge heliocentric theory due to so many scientific studies and evidences. In 1990s the Vatican acknowledged that the treatment meted out to Galileo had been a mistake.

Presently we know that the sun is the center of our solar system and the planets move around it due to the gravitational force of sun

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