

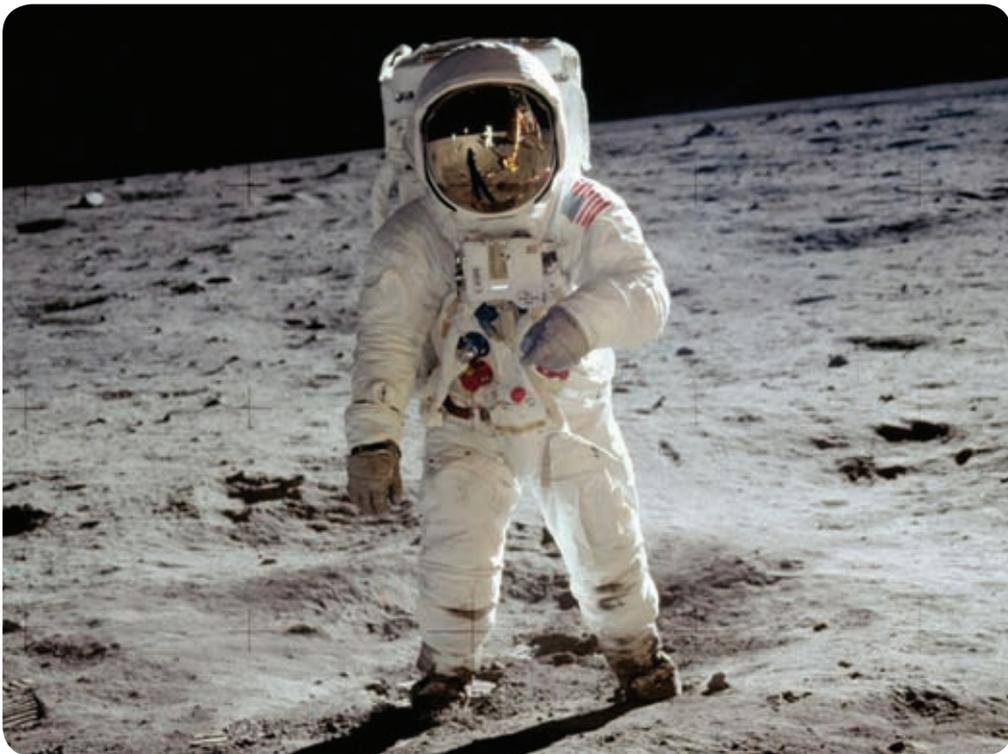
# UNIT-1

The Solar System and Planet Earth

Globes and Maps

Sources of Water

Care for Our Environment



# Chapter 1

**Starter Question:** Can you name some objects that you see in the sky?

**Teacher's Aid:** Teachers can use the application – night sky watch on their smart phones to get students attention.



# The Solar System and Planet Earth



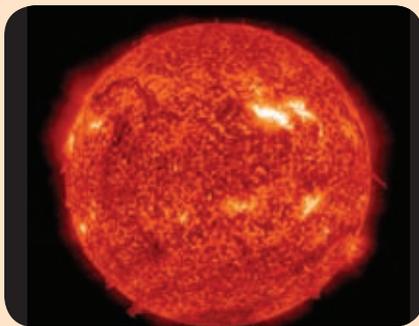
Which is the biggest star in the Universe?

## The Solar System

The solar system was formed billions of years ago. It consists of the **Sun**, the **eight planets** and their **satellites**. All these planets revolve around the Sun in their respective orbit. Let us learn more about the solar system.

## The Sun

The Sun is at the centre of the solar system. It is a huge ball of hot burning gases. It is the main source of heat and light for all the heavenly bodies that revolve around it.



The Sun is a huge ball of fire.

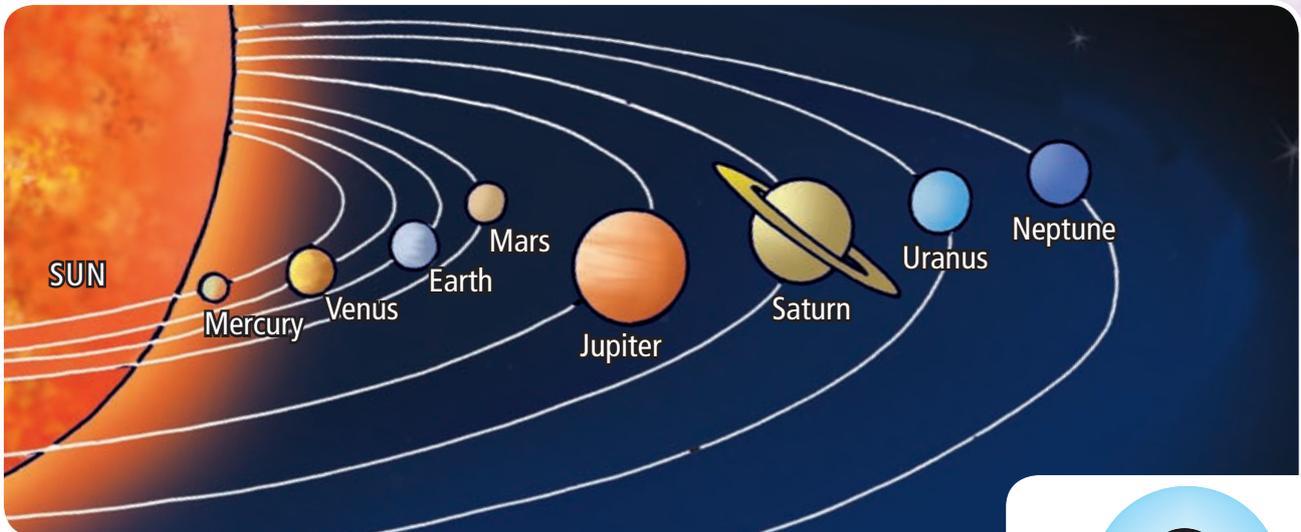
## DID YOU KNOW?



The **SUN** is also a star. It looks bigger compared to other stars, because it is closer to our planet, Earth.

**GALILEO**, a famous scientist, was the first man to see the sky through a telescope.

The Sun is a **star** and the eight planets that revolve around it. These are **Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus** and **Neptune**.



The Sun and eight planets

## The Planets

The planets are made of rocks, metals and gases. They revolve around the Sun on fixed paths called **orbits**. Planets do not have any light of their own. Every planet has its own satellite that revolve around the planets. Let us learn more about them. Here, the planets have been discussed in the increasing order of their distance from the Sun.

**Mercury** is the smallest planet in the solar system. It is nearest to the Sun.

**Venus** is the brightest planet. It is the second planet from the Sun.

**The Earth**, our home planet, is the third planet from the Sun. It has one satellite, the Moon. It is the only planet in the solar system to have water and air, and therefore life.

**Mars** is a small planet and is often referred as the red planet.

**Jupiter** is the largest planet in the solar system. It is made up of gas. It has maximum number of satellites.

**Saturn** is the second largest planet in the solar system. It is famous for the ring around it.

**Uranus** is the third largest planet in the solar system.

**Neptune** is the eighth planet from the Sun.



**Think**

Do other planets also have life?



## DID YOU KNOW?

There are some very small planets in the Solar System. They are called Dwarf planets. Ceres, Pluto and Eris are Dwarf planets.



## ACTIVITY

Study the sky every night and find out how the Moon changes its shape. Make a note of the nights when there is a full moon, the nights that are moonless and the nights when you see only the crescent moon.

## Satellites

Satellites orbit around the planets. Like the planets, satellites also do not have any light of their own. They also reflect the light of the Sun. For example, the Earth has only one satellite—moon.

## The Earth

The Earth is our home. Scientists believe that the Earth is about 5 billion years old. It is made of rocks and metals and its surface has land and water. More than 70 per cent of the Earth's surface



The Earth

is covered with water. The Earth has very large bodies of water called **oceans** and large areas of land called **continents**. The Earth has five oceans and seven continents.

The **Pacific Ocean** is the largest ocean. It covers one-third of the Earth's surface. The **Atlantic Ocean** is S-shaped. It is the busiest ocean for trade and commerce. The **Arctic Ocean** is the smallest ocean. It is in the North Pole. The **Antarctic Ocean** or **Southern Ocean** is in the South Pole. The **Indian Ocean** is to the south of India and is called half an ocean.



Continents and Oceans

The two continents, **North America** and **South America**, are joined by the Panama Canal. The continent of **Africa** is rich in natural resources. The continent of **Europe** is often referred as a peninsula. A peninsula is a piece of land surrounded by water on three sides but still attached to the mainland. **Asia** is the largest and **Australia** is the smallest of the seven continents. **Antarctica** is an icy continent covered with snow most of the year.

### Movements of the Earth

There are two types of Earth movements—**rotation** and **revolution**.

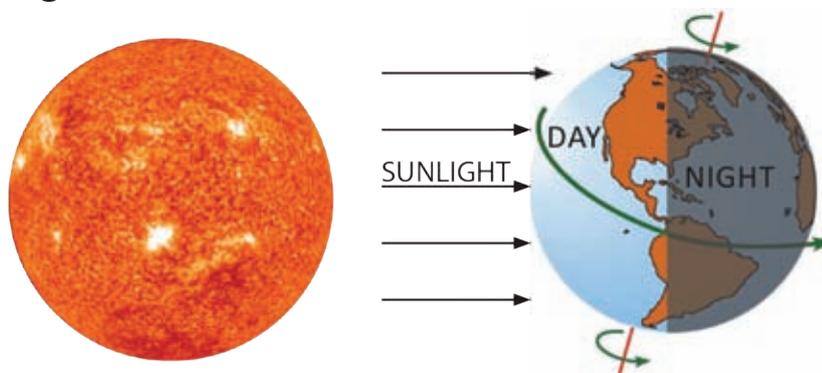
**Rotation:** The movement of the Earth on its own axis is called rotation. It takes the Earth about 24 hours or one day to complete one full rotation.

Rotation of the Earth causes **day** and **night**. The Earth spins from west to east. As it spins, one part of the Earth faces the Sun and receives sunlight. At that time, the other part of the Earth, which is away from the Sun, gets no light. Thus, when it is day in one part of the world, it is night on the other side of the world. That is why when it is day in India, America has night.

**Revolution:** The movement of the Earth around the Sun on its fixed orbit is called revolution. It takes the Earth about  $365\frac{1}{4}$  days or one year to complete one revolution around the Sun. The axis (imaginary line passing through the middle of the Earth) of the Earth is tilted. This causes the Earth to bend towards the Sun. Therefore, certain parts of the Earth, which are closer to the Sun, get more sunlight compared to some other parts. Also, throughout the year, as the Earth orbits the Sun, it receives different amounts of sunlight and heat from the Sun, according to its distance from the Sun. This causes **change of seasons**, such as spring, summer, monsoon, autumn and winter.



Why does the Sun rise in the East and set in the West?



Rotation from west to east



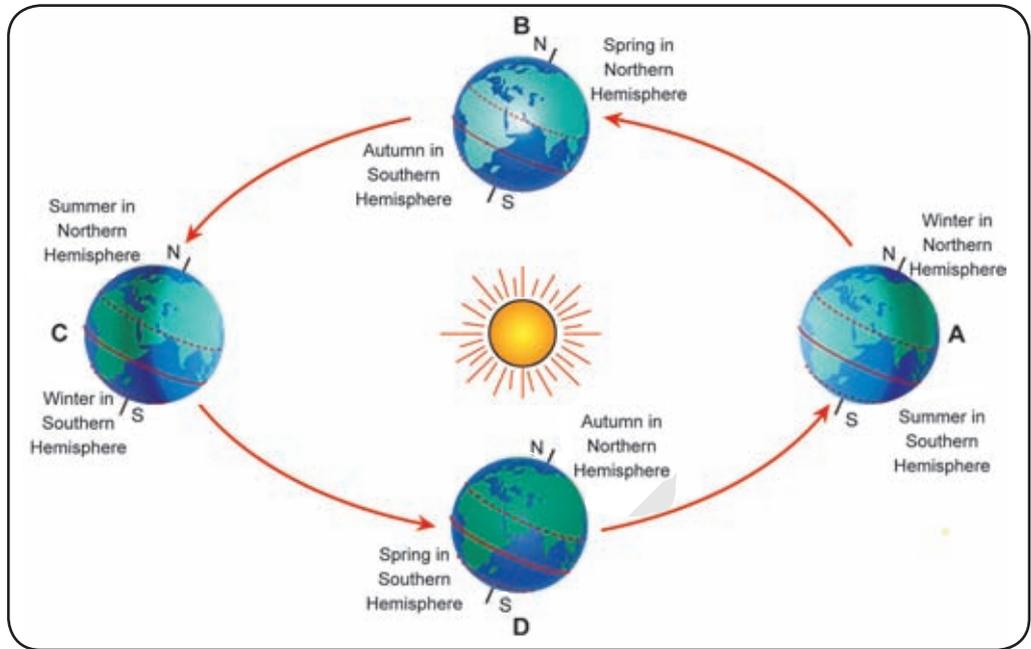
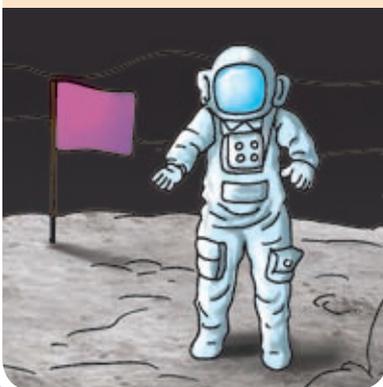
## Think

Where does the moon go in the morning?



## DID YOU KNOW?

Neil Armstrong, an American astronaut, was the first man from the Earth to walk on the Moon. Besides the natural satellites or moons of the planets, there are also man-made satellites sent to space from the Earth, which monitor and study the Earth and other heavenly bodies.



## The Moon

The Moon is the only natural satellite of the Earth. It is much smaller than the Earth, about one-fourth the size of the Earth. It appears to be much bigger than the stars because it is much closer to the Earth.

The Moon does not have any light of its own. There is no air, water or life on the Moon. Its surface is covered with **craters** and **mountains**. Craters are large holes or depressions. The Altken basin is the largest crater on the Moon and in our Solar System.



## Points to Remember

1. The Solar System consists of the Sun, the eight planets and their satellites.
2. The eight planets that revolve around the Sun are Mercury, Venus, Earth, Jupiter, Saturn, Uranus and Neptune.
3. The Earth has five oceans and seven continents.
4. The Earth shows two types of movements—rotation and revolution.

# EXERCISES

## A. Choose the correct option. (MCQs)

1. What will you call Sun?  
a. Planet            b. Satellite            c. Star            d. Meteorite
2. Which planet comes between Saturn and Neptune?  
a. Mars            b. Venus            c. Mercury            d. Uranus
3. The largest planet in the solar system is  
a. Mars            b. Neptune            c. Jupiter            d. Venus
4. Name the smallest ocean.  
a. Antarctic Ocean            b. Arctic Ocean  
c. Indian Ocean            d. Pacific Ocean

## B. Fill in the blanks.

1. The solar system is ..... in shape.
2. Planets are made up of ....., ..... and .....
3. .... is the smallest continent.
4. The Sun is a .....
5. .... is the fifth planet in the solar system.

## C. Write True or False for the following statements.

1. Planets have no light of their own.
2. The Pacific Ocean is the largest water body on the Earth.
3. Asia is the largest continent.
4. Rotation of the Earth causes changing of seasons.
5. The Moon is a satellite of the Sun.

## D. Answer the following questions.

1. What is an orbit?
2. Name the eight planets of the solar system.
3. How does the Earth move?
4. What is the name of the Earth's satellite? Write a few lines about it.
5. Name the first astronaut to walk on the Moon.

**HOTS**

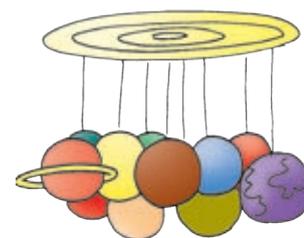
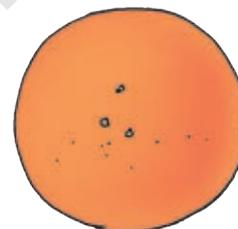
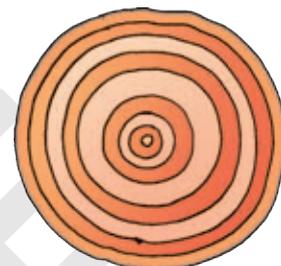
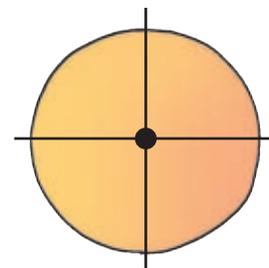
## E. MODEL MAKING — Model of the Solar System

### What You Need

A round piece of cardboard of about 1 foot, pencil crayons or marker pens, scissors, tape, string and a compass (for making circles).

1. Find the centre of the cardboard by drawing a line from top to bottom and a line from right to left. The point where these two lines meet is the centre of the circle. This will be the position of the Sun.
2. Using a compass, draw circles around the centre point of the cardboard to make orbits of the eight planets.
3. Punch a hole in the centre for the Sun. Then punch eight more holes for the planets.
4. Cut round-shaped cardboards of different sizes to represent the Sun and each of the eight planets. Make Jupiter, Saturn, Uranus and Neptune a bit smaller than the Sun. Make the other four planets much smaller. Write the name of each planet on the backside.
5. Attach strings to each planet and the Sun. Put knots on one end of each string and pass the strings through the correct holes, in the large round cardboard.

Thus, a model of the solar system is ready.



## F. DIARY ENTRY

Watch the moon for one month. Make a diary entry of the changes in the shape of the moon and write one line about each one.



**Life Skills**

Enact the revolution and rotation of planets around the Sun with a group of nine classmates.



**Web Links**

<http://en.wikipedia.org/wiki/solar-system>  
<http://www.Kidsastronomy.com/solar-system>



# Globes and Maps

Have you ever wondered how does earth looks like from the space?

It looks like a blue ball. But it is difficult to see the entire earth without going into the space so we use a model of Earth to study about it. This model of earth is called a **Globe**. Let us learn more about globes.

**Starter Question:** Can you pin point Allahabad on the globe?

**Teacher's Aid:** On a map of India show the  $82.5^{\circ}$  E longitude and explain why is it important.



This is a globe.



This is a map.

## The Globe

Globe is a miniature model of the planet Earth. We can see the continents, countries and oceans on the globe. Can you find your country on the globe? Try it.

Globe is a representation of the Earth and it gives us a realistic view of how the seas and land on Earth are laid out. It also helps us in studying Earth's rotation on its axis.

## DID YOU KNOW?



Sailors at sea and pilots in air use globes and maps to find their way.



## Think

Why do we have these imaginary lines on a globe?

## Lines on the Globe

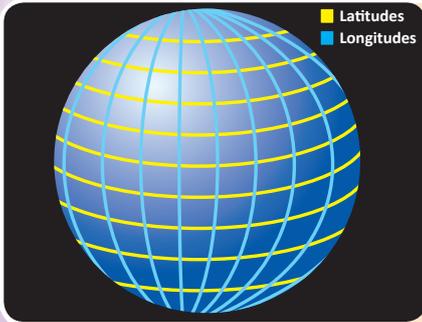
If you look at a globe carefully, you will see many lines on it. These are imaginary lines. Some lines run from side to side. These lines are called **latitudes**. Some lines run from top to bottom. These lines are called **longitudes**.

Some of these lines of latitude and longitude have special names. For example, the imaginary line that cuts the globe into two parts is called the **equator**. The equator is a



### DID YOU KNOW?

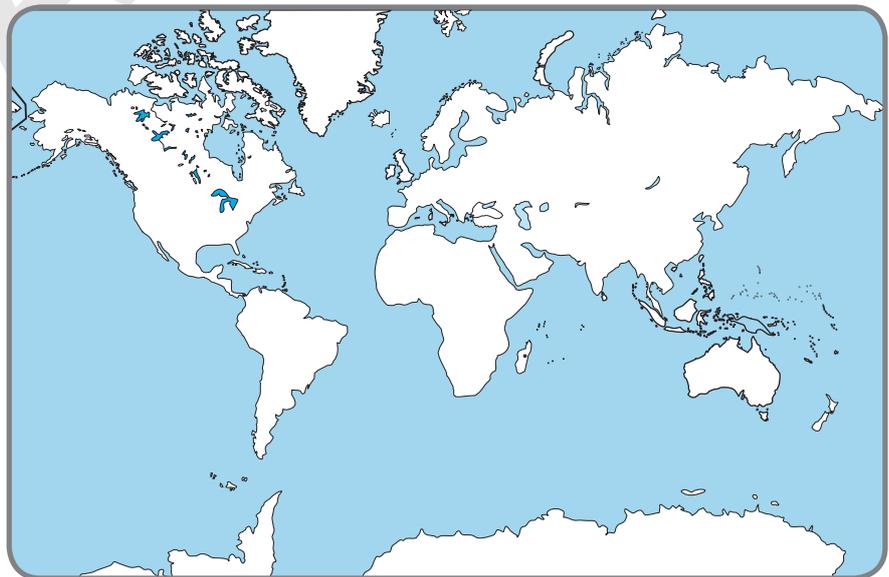
- Lines of latitude and longitude are measured in degrees [°].
- Lines of latitude never meet as they run parallel to each other. So, they are also called as parallels.



line of latitude. The equator divides the globe into two equal parts. The part towards the north of the equator is called the **Northern Hemisphere**. The part towards the south of it is called the **Southern Hemisphere**. Similarly the zero degree longitude divides the earth into the **Eastern** and **Western hemisphere**. Look at the globe and tell the location of India on it.

## The Map

A map is a two dimensional representation of the Earth. A map can be carried everywhere as it is drawn on paper, which we can fold and carry. But a globe cannot be carried everywhere. This is why we mostly use a map.



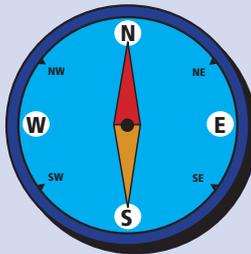
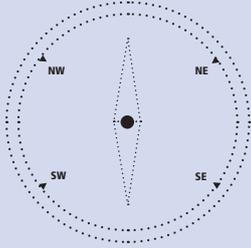
Physical Map of world





## ACTIVITY

Trace the compass rose. Write N, S, E, W at the right places.



symbols to the areas where they are marked.

**Directions:** They are always given on a map. The top of the map is the **North**. The bottom of the map is the **South**. The right hand side is the **East** and the left hand side is the **West**.

The imaginary lines of latitude and longitude are drawn on maps to easily locate places on the Earth.

The important lines of latitude drawn on the map are the equator, Tropic of Cancer, Tropic of Capricorn, Arctic Circle and Antarctic Circle.

## A comparison of globes and maps

LOBES	MAPS
<ul style="list-style-type: none"><li>• The globe is a miniature model of Earth.</li><li>• Globes are big in size and heavy. So, they are difficult to carry.</li><li>• We cannot see the whole Earth on the globe at the same time. To do so, we have to rotate the globe.</li><li>• It is difficult to locate small areas, towns and cities on the globe.</li></ul>	<ul style="list-style-type: none"><li>• The map is a flat depiction of the Earth's surface.</li><li>• A map is easy to carry around, as it can be folded or rolled.</li><li>• A map provides a clear picture of the entire Earth at one go.</li><li>• On a map, it is easy to locate even small villages, towns and cities.</li></ul>

## Points to Remember



1. A globe is a miniature model of the planet Earth.
2. A map is a picture of the surface of the Earth drawn on a flat piece of paper.
3. Symbols, directions, colours and lines of latitudes and longitudes help us to read globes and maps.

# EXERCISES

## A. Choose the correct option. (MCQs)

1. The Earth rotates on its  
a. latitudes      b. longitudes      c. equator      d. axis
2. Which kind of map shows places like hotels?  
a. Physical map      b. World map  
c. City guide map      d. None of the above
3. Lines that run from east to west are called  
a. longitudes      b. latitudes      c. equator      d. hemisphere
4. If you are travelling from India to the USA in which direction are you going?  
a. South      b. North      c. East      d. West

## B. Fill in the blanks.

1. A globe is a ..... of planet Earth.
2. Lines running from top to bottom on the globe are called .....
3. The part of the Earth towards the north of the Equator is called .....
4. We use a ..... map to travel in a new city.

## C. Choose the correct answer.

1. The rod passing through a globe is the orbit/axis.
2. Equator is a line of longitude/latitude.
3. We can see the whole Earth on a globe/map.
4. A map that shows mountains and plains is called a political/physical map.

## D. Answer the following questions.

1. What is a map? Name any three types of maps.
2. What is an index key?
3. Name the four directions.
4. Write down any two features of a globe.
5. Mention three features of a map.

## E. Map Work

Trace the outline of the map of India and also trace and draw the lines separating one state from another. Now fill the different states with different colours. With a sketch pen, write the name of each state.

## F. Chart Work

On a chart paper draw the model of the earth to represent the lines of latitudes, longitudes, North Pole and South Pole.

## G. Compare and Contrast

Give three points of comparison and differentiation between globes and maps.



### Life Skills

Buy a map of your city and try to find the area in which your school is located. Also mark your favourite places in the map with the help of an adult.



### Web Links

<http://en.wikipedia.org/wiki/globe>  
<http://www.kids.britannica.com>



# Sources of Water

Water is life. It is the most precious gift of nature. About 70 per cent of the Earth's surface is covered with water that is why earth is called a blue planet. Life without water is just not possible. Water is used for drinking, cooking, washing, irrigation, industry and for many other purposes.

## Sources of Water

There are two main sources of water—surface water and ground water. Let us read about the surface water.

### 1. Surface of Water

#### a. Rain

Rain is the primary source of water on Earth. It is also the purest form of water. Water from water bodies evaporates to form clouds in the atmosphere. Clouds fall down as rain. Rain feeds all water bodies like rivers, ponds, lakes and oceans. Some water also seeps into the ground. In some areas, people collect rainwater from their rooftops and store it in small tanks. This is called **rainwater harvesting**. The rainwater thus collected is used later when there is scarcity of water.



Lake

Discover—3

**Starter Question:** Why don't we usually have a 24 hours water supply at home? From where do we get water?

**Teacher's Aid:** Show a picture of water cycle and explain how water changes its states in nature.



Collecting rainwater

#### b. Lakes and ponds

A small water body surrounded by land is called a pond whereas a large water body surrounded by land is called a lake.



Name three rivers of India.

### c. Rivers

Rivers have their origin in the mountains or from lakes and they usually end in the sea or ocean. Rivers flow across large areas of land and finally empty their water into the sea. We use river water for drinking and domestic purposes. In hilly areas, a river sometimes falls almost vertically from a height. This is called a **waterfall**.

### d. Seas and oceans

About 97 per cent of the total water on Earth is present in seas and oceans. Sea water cannot be used for drinking because of the high salt content.



Ocean

## 2. Underground water

Some of the rainwater seeps through into the ground and collects below the Earth's surface. It is called underground water. It passes through different layers of soil and gets filtered in the process. Underground water is clean and safe for drinking. Different methods are used to draw underground water.

- Wells:** In villages, wells are a common source of water. They provide ample supply of water for use throughout the year.
- Tubewells:** A tubewell is a modern and efficient method of obtaining groundwater. A hole is drilled in the



Tubewell



Hand pump

ground and a pipe is inserted in it. The pipe is attached to an electric motor. The motor pumps the groundwater to the surface. Tubewells are generally used to extract groundwater for irrigation purposes. If the water is of sufficiently good quality, it can also be used for drinking purpose.

- Hand pump:** It is a traditional method of extracting water from the ground. In this method too, a pipe is bored into the ground.

A handle is attached to the outer end of the pipe. Unlike the tubewell, a hand pump is operated by hand.

### Safe Storage and Handling of Drinking Water

- Water should be stored in clean vessels.
- We should not put our hands into the vessel to take out water. A long-handled ladle should be used.
- The vessel or the pot in which water is stored should be covered properly.

### Do not Waste Water

Water is a precious natural resource. We should use it judiciously. We should not waste water.

- Turn off the tap after use.
- Do not throw water around just for fun.
- Take bath with a bucket of water instead of a shower.
- Get leaking pipes repaired immediately.
- Harvest rainwater.

### DID YOU KNOW?



In many villages, people don't get water through taps. They have to walk long distances to fetch it.

### Points to Remember



1. Water is a precious natural resource. We use water for many activities of everyday life.
2. Water is colourless, tasteless and has no smell.
3. Rain is the primary source of water on Earth.
4. Rivers, oceans, seas, waterfalls, snowfall, etc., are various sources of water.
5. Wells, tubewells and hand pumps are the main sources of underground water.
6. Water should be stored in clean vessels.
7. We should not waste water.

# EXERCISES

## A. Choose the correct option. (MCQs)

1. What is a large water body surrounded by land called?  
a. Pond      b. River      c. Lake      d. Ocean
2. Name the primary source of water on Earth.  
a. Underground water      b. Sea  
c. Lake      d. Rain
3. Which of the following is a source of surface water?  
a. Wells      b. Tubewells      c. Hand pump      d. Rivers
4. Which source of water usually end in the sea or ocean?  
a. Tubewell      b. River      c. Rain      d. Hand pump

## B. Fill in the blanks.

1. .... is the purest form of water.
2. .... of the earth's surface is covered with water.
3. We should drink water in a ..... vessel.
4. Water is a ..... resource.

## C. Name the water source.

1. Small depressions in land that have been filled with water .....
2. Huge water bodies of salty water .....
3. A modern and efficient way of drawing out water from the ground .....

## D. Answer the following questions.

1. What is the primary source of water on Earth?
2. How are tubewells useful to us?
3. Write three ways in which water is wasted.
4. Write three activities to preseve water.
5. Why is rainwater harvesting beneficial for us?

## E. Activity

Take a glass filled with water.

1. Bring it close to your nose. Does it have a smell?
2. Take a close look at the water. Does it have any colour?
3. Take a sip from the glass. Does it have any taste?

So, water does not have any colour, taste or smell.

## F. Model Making

**Make your own filter at home.**

Take a plastic water bottle and cut it into two equal pieces from the middle. Plug the neck of the bottle with cotton. Now invert the upper half of the bottle and place inside the bottom half. Fill the top half with pebbles, gravel and sand. Pour in some muddy water now. You will notice that the muddy water gets sieved (filtered) as it passes through the different layers of rocks and the cotton. The water is collected at the bottom half of the bottle.



### Life Skills

At times even a deep well in your nearby area becomes dry. What can be the reason for this?



### Web Links

<http://en.wikipedia.org/wiki/waterresources>  
<http://www.ask.com>Q&A>science>environment>

