



**SCIENCE**  
**STANDARD FIVE**  
**TERM III**

## What do these Icons stand for!



Fact



Do you know?



Think it over



Evaluation



Do and observe / Activity / Experiment



For your attention



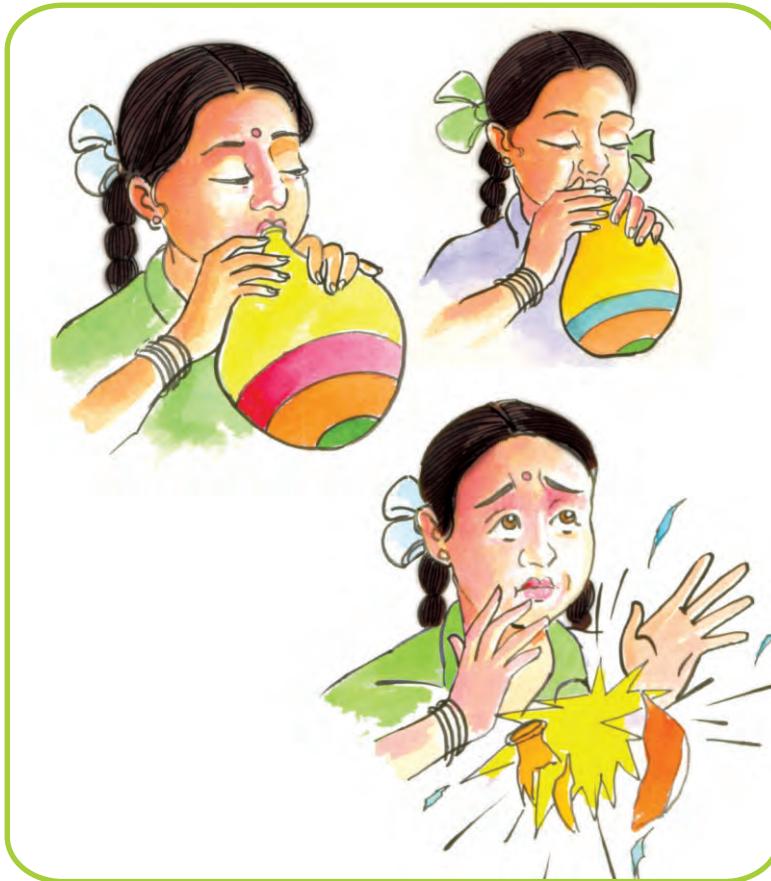
Project



Assignment



## 1. Air



A village festival: Elackia and Mala are sisters. They live in a village. Their grandmother came for the village festival. She purchased balloons for them. They were very happy and blew the balloons bigger and bigger, competing with each other. Suddenly, Elackia's balloon burst. She was disappointed. Why did the balloon burst? What happened to the air inside the balloon? She wondered. Along with Elackia, shall we find out?

Look at the examples given below and list a few more objects that are filled with air.



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## Properties of air

Shall we learn about the properties of air by doing a few experiments?

### Experiment 1

**Materials needed :** Two balloons, 12 inches long stick, thread and a pin.

#### Procedure :

Tie a piece of thread in the middle of the stick.

Tie two balloons filled with air at both ends of the stick as shown in the figure. Hold the stick with the help of the thread like a balance. What do you observe?

Prick one of the balloons with a pin. What do you observe now?

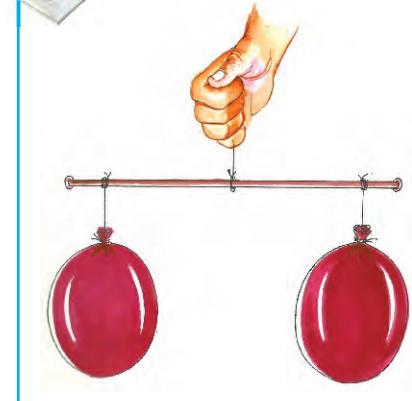
S. No.	Experiment Stage	Observation
1.		Balloons are balanced. The stick is straight.
2.		The end of the stick with filled balloon goes down while the end with the deflated balloon rises up .

#### Reason :

1. Both balloons have equal quantity of air.
2. Balloon filled with air is heavier than the deflated balloon.

#### Conclusion :

This experiment shows that air has weight.





## Experiment 2

**Materials needed :** A glass tumbler, a square piece of cardboard (as shown in the figure) and water.

### Procedure :

Take the glass tumbler and fill it with water upto the brim. Hold it with your left hand. Close the mouth of the tumbler with a cardboard and press it with your right hand. Holding the cardboard firmly with your right hand, invert the tumbler. Now carefully remove your right hand.



S. No.	Experiment	Observation
1.		_____ _____ _____
2.		_____ _____ _____

### Reason :

The cardboard does not fall even if the right hand is removed from it due to the pressure of air.

### Conclusion :

This experiment shows that air exerts pressure.



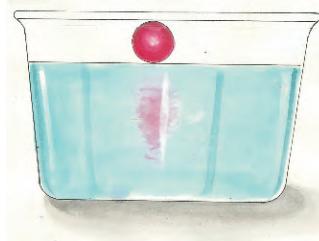
## Experiment 3



**Materials needed :** Empty jar, a light weight ball, pieces of paper, a glass tub filled with water.

### Procedure :

- Keep a light-weight ball floating on the surface of water in the glass tub.
- Fix pieces of paper inside the jar at the bottom.
- Hold the mouth of the jar over the floating ball and press it down till the mouth touches the base of the tub.



### Observations :

- Water did not enter into the jar.
- The pieces of paper fixed inside the jar at the bottom did not get wet.
- The ball which was floating is now at the bottom.

### Reason :

The air present in the jar did not allow the water to enter into the jar.

### Conclusion :

This experiment shows that air occupies space.



## Do and observe



Keep a lighted incense stick at the corner of your house.

What do you observe after a few minutes?

The smell of incense fills the entire house.

Air spreads in all directions.



## Uses of gases present in air

- We know that air is a mixture of nitrogen, oxygen, carbon dioxide and inert gases like neon, argon, crypton and xenon. Oxygen is essential for the survival of all living organisms. When we breathe, we inhale oxygen and exhale carbon dioxide. People who climb mountains, those who dive into the deep sea and the researchers going to space all carry cylinders filled with oxygen in order to breathe.



- Carbon dioxide is used during photosynthesis in plants. It is used in aerated drinks. Solid carbon dioxide (dry ice) is used as a freezing agent.
- Nitrogen is used as natural manure.
- Inert gases (neon, argon, crypton, xenon) are filled in bulbs which give bright coloured lights.

## Windmills

Windmills use wind to generate electricity. Large number of windmills have been erected in places like Aralvaimozhi and Kayatharu for generation of electricity.





## Applications of Air pressure in our daily life

- To fill medicine in injection syringes.



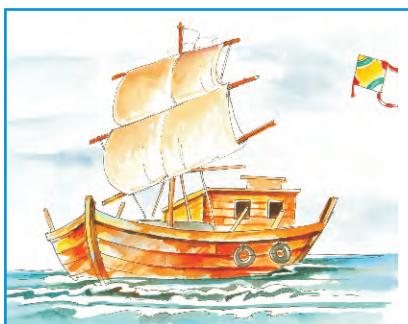
- To fill ink in pens.

- To suck cool drinks using a straw.



- To construct artificial fountains.

- To operate hand pumps.



- For the working of sail-boats, parachutes and kites.

Name other things that work by air pressure.

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## EVALUATION



### I. Choose the right answer:

1. The gas that is largely present in air is \_\_\_\_\_  
a) Hydrogen                          b) Nitrogen  
c) Oxygen                              d) Carbon dioxide
2. The gas used for respiration of living things is \_\_\_\_\_  
a) Nitrogen                            b) Oxygen  
c) Inert gases                        d) Carbon dioxide
3. The gas used in photosynthesis is \_\_\_\_\_  
a) Inert gases                        b) Oxygen  
c) Nitrogen                            d) Carbon dioxide

### II. Fill in the blanks:

1. Air has \_\_\_\_\_.
2. Windmills are found in large numbers at places like \_\_\_\_\_ and \_\_\_\_\_.
3. The gas used for the production of manure is \_\_\_\_\_.
4. \_\_\_\_\_ and \_\_\_\_\_ work on the principle of atmospheric pressure.

### III. State whether true or false:

1. Air pressure is used to form artificial fountains.
2. Air does not exert pressure and has no weight.
3. Air occupies space.
4. Air can spread everywhere.
5. We use carbon dioxide for respiration.



#### IV. Match the following :

- |                         |                     |
|-------------------------|---------------------|
| 1. Nitrogen             | a) Electricity      |
| 2. Atmosphere           | b) Decorating lamps |
| 3. Windmills            | c) Natural manure   |
| 4. Inert gases          | d) Hand pump        |
| 5. Atmospheric pressure | e) Blanket of air.  |

#### V. Answer in one or two sentences :

1. Define atmosphere.
2. Why do people who climb mountains carry oxygen cylinders?
3. State any two properties of air.
4. Name the places where windmills are found in Tamilnadu.

#### VI. Answer in detail :

1. What are the applications of air pressure in our daily life?
2. Prove that air has weight by an experiment.
3. Prove that air exerts pressure by an experiment.
4. Show by an experiment that air has the property to occupy space.

#### VII. Project:

Make models of parachute, kite, hand fan, sailing-boat, aeroplane and windmill.





## 2. Water



SCIENCE

Simon walked happily in the rain. He was drenched. He looked up at the sky. Rain drops were falling ... Countless drops from the sky? He wondered where they are stored in the sky! How did it get there? He ran to his mother to find answers to his questions.



His mother took him to the kitchen and asked him to observe water boiling in a vessel. She pointed out how water transforms into vapour. She closed the vessel with a plate. After some time she removed the plate from the vessel. There were water drops on the plate.



In the same manner, water from the surface of water bodies like rivers, lakes, pools and oceans evaporates due to the heat of the sun. Then they form into clouds. When the clouds get cooled, rain drops are formed.

### Shall we discuss the following facts with our friends?

- When wet clothes are dried, what happens to the water in them?  
Where does the water go ?
- How does the mopped floor get dry ?
- How do washed vessels get dry ?

### Observation

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#### Evaporation

The process of water changing into vapour due to heat is called evaporation. It takes place at all temperatures.

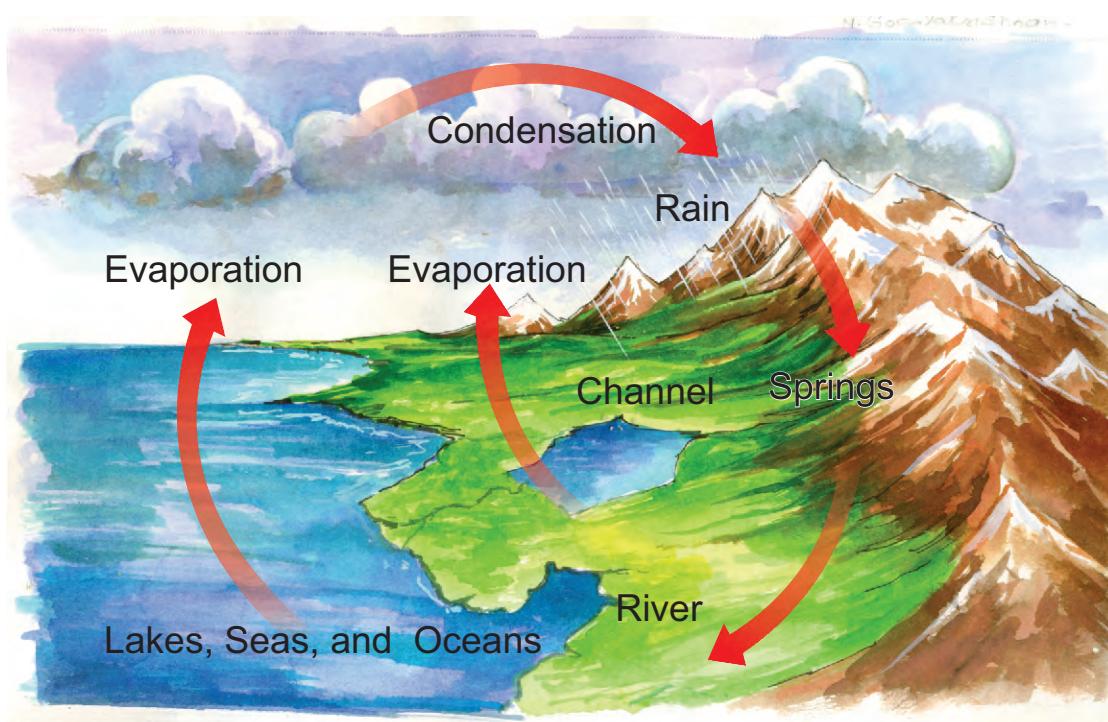


We get salt from sea water by evaporation.



## Water cycle

Due to the heat of the sun, the water on the surface of rivers and seas evaporates. Where does this evaporated water go ? What happens when it gets cooled ? Look at the figure below and find out how rain is formed.



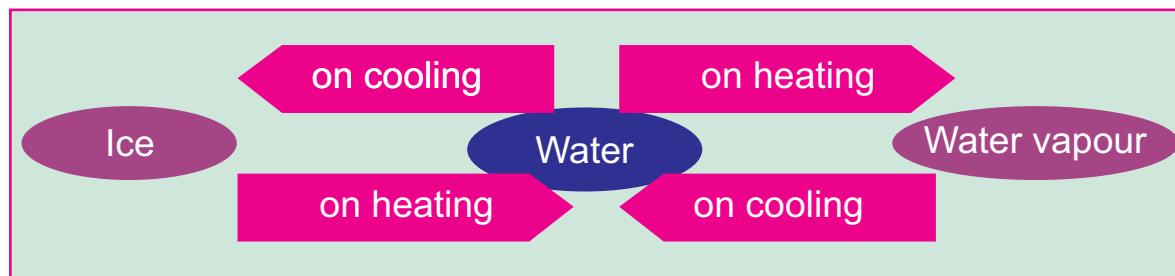
Due to the sun's heat, water on the earth evaporates and forms into rain clouds. When these clouds are cooled, they fall on the earth as rain. This process is called water cycle.



## The three states of water

Water is found in three states.

1. Solid state - Ice
2. Liquid state - Water
3. Gaseous state - Water vapour



Pure water is a liquid; it is colourless, tasteless and odourless under normal conditions

### Fact

When the clouds are super cooled, the rain drops freeze to ice and fall as hail-stones.



### Think it over



Whitewashing work was going on in Simon's house. Simon was observing the painter mixing quick-lime powder with water.

After some time, he observed that the powder formed a precipitate in the bucket. Meanwhile Simon's mother brought him a glass of milk. She added sugar to the milk, mixed it and gave it to Simon to drink. When Simon tasted the milk, he found it sweet. He noticed that all the sugar had dissolved in the milk. Why did the quick-lime powder not dissolve in the water, whereas the sugar dissolved in the milk? What is the reason for this?

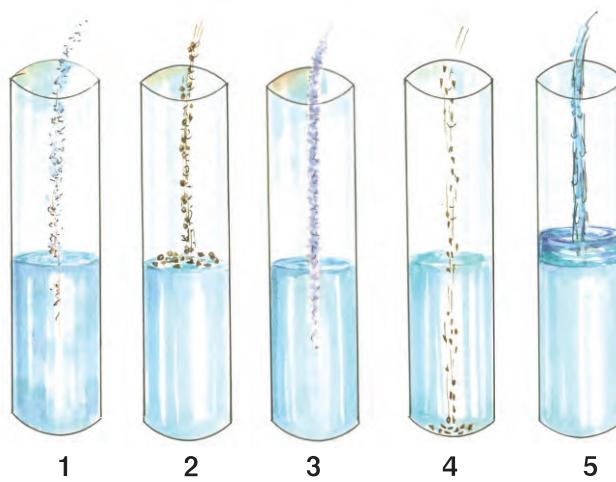


## Do and observe

Take five test tubes. Fill half of each test tube with water.



Add a little sugar to the first; sawdust to the second; salt to the third ; baking soda to the fourth and coconut oil to the fifth test tube. Do all these substances dissolve in water? Note down your results in the tabular column given below.



Things	Dissolve / Does not dissolve
Sugar	_____
Saw dust	_____
Salt	_____
Baking soda	_____
Coconut oil	_____

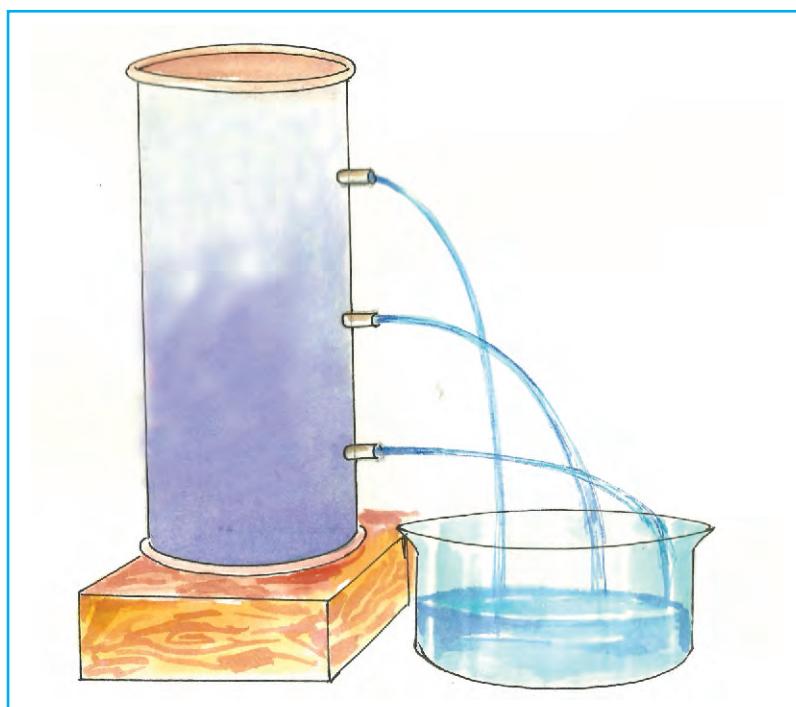
## Water - a universal solvent

Most of the substances dissolve in water, but only some substances do not dissolve in water. Hence water is called a **universal solvent**.



## Do and observe

Take a cylindrical vessel. Make three holes of the same size, as shown in the figure. Close the holes with pieces of cork. Fill the vessel with water and place it on a box. Open the holes simultaneously.



From which hole does water fall closest to the box ?

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From which hole does water fall farthest from the box ?

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What is the reason for this difference ?

Water exerts pressure. Water pressure increases with depth.



## Water - A common resource for all

“The world cannot exist without water”, - Thiruvalluvar. Water is the basis of life. Human civilization grew only along the river belts.

Though the earth is mostly covered by water, potable water available is meagre. Of all the water resources available on the earth, 97.3% is from the sea. Of the remaining 2.7%, only 1% water is available for human consumption as drinking water.

Water is a wonderful gift of nature. For human consumption water is available from rivers, ponds, lakes, wells and underground water belts. Rain is the basic source for all these water bodies. In ancient times, people considered the free distribution of water to be a noble service.

All the natural resources of the earth are inter-linked. If any one of them is affected, it affects the entire life on earth.

In future, the nation with good water resources alone would be considered fully developed.

Water resources do not belong to any individual person, race or state or nation. It is common to all living beings. No one can own the air, sunlight and water.

Look at the clouds. They float all over the sky above the earth. The water we get from clouds is common to all. So, “water for all” is to be our slogan.

### Do you know?

March 22 is celebrated as world water day.



### For your attention



Don't waste water in schools, houses and road side taps

Save water - Saving water is our duty.



## EVALUATION

### I. Choose the right answer :

1. The World Water Day is \_\_\_\_\_  
a) March 22      b) April 22      c) May 22      d) August 22
2. \_\_\_\_\_ is a natural resource  
a) aeroplane      b) plastic      c) water      d) fan
3. \_\_\_\_\_ is a universal solvent  
a) milk      b) water  
c) kerosene      d) lemon juice
4. The gaseous form of water is \_\_\_\_\_  
a) gas      b) water vapour      c) ice  
d) water
5. Human Civilization grew only along the \_\_\_\_\_  
a) seashore      b) river belts      c) forest      d) home

### II. Fill in the blanks :

1. The solid state of water is \_\_\_\_\_.
2. \_\_\_\_\_ is the basic source of water.
3. Distributing water as charity is a \_\_\_\_\_.
4. Water is a \_\_\_\_\_.

### III. State whether true or false :

1. Water becomes ice due to the sun's heat.
2. The very basis of life is water.
3. Water scarcity is caused by the destruction of water bodies.
4. It is our duty to save water.
5. Evaporation takes place at all temperatures.



#### IV. Answer in one or two sentences:

1. What is called evaporation?
2. What are the three states of water?
3. Water is a universal solvent? Explain.
4. State any two properties of water
5. How are rain drops formed?
6. Why does it take long time to dry clothes during the rainy season?

#### V. Answer in detail:

1. Water is common to all. Explain.
2. Water exerts pressure. Prove it with an experiment.



### 3. Space Travel



It was a summer night. Tharanya had had her supper and ran towards her grandfather's cot. The cot was kept on the verandah. She lay on the cot and gazed at the beautiful night sky, twinkling stars, and the shining moon. The sky at night was beautiful. While she was admiring the sky, an aeroplane flew past. Soon after she fell asleep and dreamt. The next morning she went to the school. During the first period, the Science teacher asked the students about their dreams for the future. Each one shared his / her wishes.



Tharanya said, "Sir, at least once, I want to fly in the sky in the plane. I want to touch the twinkling stars and moon. I want to go around the moon. I would like to fly higher and higher to see what is above the sky".

He praised Tharanya for her desire to explore and he related some basic information on space travel.



SCIENCE

## Space Research

The place above the atmosphere is called space. Numerous constellations, planets and particles are found in space.

In 1957, Russia sent the first satellite called Sputnik.

The body moving in an orbit around a planet is called a Satellite.

Artificial satellites are man-made objects which revolve around the earth.



## Do and observe – Rocket



Things needed: Chart paper, Colour papers, Gum and Cello tape.

**ISRO** is the Indian Space Research Organization. It was established in **Bangalore** in 1969.

The rocket launching pad in our country is at **Sriharikotta** in Andhra Pradesh. From here satellites are launched.

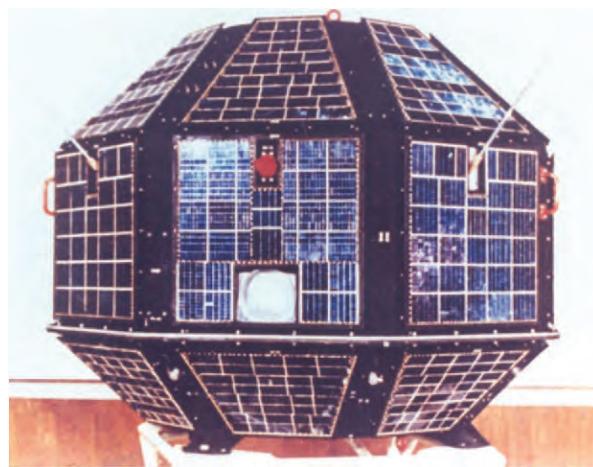


Rocket Launching Pad - Sriharikotta

The space research centres in our country have launched many satellites. The satellite Aryabhatta from India was launched in 1975. India is one of the leading countries in space research.

**Aryabhatta** and **Baskara** are the famous astronomers who lived in India centuries ago.

The vehicle which takes the satellite to space is called **a rocket**.



Aryabhatta Satellite (1975)



The first dog which was taken to space was called **Laika**. Likewise, animals like **monkey, rat, cat, frog, spider, tortoise** have been taken to space for research purpose.



Men have travelled in space. **Yuri Gagarin** of Russia was the first man to go to space in **1961**.



**Yuri Gagarin**



Rakesh Sharma



Sunitha Williams

Rakesh Sharma was the first Indian to go to space in 1984.

Women astronauts, like Kalpana Chawla and Sunitha Williams have also gone on space missions. It is a matter of pride for us that both these astronauts are of Indian origin.

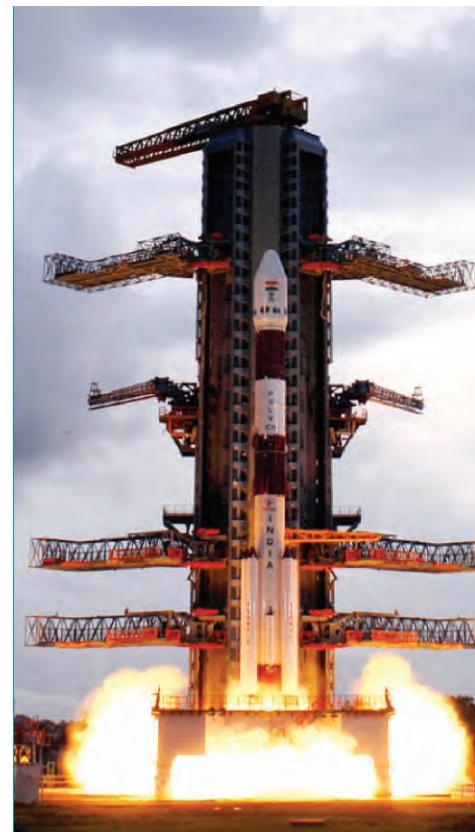


Kalpana Chawla

Man has visited the moon. Three American astronauts Neil Armstrong, Edwin Aldrin and Michael Collins travelled to the moon successfully. Neil Armstrong and Edwin Aldrin set foot on the moon on 20th July, 1969.

India also has a plan of sending man to the moon. As a preparation , on October 22, 2008. India launched a satellite Chandrayan 1. This satellite has found water on the surface of the moon.

The basic motivation behind launching Chandrayan 1 is to widen our knowledge of the moon which is the one and only natural satellite of the earth. Various satellites from different countries have been sent not only to the moon but also to other planets for research purposes.



Chandrayan 1



## Fact

The Moon takes 27.32 days for one rotation on its axis. The Moon takes the same duration of time to go around the earth. Hence, we can see only one side of the moon from the part of the earth where we are.

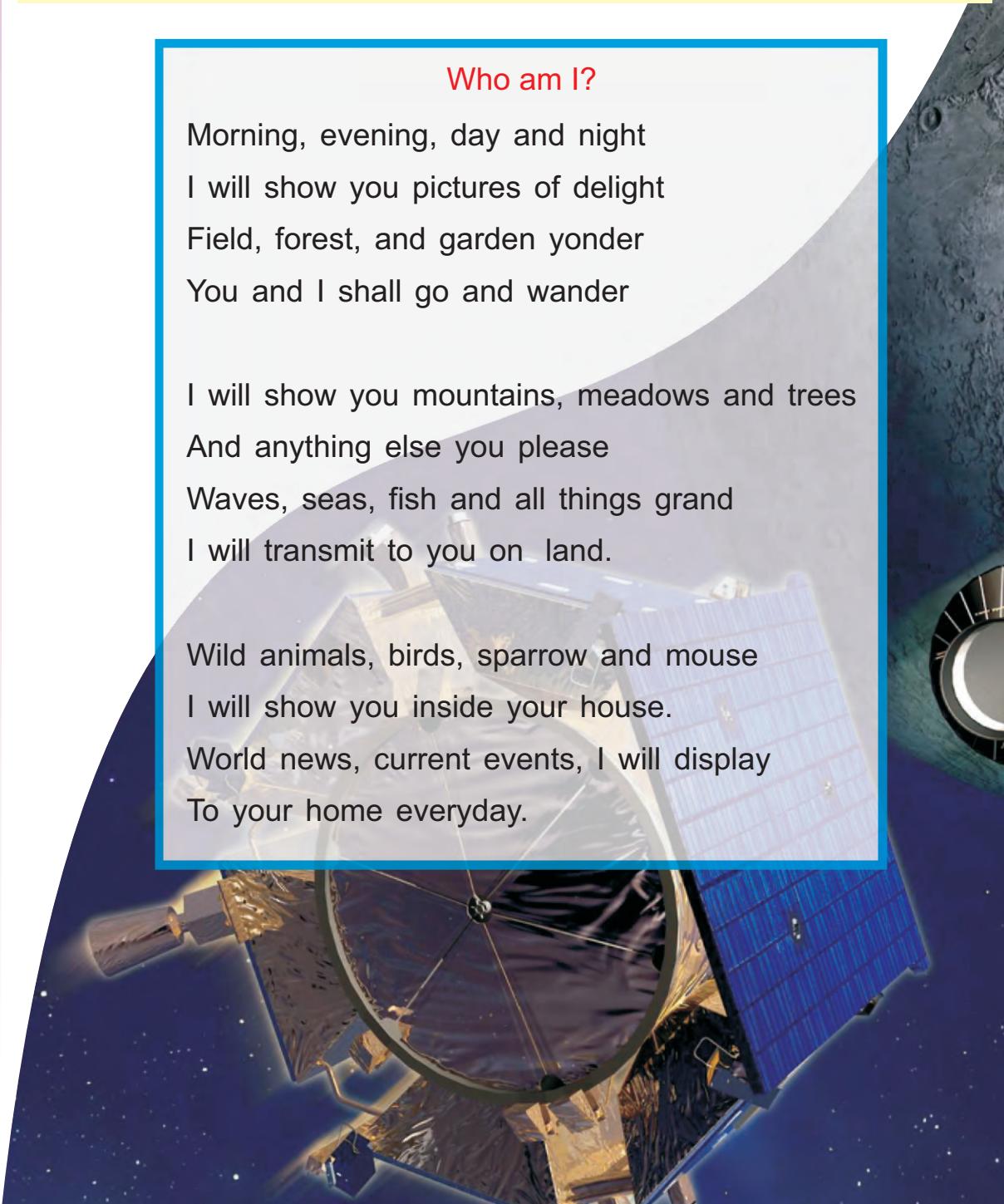


### Who am I?

Morning, evening, day and night  
I will show you pictures of delight  
Field, forest, and garden yonder  
You and I shall go and wander

I will show you mountains, meadows and trees  
And anything else you please  
Waves, seas, fish and all things grand  
I will transmit to you on land.

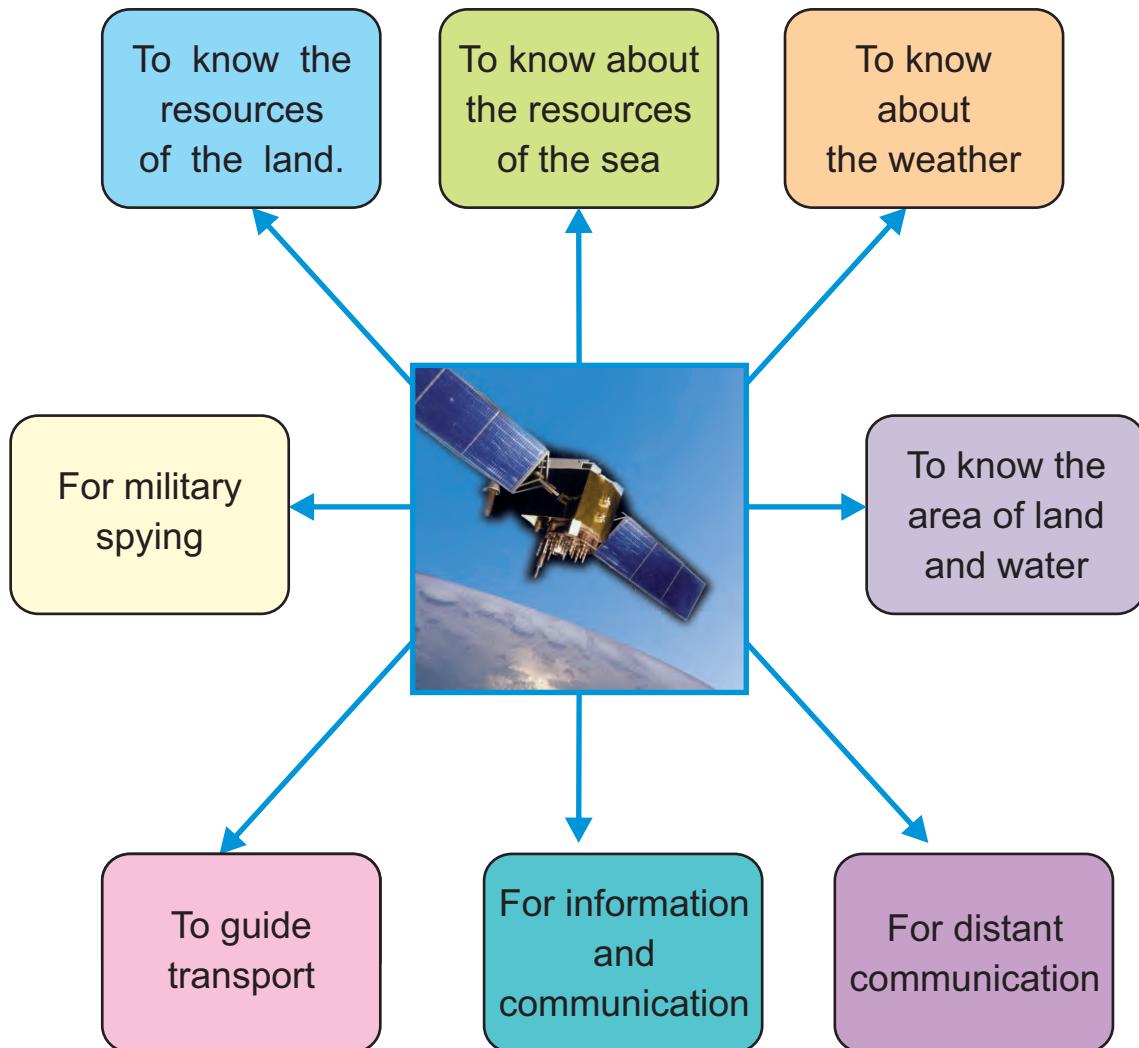
Wild animals, birds, sparrow and mouse  
I will show you inside your house.  
World news, current events, I will display  
To your home everyday.





Now so many satellites revolve in space.

- Why are there so many satellites ?
- Do you know their uses ?



Let us also dream like Tharanya and realize our dreams.



## EVALUATION



### I. Choose the right answer :

1. The first astronaut who travelled to space
  - a) Yuri Gagarin
  - b) Baskara
  - c) Neil Armstrong
  - d) Kalpana Chawla
2. The year in which the first satellite was sent from India
  - a) 1969
  - b) 1957
  - c) 1975
  - d) 1956
3. Where is the rocket launching pad in our country?
  - a) Kalpakkam
  - b) Chennai
  - c) Sri Harikotta
  - d) Delhi
4. The vehicle which carries a satellite is
  - a) Car
  - b) Train
  - c) Plane
  - d) Rocket
5. The first satellite launched to space was
  - a) Baskara
  - b) Aryabhatta
  - c) Sputnik
  - d) Chandrayan.

### II. Fill in the blanks :

1. Indian Space Research Organization is in \_\_\_\_\_.
2. The first Indian who travelled to space was \_\_\_\_\_.
3. The first woman of Indian origin who went to space was \_\_\_\_\_.
4. Aryabhatta was launched to space in the year \_\_\_\_\_.
5. The country which launched the satellite Sputnik, was \_\_\_\_\_.

### III. State whether true or false :

1. Chandrayan1was the first satellite sent to the moon.
2. Rakesh Sharma was the first man who went to space.
3. First Indian satellite was sent in the year 1975.
4. Satellites are used for distant communication.
5. Indian Space Research Organization is in Delhi.



#### IV. Match the following :

- |                   |         |
|-------------------|---------|
| 1. Sputnik        | a) 1961 |
| 2. Yuri Gagarin   | b) 1969 |
| 3. Aryabhatta     | c) 2008 |
| 4. Neil Armstrong | d) 1957 |
| 5. Chandrayan 1   | e) 1975 |

#### V. Answer in one or two sentences :

1. What is a satellite?
2. Write a short note on space.
3. Mention the names of a few astronauts .
4. What is a rocket?
5. Mention the names of a few Indian astronomers.

#### VI. Answer in detail :

1. What are the uses of satellites?



#### VII. Assignment :

1. Collect interviews of some astronauts .



#### VIII. Project work :

1. Collect pictures and information of satellites.
2. Write the life history of any two astronauts.



## 4. Scientists

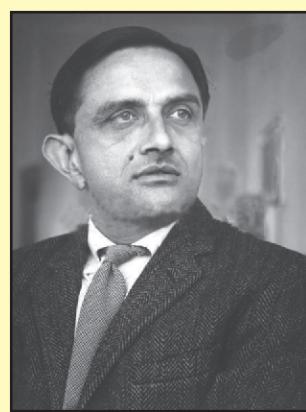
### Vikram.A.Sarabhai

Today we enjoy science from the comfort of our home. We can watch the world news, cultural programmes, recreational programmes, sports and the climatic conditions through television, can't we?

Likewise, the nation's water, land, mineral and ocean resources, defence, military intelligence and communication are well developed because of artificial satellites. Shall we learn about Vikram . A. Sarabhai who sent satellites to space to create a new era of research in Astrophysics in India?

He was born on 12th August 1919 in Gujarat. From his school days he showed aptitude towards science and mathematics. Later he went into space research. He was involved in the construction of the Thumba Rocket Launching Station near Thiruvananthapuram.

Name	:	Vikram.A.Sarabhai (Vikram Ambalal Sarabhai)
Birth	:	12th August 1919
Place of birth	:	Ahmedabad, India
Death	:	30th December, 1971 in Kerala,India
Work station	:	Indian Space Research Centre
Guide	:	Sir. C.V.Raman
Awards	:	Shanthi Swarup Bhatnagar Award(1962) Padmabhooshan Award(1966) Padmavibhushan Award(posthumously in 1972)



Vikram. A. Sarabhai



## Achievements:

He designed the Aryabhatta satellite and sent it to space. This genius who got name and fame for our country on a par with the developed nations of the world is none other than Vikram.A.Sarabhai.

He established Sarabhai Physics Research Station and Indian Space Research Institute. He was also responsible for making our country excel in space research.

He also did research in cosmic rays. He had discovered that cosmic rays coming from space reach the earth. He explained that the changes which took place among the planets are reflected by these cosmic rays. He made this fact known to the world. His aim was to make everyone understand science easily.

His experiment on “the satellite industrial television” was successful. Because of his discovery about 5 million people in 2400 villages in India were able to enjoy a variety of television channels. He died at the age of 52.

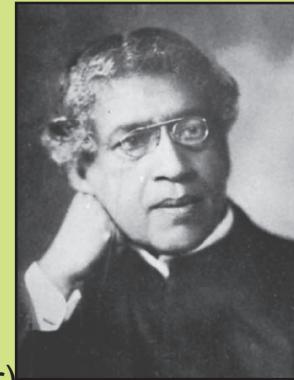
## Sir Jagadish Chandra Bose

Do you think that only people have life and feelings? Can only people hear and enjoy music, feel heat and cold ? “Like you, we also have all these sensations” say the plant community. Shall we learn about Sir Jagadish Chandra Bose who discovered this fact and made it known to the whole world?”



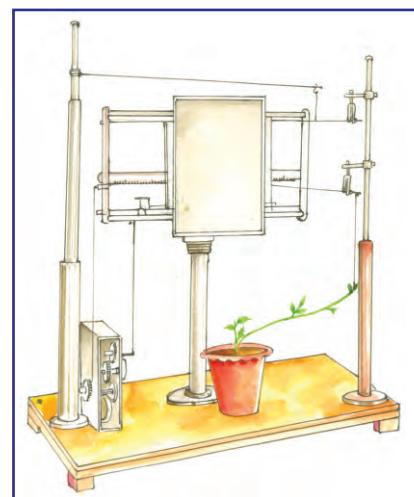
He was born on 30th November 1858 at Mymensingh in Dhaka.

Name	:	Jagadish Chandra Bose
Birth	:	30th November 1858
Place of birth	:	Mymensingh, Bengal
Death	:	23rd November 1937 Bengal, India.
Work station	:	Presidency College, Kolkatta (Physics Professor)



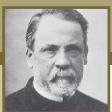
## Achievements

- He was involved in Radio waves research. He discovered and proved that electricity can be sent to space as electromagnetic waves without wire.
- Marconi invented the Radio with the guidance of the electromagnetic waves invented by J.C.Bose.
- He invented KOHAR, an instrument to detect radio waves. He invented a wonderful **Crescograph** instrument named Crescograph which can trace the micro-sensations of plants.



To honour him for his achievements, the British government knighted him in 1917 and this earned him the title of 'Sir'. He died on 23rd November 1937.

The Bose Institute at Kolkatta still continues his work on plant research.



## Louis Pasteur

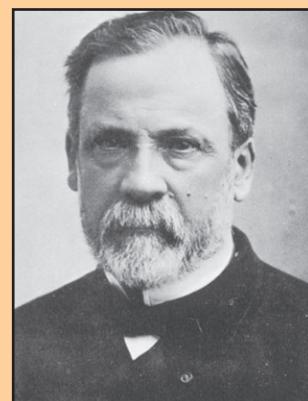
He is an important scientist of chemistry and microbiology. He discovered the anti-rabies vaccine and played a vital role in the field of medicine. Shall we learn more about this great person?

### Achievements

- He discovered the Anti-Rabies Vaccine
- He discovered the Pasteurization method of preserving milk.
- He established the fact that the curdling of milk and fermentation are caused by micro-organisms
- He discovered different methods of food preservation.
- He made known the fact that some micro-organisms can live without oxygen (anaerobes).
- He discovered various techniques for prevention of diseases.

So he is known as the "**Father of Microbiology**"

Name	:	Louis Pasteur
Birth	:	27th December, 1822
Place of birth	:	Francistole, France
Death	:	28th September, 1895 in France
Work station	:	University of Strasbourg, France.



**Louis Pasteur**



Shall we complete the table!

S.No	SCIENTIST'S NAME	INVENTION / DISCOVERY
1.	Sir Isaac Newton	Gravitational Force
2.	Thomas Alva Edison	
3.		Electric motor
4.	James Watt	
5.		Petrol Car
6.	Galileo	



## EVALUATION

I Choose the right answer :

1. In which state is the Thumba Rocket launching station located?  
a) Andhra                  b) Kerala                  c) Tamilnadu          d) Karnataka
2. Name the satellite which was designed by Vikram . A. Sarabhai  
a) Apple                  b) Rohini                  c) Aryabhatta          d) Insat
3. An instrument used to bring out the feelings or sensations of plants is \_\_\_\_\_  
a) Altimeter                  b) Crescograph  
c) Telescope                  d) Microscope
4. Father of microbiology is \_\_\_\_\_  
a) Jagadish Chandra Bose      b) Sir C.V. Raman  
c) Louis Pasteur                  d) Vikram.A.Sarabhai



## II. Fill in the blanks :

1. The research guide of Vikram Sarabhai was \_\_\_\_\_.
2. In 1996, Vikram Sarabhai was awarded \_\_\_\_\_ a high award of the Indian government.
3. British government honoured Jagadish Chandra Bose in the year 1917 with the title of\_\_\_\_\_.
4. The Bose institute is in \_\_\_\_\_.
5. The vaccine for Rabies was discovered by\_\_\_\_\_.

## III. Match the following :

- |                          |                         |
|--------------------------|-------------------------|
| 1. Vikram Sarabhai       | a) microbial research   |
| 2. Louis Pasteur         | b) wireless electricity |
| 3. Jagadish Chandra Bose | c) space research       |
| 4. Marconi               | d) satellite            |
| 5. Aryabhatta            | e) radio                |

## IV. Answer in one or two sentences :

1. Write a short note on Jagadish Chandra Bose.
2. Write about the life and contributions of Louis Pasteur.

## V. Answer in detail :

1. What do you know about the life history of Vikram Sarabhai?
2. Enlist the scientific achievements of Vikram Sarabhai





## VI Project

1. Collect information about any two Scientists – their life history and contributions to the field of science.
2. Make an album of pictures of scientists.





# **'I can, I did'**

## **Student's Activity Record**

**Subject :**