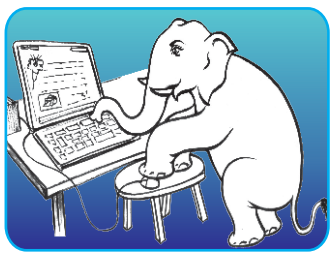
SCIENCE

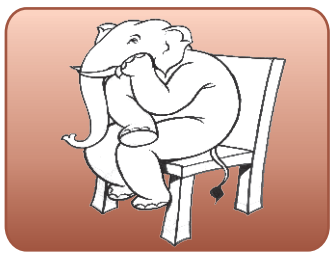
STANDARD FOUR

Term III

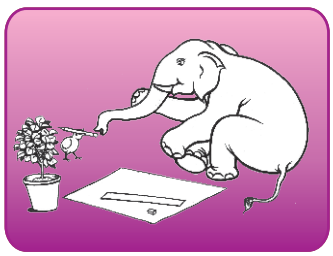
What these Icons stand for !



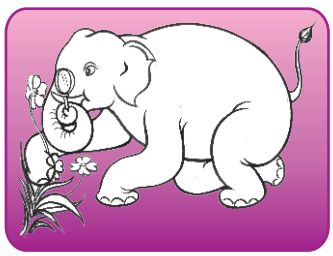
Do You Know ?



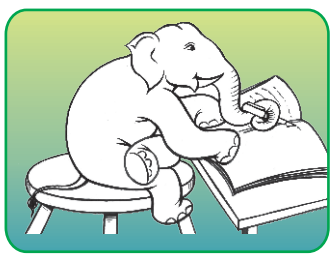
Think and write



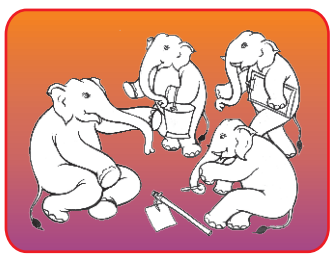
Project :



Activity



Evaluation



For Teachers...

1 AIR

A Melody in the breeze..

Air is a mixture - a gaseous mixture!
It's indeed easy to find its measure!!

Oxygen, our friend, supports life on earth,
And Nitrogen fertilizes the earth.

Carbon dioxide makes soft drinks fizzle!
while inert gases have been a puzzle!!

Water vapour from sea, river and stream,
And the hot, violent, angry whistling steam,

Into the cool air, they rise so slowly!
Merge as thick, soft clouds drifting so gently!!

Look! How softly they come down aglitter
To fill the earth with life - giving water!!

Like a widely spread blanket in the sky,
The clouds guard us from the heat from high.

Ceaseless atomic rays and cosmic dust
Assail our earth like an unwelcome guest.

Our dear pal ozone - oxygen, again -
Puts up a valiant defence in vain.

For man pollutes the air, makes little holes
In the umbrella meant to save our souls!!

To save this gracious earth, our own mother,
We've got to act now, dear sister, brother!

Shall we enjoy the breeze?

Do you like to play by making a paper fan?

When does the fan rotate faster?

Have you seen clothes sway along the cords ?

Why do trees, herbs and climbers sway?

Which are the months suitable to fly kites and why?

_____

_____

There is air around us. We cannot see air, but we can feel it. Air does not have colour or odour. Living organisms need air to breathe.

Water vapour in Air

Water vapour comes out while cooking. Have you seen it? The water vapour that comes out mixes with the air. What else is present in the air?

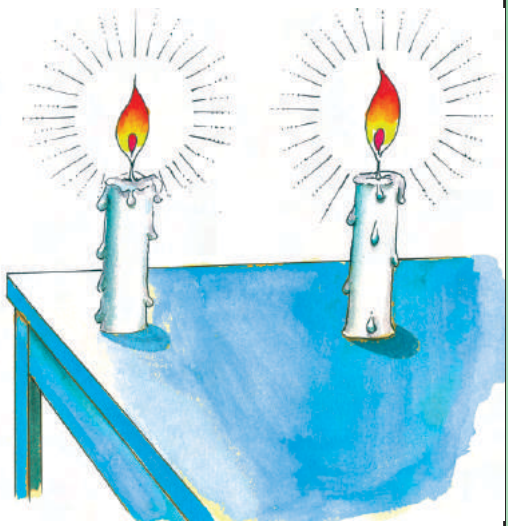
_____

_____

SCIENCE

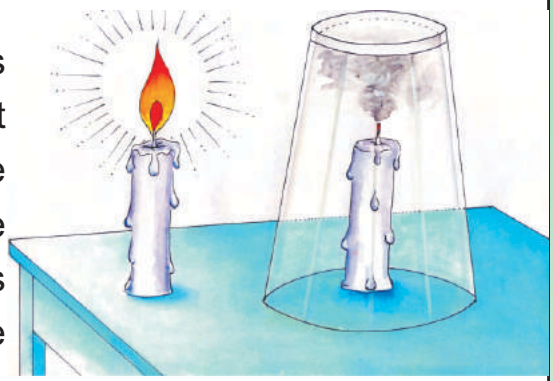
Activity

The burning of materials requires oxygen



Light two candles as shown in the picture. Keep one candle closed by a glass tumbler. What happens?

The candle which is kept closed is put out after a little while. But the one which is not closed, burns continuously, isn't it so?



Oxygen present in the air supports burning of materials. Oxygen present inside the tumbler is used up by the candle and hence it is put out. But the candle that is kept outside, still burns by taking the oxygen present in the air.

From this experiment we know that...

Oxygen is present in the Air.

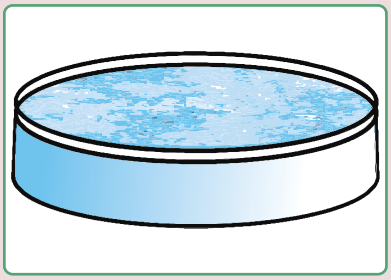
The burning of materials requires oxygen

Life-giving Air–Oxygen

Oxygen present in the air is needed for the respiration of man, animals and plants.

Is oxygen alone present in the Air?

SCIENCE



Activity

Take lime water (Calcium Hydroxide) in a wide mouthed vessel and keep it in the open. What do you observe?

A white layer forms on the surface of lime water. Doesn't it? Do you know what turns lime water milky? The carbon dioxide that is present in the air turns lime water milky.

Do you know?

Have you seen gas bubbles coming out from the aerated drinks bottles when opened? It is nothing but carbon dioxide which has been dissolved in the drinks.

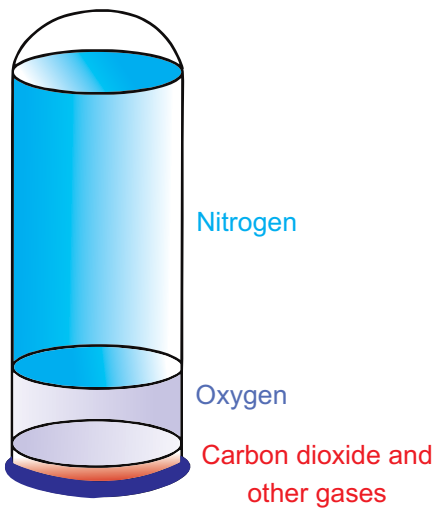
carbon dioxide is needed for the plants to prepare food.

Think it over!

Avoid aerated drinks, as they are harmful to health.

Do you know which gas is mixed in the air in more quantity than oxygen and carbon dioxide?

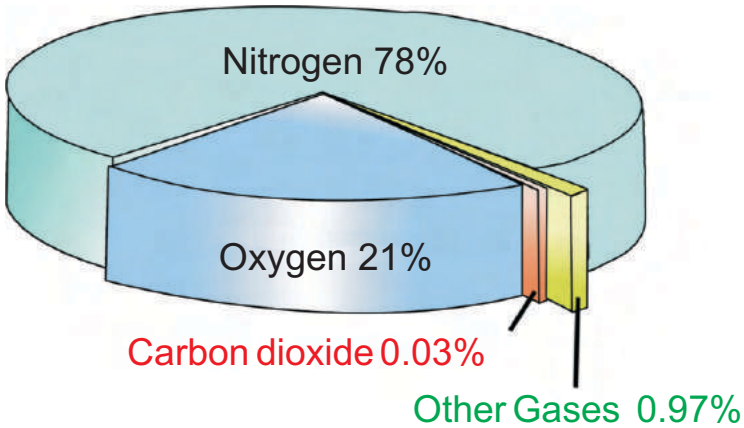
Among the gases present in the air four-fifth of the air consists of Nitrogen. It is necessary for the growth of plants. This requirement is fulfilled by the nitrogen that is in the air. Nitrogen does not support burning. What will happen if the air does not consist of nitrogen? Discuss with your teacher.



Air is a mixture

Gases like nitrogen, oxygen, carbon dioxide, water vapour and dust particles are mixed in the air.

Look at the percentage of gases in the air



Think and write

When we breathe in and breathe out, the percentage of the gases present in the air is given in the table.

Gases	Inspiration	Expiration
Oxygen	21%	18%
Carbon dioxide	0.03%	3%
Nitrogen	78%	78%
Water vapour	trace	more

- Which gas does get decreased during expiration?

_____

- Which gas does get increased during expiration?

_____

SCIENCE

Blanket that covers the earth

Due to the gravitational force of the Earth, there is a blanket of air about 1000 km thick around the earth. This is called the atmosphere. This atmosphere helps the living organisms to live, by providing the suitable temperature on the Earth.

Think it over!

Plants do not grow in the soil found on the Moon's surface. But if the same soil is brought to the Earth and the seeds are sown and watered, the plants would grow. Why? Astronauts fixed a tin flag on the Moon but not the flag made of cloth. Why?

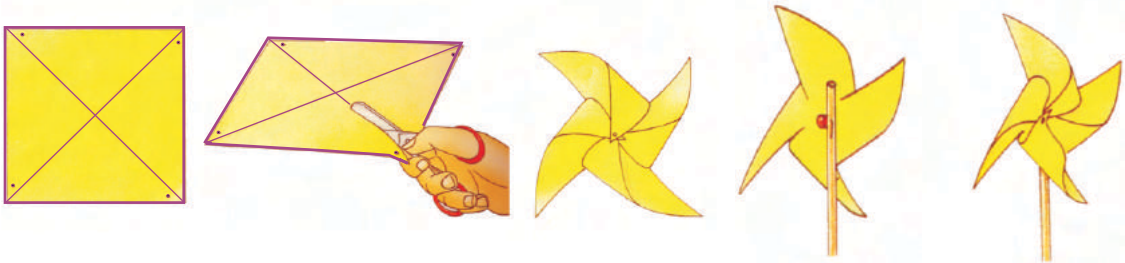
Do you know?

Poison mixed in the air:

In 1984, at Bhopal, the capital city of Madhya Pradesh, there was a leakage of methyl isocyanide gas from a factory. This resulted in the death of thousands of people.

Activity

Look at the picture and try to make a paper fan.



SCIENCE

Evaluation

(a) Fill in the blanks.

1. Air is a _____.
2. Plants require _____ gas to prepare their own food.
3. The percentage of oxygen in the air is _____.
4. The atmosphere provides suitable _____.
5. The _____ gas is present in soft drinks.
6. Burning of materials requires _____ .
7. Boiling of water resulted in the formation of _____.
8. During expiration _____ gas is at the highest percentage.
9. _____ is needed for the growth of plants.
10. While breathing, the percentage of the _____ gas remains the same.

(b) Match the gases in the air with their percentage.

1. Oxygen	-	78 %	☐
2. Carbon dioxide	-	0.97 %	☐
3. Nitrogen	-	21 %	☐
4. Other gases	-	0.03 %	☐

(c) Think and answer.

1. Mention the constituents of air.
2. How is nitrogen useful?
3. Mention two uses of oxygen.
4. Write short notes on the atmosphere.
5. What are the incidents by which we can find out that air is blowing?

Think it over!

How does the balloon used for advertisement, fly high in the air?

2 WATER

Rain—Data Calendar

SUN	MON	TUE	WED	THU	FRI	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

1. How many days did it not rain as per this calendar?
2. How many days did it rain as per this calendar?
3. How many days did it rain heavily?
4. From 13th for _____ days, it rained continuously.
5. What are the effects of continuous rain?
   - ❍ Flood
   - ❍ Falling of trees
   - ❍ Land slides
6. Where will the rain water flow when it rains continuously?

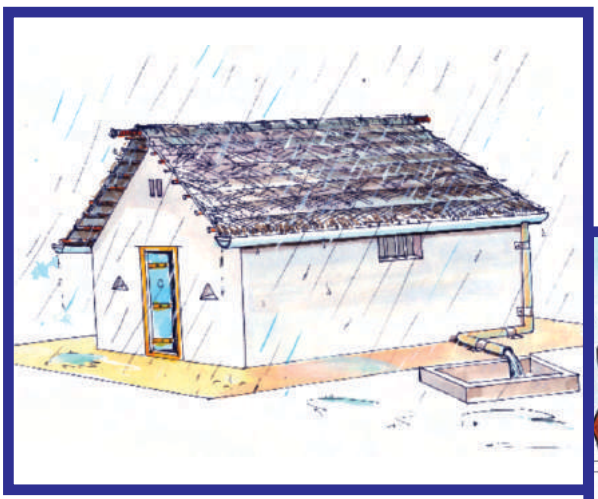
SCIENCE

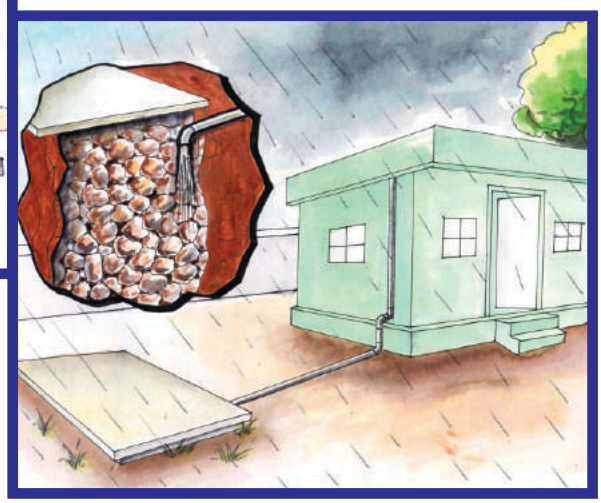
Water! Water!

The excess rainwater during rainy season is stored in natural ponds, lakes and canals. It is also stored in dams that are built across rivers. This kind of stored water can be utilized to check water shortage during the time of drought. Rainwater can be stored for drinking purpose by constructing rainwater harvesting pits. By this method, ground water level is conserved.

We can collect and conserve rainwater from the roofs of all types of houses through proper rainwater harvesting tanks.

Thus we can bring down the level of water shortage.





Do you know?

A few centuries ago Karikal Chozhan constructed Kallanai across the river Cauvery to conserve water.

Activity

Rain Gauge

Requirements : Cylindrical glass vessel, funnel, scale and thread.

Procedure : Place the funnel in the glass vessel. Keep the scale outside the vessel and tie it in such a way that '0' cm of the scale is at the bottom. Keep this set up in the open ground. Measure the amount of rain that fell for the whole day using the scale. The amount of rain for the whole day is _____cm.

Use this rain gauge and measure the amount of rain for a week and tabulate them.

Days	Amount of rain in cm
1	
2	
3	
4	
5	
6	
7	

Rain Gauge

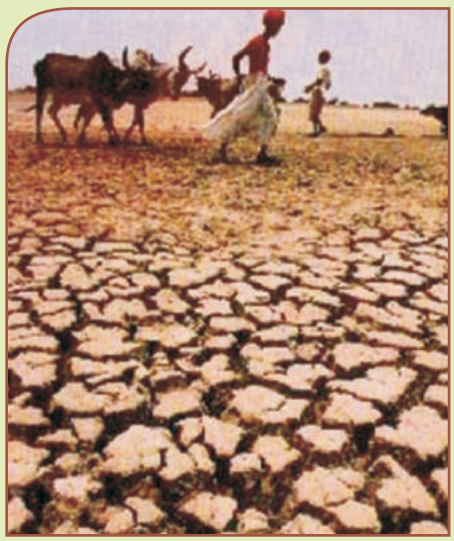
Find out from the newspaper and write what was the average rainfall last year in your district.

Activity

- What are the methods followed to conserve water in your area?
- How do you conserve rain water in your house?

Water Scarcity

Climatic conditions will not be the same throughout the year. During summer, as the temperature increases, the level of water from water resources such as river, pond, well and ground water table decreases. People of various parts of the country suffer from scarcity of water.



We do not get rain in all the months of a year. Whenever there is no rain it is sunny. Which are the months that experience high temperature in your area?

What will happen during the time of drought?

- Drying up of cultivable lands.
- Drying up of water resources.
- Scarcity of water.

Project:

Make a model of a Rain Gauge.

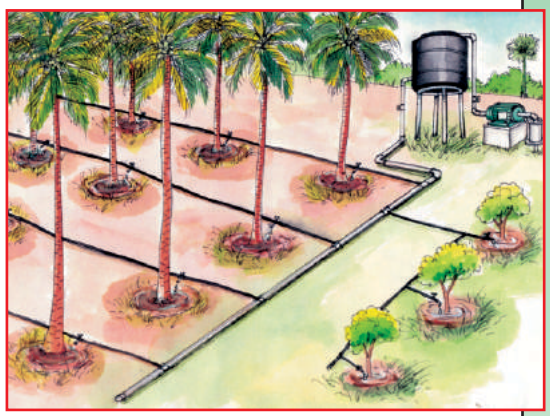
Water scarcity and its ill effects.

Due to the drying up of drinking water resources, we see people

- Buying drinking water.
- Waiting in long queue to get the drinking water.
- Bringing drinking water from far away places.
- Forest animals enter the residential areas in search of water.

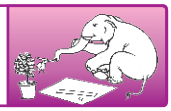
To use water economically

- Letting used water into the garden.
- We can water the plants using drip irrigation method.
- We can water the garden plants using a watering can.



Drip irrigation method

Project



Enter the quantity of water used in day-to-day life in the given table.

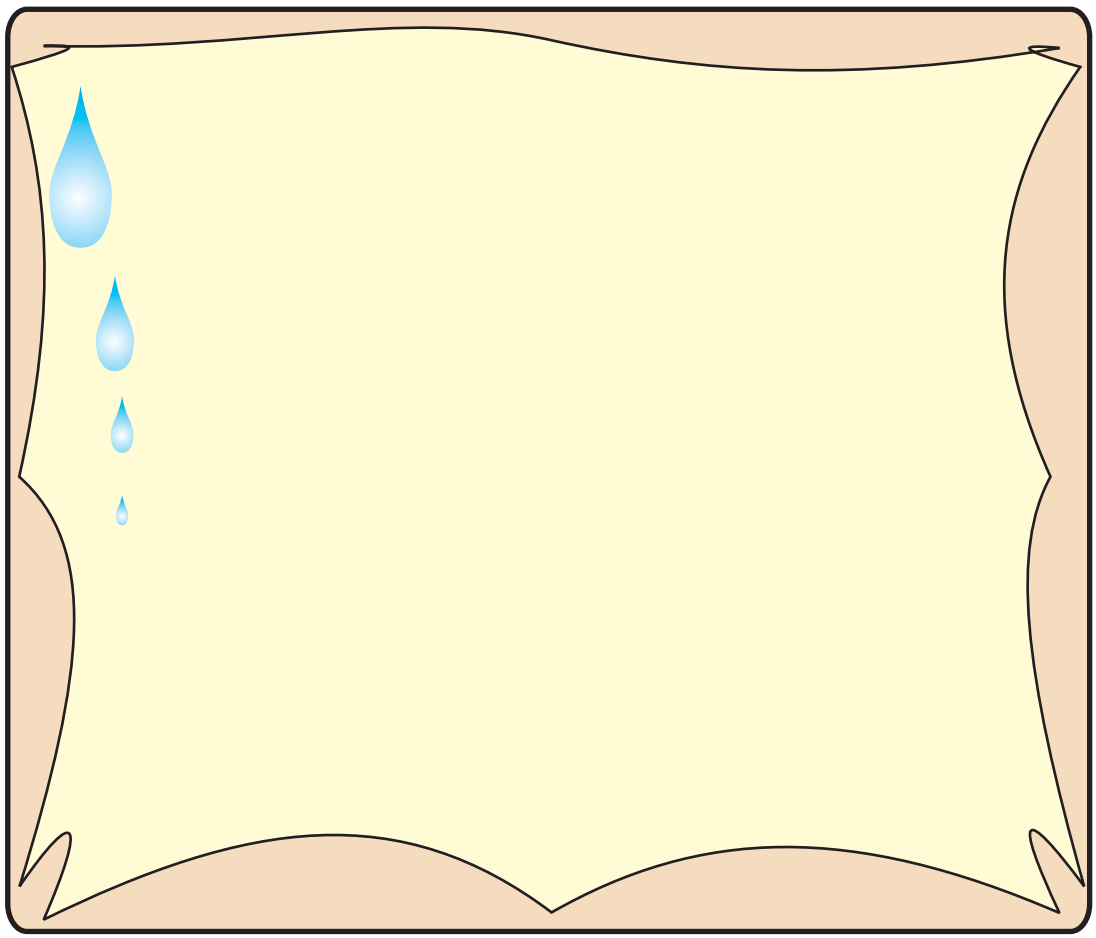
Usage	For one day (in litre)
Drinking	
Cooking	
To take bath, wash face, hands, legs.	
Washing vessels, clothes.	
Total amount of water	

Discuss in group whether water usage in your house is less in quantity, right quantity or more quantity.

SCIENCE

Activity

Write the methods to be followed in order to use water economically at home and in school.



CONSERVATION OF WATER

The need for water increases day by day. At the same time, the level of water in water resources are decreasing. In this situation, we must use water wisely.

Drinking contaminated water causes diseases like Cholera, Jaundice, Typhoid, etc. By drinking purified water, we can avoid diseases.

We must preserve drinking water from getting polluted.

How can we get purified / protected water?

1. We must drink water which is purified using certain amount of chlorine.
2. It is essential to drink water which is boiled and filtered.
3. Germs get destroyed by boiling the water. Drinking water vessels must be cleaned often.
4. Drinking water must always be closed with a lid.

Find out and write.

1. How many drinking water taps are there in your school?
2. Where does the stagnant water under the tap go?

Water is not seen in planets other than the Earth. So there is no life in other planets. So we should not waste water which is a very precious resource.

SAVE WATER !

SAVE EARTH !

Evaluation

(a) State whether True or False.

1. There will be drought if it rains heavily.
2. Water resources are decreasing day by day.
3. Chlorine is used for purifying the drinking water.
4. We should not wash very often the vessels in which we store drinking water.
5. Deforestation increases the rain.

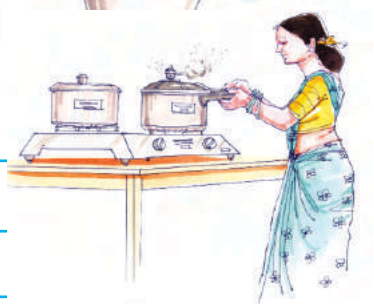
(b) Answer the following.

1. Name the diseases caused by drinking contaminated water.
2. What are the hazards of flood?
3. From where do you get drinking water?
4. What are the methods you follow to purify the drinking water?
5. What are the advantages of saving rain water?

(c) Look at the picture and write the activities in the ascending order based on the quantity of water required.







_____

_____

_____

3 SOLAR FAMILY

It is Science festival in Mohan's school.

One astronaut took part in that gathering.

Mohan shared all the information given by the astronaut through a letter to his friend.

Chennai,
_____

Dear friend….!

How are you? I hope you are working hard at your studies. I enjoy my science classes. Last week we had our school science festival. Our chief guest was an astronaut. I felt proud, that he was an Indian. He shared his experiences of being an astronaut. He talked about what he saw and experienced on his memorable space journey.

We asked him questions about the solar system. He explained about the solar system through a slide show. He answered all our questions patiently and clearly. He said, "You are the leaders of the future. So study well, and become great persons in the future." His speech was interesting and it has motivated me to become a great astronaut like him.

I am sending all the information he had given us along with this letter. Kindly share this with your friends.

With regards,

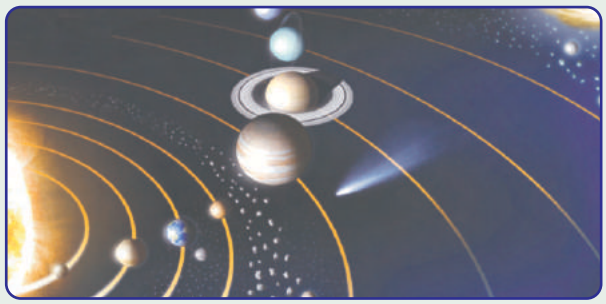
Yours lovingly,

K. Mohan

B. Ragul,
20, Ganapathy Nagar,
Velankanni-2.

SCIENCE

We can see numerous stars in a clear sky at night. The sun we see everyday is also a star and it is the nearest star to the earth. The planets revolve around the sun at different distances in different orbits. This is called solar system.



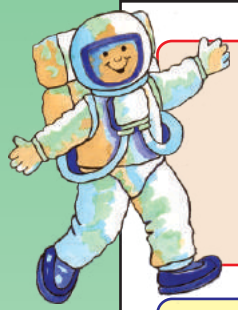
There are eight planets and many dwarf planets in the solar system. Pluto is one among the dwarf planets.

Mercury is the smallest and the nearest planet to the sun.

Venus is the second planet. It is very hot. It is the brightest planet.

The third planet is the Earth where we live. It has air and water. It supports life.

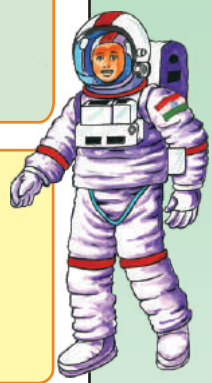
SCIENCE



Mars is the fourth planet. It is red in colour.

Jupiter is the fifth planet. It is the largest planet in the solar system.

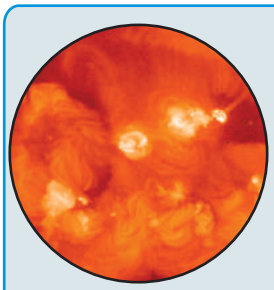
Saturn is the sixth planet. There are big rings around it.



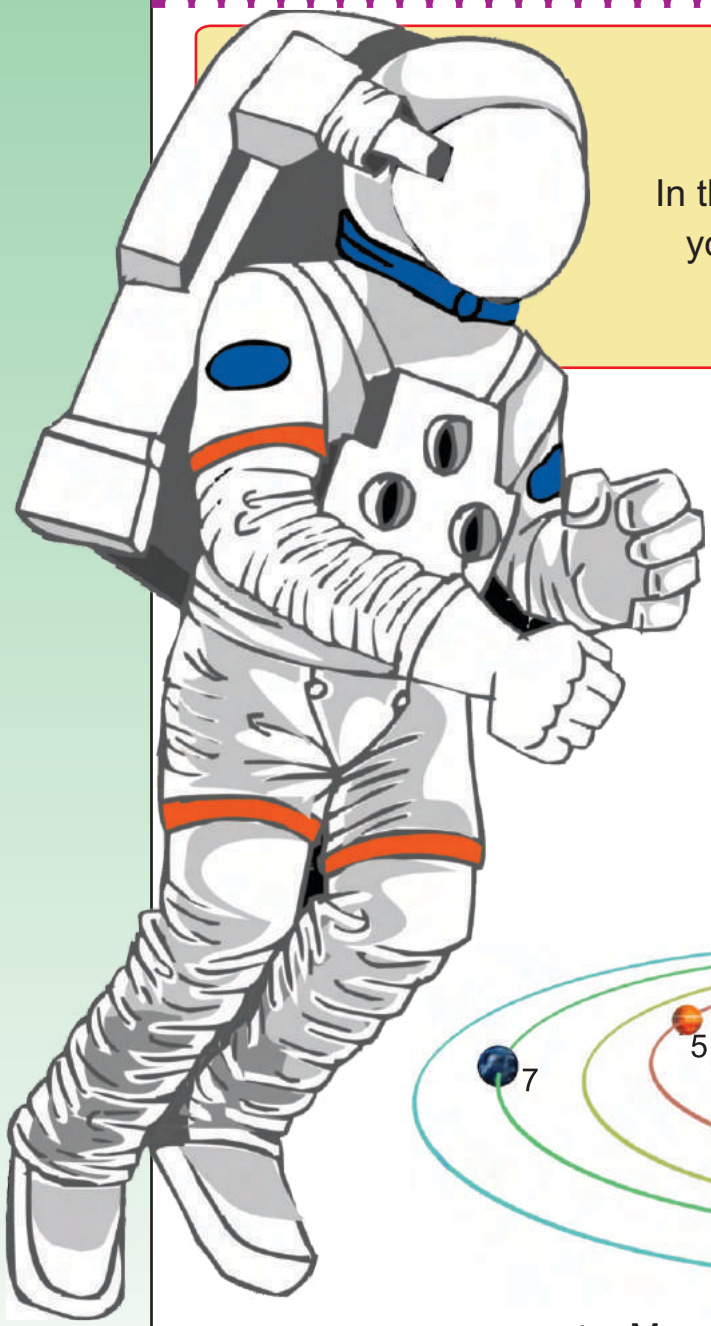
Uranus is the seventh planet. It is made up of gases. It also has rings. It is the coldest planet.

Neptune is the eighth planet. It is bluish green in colour and it is surrounded by clouds.

Upto 2006, Pluto was considered as the ninth planet. Since it does not have the properties of a planet, it is now regarded as a dwarf planet.



The sun is a ball of fire. It is very hot. Living organisms cannot exist on the earth in the absence of the sun.



You are an astronaut !

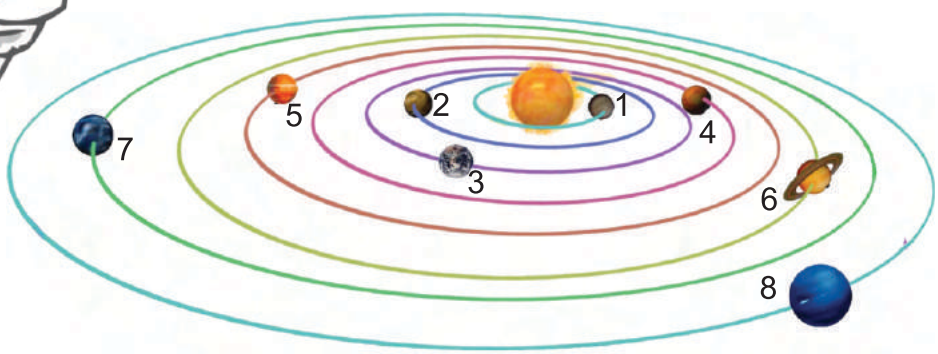
In the given astronaut's picture, stick your photographic face and enjoy seeing you as an astronaut.

Do you know?

The planet Pluto which was removed from the solar system was named by a girl called Venachia in 1930. At that time she was 11 years old.

Venachia is of _____ age now.

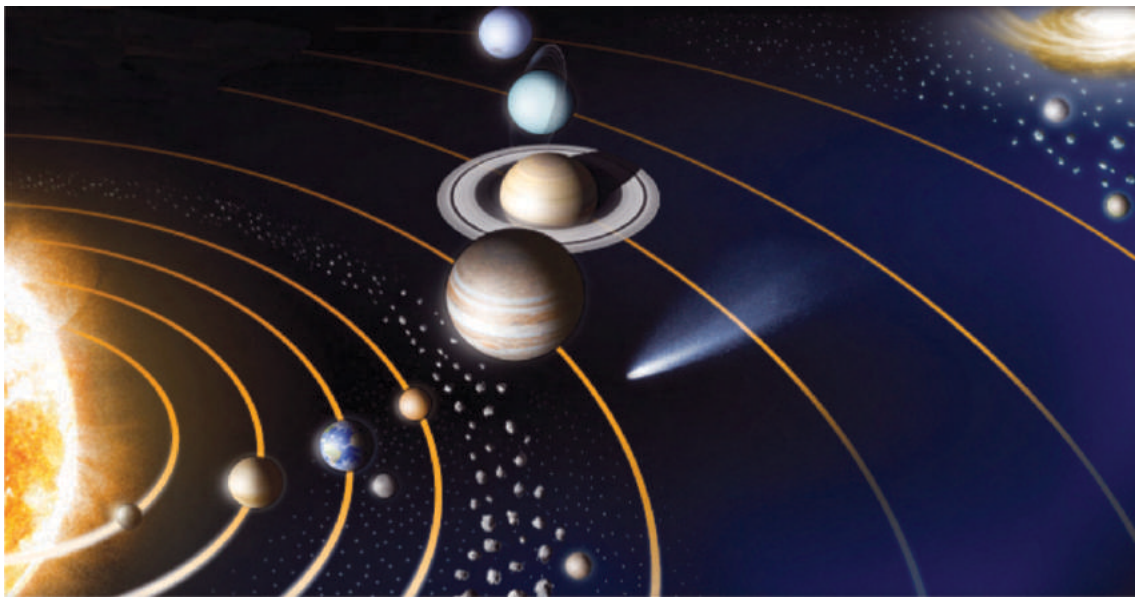
Solar System



1. Mercury 2. Venus 3. Earth 4. Mars
5. Jupiter 6. Saturn 7. Uranus 8. Neptune

Activity

Look at the picture and write the names of the planets.



Mercury is the nearest planet to the Sun.

4th Planet _____ 5th Planet _____

7th Planet _____ 2nd Planet _____

3rd Planet _____ 8th Planet _____

6th Planet _____

Do you know?

We can see planets such as Venus, Mars, Mercury, Jupiter and Saturn through our naked eye. Whenever such planet could be seen in the sky, it will be published in the newspapers. With the help of the elders try to see the planets.

Night sky

Normally what can be seen in the night sky?

- ✶ Name the instrument used by the child to observe sky.

_____

- ✶ What all can you see in the night sky?

Moon, Stars, Planets and meteors can be seen.

Since ancient times, man has been fascinated by the night sky. Sailors followed the position of the moon, the stars, the planets and the sun and they found the directions properly. Farmers could foresee the seasonal changes. As a result, they raise crops suitable to the season.

One can see some substances that give light and appear to fall towards the earth . What are they?

What are meteors?

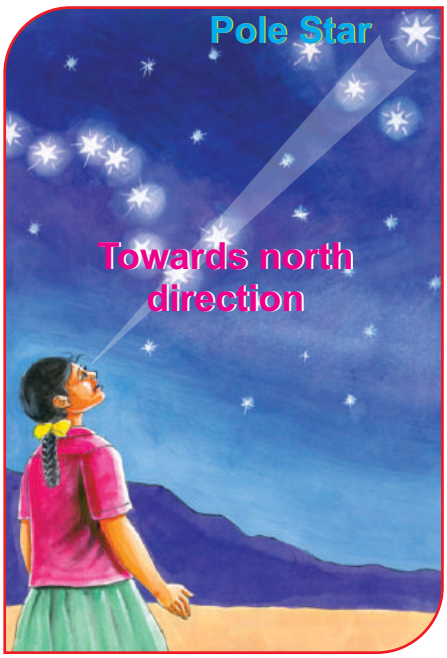
There are a number of asteroids in space. Sometimes they come towards the earth. As they come downward, it catches fire due to friction with the atmosphere. Such asteroids are called meteors.

Do you know?

Halley comet appears once in 75 to 76 years . Last time it appeared in 1986 and again it will appear in 2061 .It was discovered by Edmund Halley. It can be seen revolving round the sun by our naked eyes.

Pole Star

The brightest star that can be seen with our naked eye is the pole star. It can be seen in the northern direction.



Do stars have tail?

Comets are stars that have tails and they exist in the solar system. They are made up of gases. When it comes closer to the Sun the gases expand and appear like a tail. The tail will always be seen in the opposite direction of the Sun.

For Teachers...

Take the students for a field trip to the planetorium

Evaluation

(a) Observe the picture and answer the following.

1. Write the names of the planets in the solar system.
2. Which is the nearest planet to the sun?
3. Name the largest planet in the solar system.
4. Name the smallest planet in the solar system.

(b) State whether True or False.

1. Venus is the 3rd planet in the solar system.
2. The sun is a ball of fire.
3. There is no air and water on the earth.
4. Mercury is the nearest planet to the sun.

(c) Fill in the blanks with appropriate words.

1. There are _____(8/9) planets in the solar system
2. Sun is a ball of _____ (Fire / Ice)
3. Living organisms exist in the _____ (Uranus / earth)
4. The eighth planet in the solar system is _____ (Neptune / Mercury)

(d) Match the following.

1.	Jupiter	Sixth planet	☐
2.	Pluto	Nearest planet	☐
3.	Saturn	Largest planet	☐
4.	Mercury	Life exists	☐
5.	Earth	Dwarf planet	☐

(e) Write brief answers.

1. What is the solar system?
2. What is a comet?
3. Write a short note on meteors.
4. Write about the planet venus.
5. Write about the polestar.

Do you know?

Asia's largest telescope is in Tamilnadu. It is situated at Kavalur in Javathu Mountain in Thrivannamalai District. It is named as Vainubabu. Its diameter is 2.3 meter. It was designed and made in India in 1986 and a small planet was observed through this telescope in 1988. This planet is named 4130 Ramanujar.

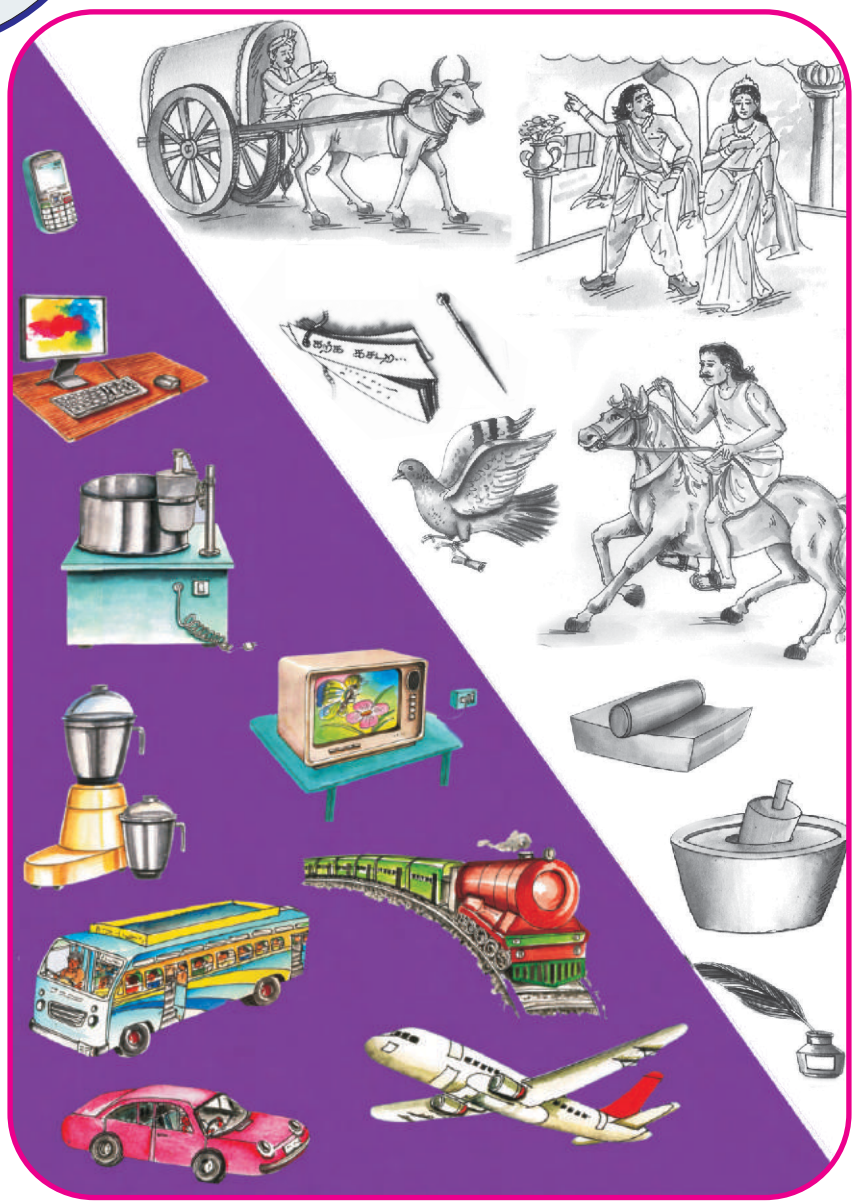
Do you know?

Manmade satellites are sent to space to revolve around the earth. India has launched its own satellite named as Indian National Satellite (INSAT). Since 1983, many satellites have been sent to space for communication and for environmental research purposes. In the year 2000, INSAT 3-B satellite was launched for the use of mobile phone. In 2004, satellite EDUSAT was launched for the students education. In 2007, INSAT 4CR was launched for DTH telecommunication and it is still in operation.

(INSAT) 3B

INSAT 4-CR

4 SCIENCE IN DAY-TO-DAY LIFE



Compare the two pictures.

How have the objects in the black and white pictures changed now?

On what basis have these changes taken place?

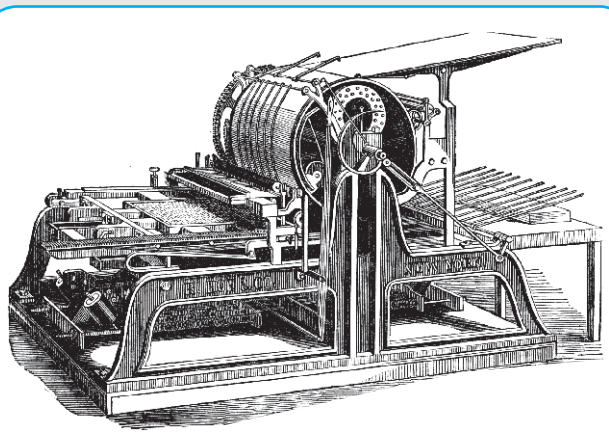
Do you know who invented the Television, the Telephone, Computer and Printing machine?

In ancient days, man observed nature and reflected. As his thinking capacity grew science also developed. He questioned the changes that happen in nature as Why? What? How? and When?. These questions led to the new inventions.

There are so many inventions by the time you open and close your eyes.

How were they invented?

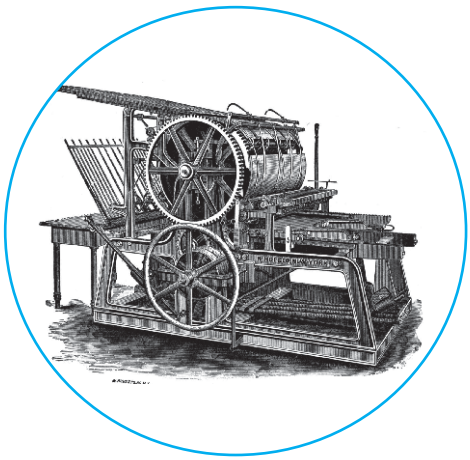
Scientists from their experience in life invented all these things. The printing machine is one among them.



PRINTING MACHINE

Where have you seen manuscripts and stone sculptures?

Which machine is used to make books, newspapers and textbooks?



First, man wrote on sand and clay. Then he carved on the stones. Later he used sharp pointers to write on palm leaves. He had to use a lot of time and effort. To make this work easier and faster a printing machine was required.

Johannes Gutenberg, a German, invented the printer.

Today, the printer has revolutionized the world.

Johannes Gutenberg was a goldsmith and a merchant. He lived in Main city in South Germany. He produced books out of the letters made of wood and metals in 1436. He is the inventor of the printing machine.

Johannes Gutenberg

Offset Printer

Activity

Find out the information about printing press which published your textbook.

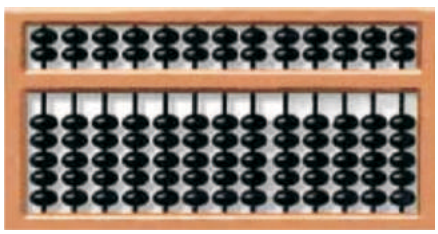
In which district in Tamilnadu is printing carried out extensively?

COMPUTER

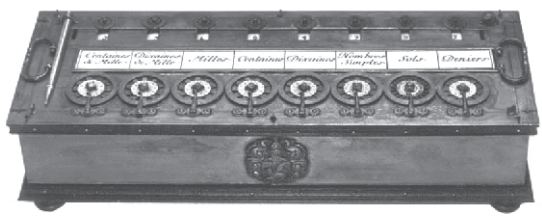
Man, right from his origin, used small stones, pebbles, small sticks, lines drawn on the wall, and his fingers to calculate. Then he formed numbers to calculate. Later he invented calculating devices operated by hand.

e.g. Abacus, Napier equipments, Pascal device, etc.,.

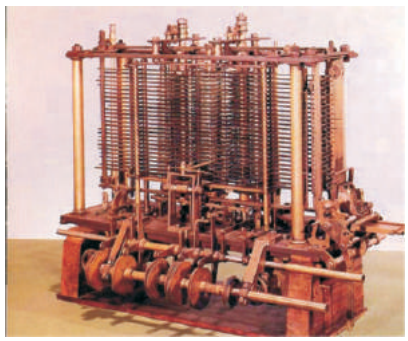
Charles Babbage invented Difference Machine in 1822. The principle of computer was already implemented in those days in this machine.



Abacus



Pascal device



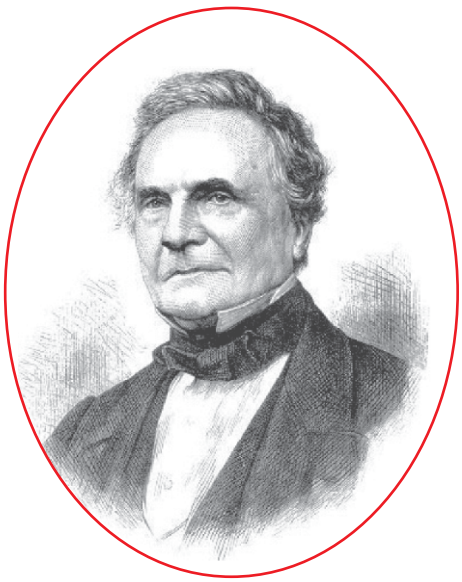
Difference machine

Napier equipments

He wanted the calculations to be error-free, faster and the calculated values to be stored and retrieved when needed. As a result computer was invented by him.

Charles Babbage designed the computers. Where have you seen the computer being used?

Computers are used in Departments of Defence, Education, Police, Research and Development, Health, Commerce, Communications, etc. Computer is used in all the fields throughout the world.

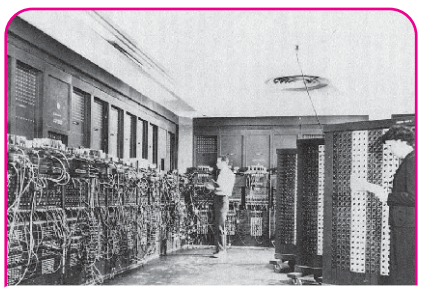


Charles Babbage

Charles Babbage was born in London in England in the year 1791. He did his higher studies in the Cambridge University in England. He was very much interested in Mathematics. He invented a device to calculate at a faster rate. This was the first computer. Apart from computer, he also invented speedometer and eye testing equipment.

The computer invented by him is very big in size. It can be found in London Science Museum even today.

In what way is a computer useful in your school?



First Computer designed by Charles Babbage

Latest Computer

Laptop

TELEPHONE

How will you send a message to your friend from Kanyakumari District to Trichy? Telephone has become very essential for long distance communication. Do you know how the telephone was invented?

Alexander Graham Bell

Telephone (old)

Telephone (New)

Cellphone

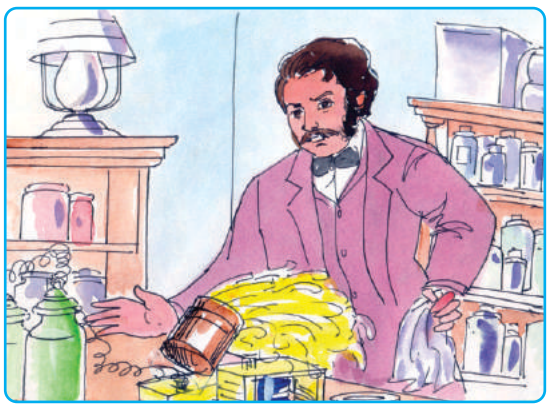
Alexander Graham Bell was born in Edinburgh city at Scotland in the year 1847. His mother was deaf. His father was a teacher for the deaf. Graham Bell had his elementary education only for 5 years.

He worked as a teacher for the deaf children. While he was teaching he started his research. Once he tried to send some messages through a wire. He did not succeed. However, he continued his research. As a result he succeeded in sending human voice through wire in 1876. The telephone was invented. His friend Watson helped him in his research. Do you know what was the first message spoken by Graham Bell in his telephone?

He said “Watson, come here. I want to see you”.

Do you know how the telephone was invented?

Graham Bell was working with sound carrying equipment in his Research Laboratory at Boston in America.



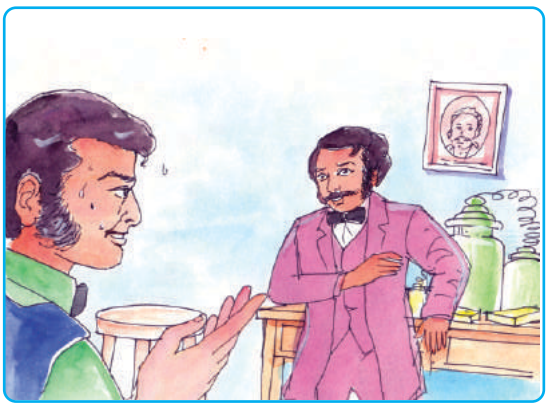
Accidently acid from the equipment fell on his dress.

Immediately he called his assistant "Watson."

"Watson. please come here."

Watson who was working in a room on the first floor was shocked to hear Graham Bell's voice through the equipment.

He immediately ran to the ground floor.



He entered Graham Bell's room and shouted. "The equipment is working".

This is how the telephone was invented.

Activity

Make a model of a telephone using matchboxes or paper cups.

SCIENTIFIC QUESTIONS

One day, Sir Issac Newton saw an apple falling down from a tree. At that time, he thought why the apple did not go up. That is how he was able to discover the gravitational force.

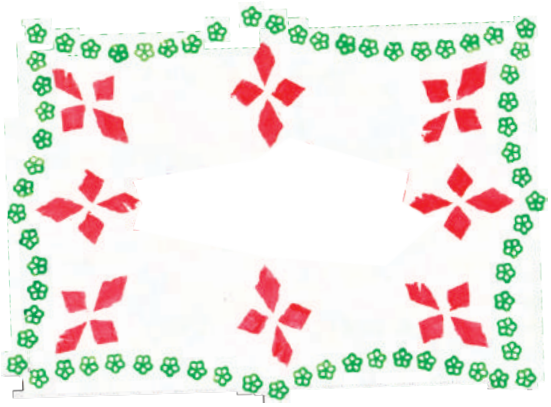
The question such as Why, What and How are called scientific questions.

- Do you know why the hind leg of a frog is long?
- What are the things attracted by the magnet?
- How are bees attracted towards flowers?

Observe the pictures. How many questions can you form out of these? List them.

Activity

Carve your name on a potato or carrot and apply ink and press it on a paper. Cut a lady's finger and apply ink on that and prepare greeting cards.



Evaluation

Answer in one or two words.

1. Who designed the printing press first? Which is his native land?
2. In what type of letters did Johannes Gutenberg write his book?
3. Write any three uses of the printing press.
4. Write any two equipments used to calculate with hands.
5. Name the equipment designed by Charles Babbage.
6. Which country did Charles Babbage belong to? In which University did he do his higher studies?
7. Write any two uses of computer in your school.
8. When was the telephone invented?
9. Name Graham Bell's friend who helped him in his research.
10. What do you mean by scientific question?

'I can, I did'

Student's Activity Record

Subject:

Sl.No	Date	Lesson No.	Topic of the Lesson	Activities	Remarks