Contents

1 The Globe — A Model of the Earth

Mind opener

If the Earth was flat, what would happen to a person who reaches the edge of the Earth and continues walking? He would surely fall off! But, nobody has ever fallen off the Earth in this way. What does this show?

Looking Ahead

In this lesson you will learn about:

- *The globe as a model of the Earth*
- *The lines of latitudes and longitudes*
- *Locating places on the global grid*

The Shape of the Earth

The Earth, as you know, is round. But when you look around you, it appears to be flat. In fact, long ago everyone believed that the Earth was flat. They believed that if we travelled to the edges, we would fall off!

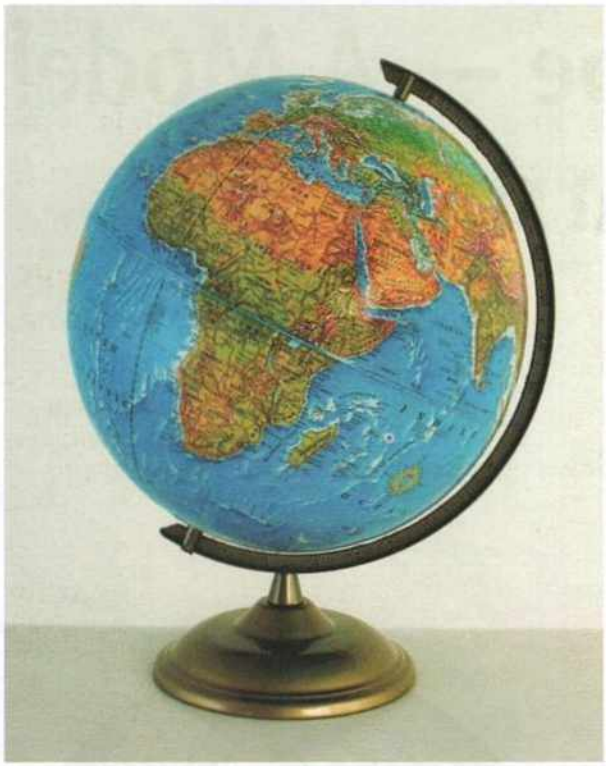
The Earth appears flat to us because the Earth is so much bigger than us. We can only see short distances at a time. To see the curving surface of the Earth, you would have to climb very high into the sky. For example, if you were to fly into the sky in a rocket, you would soon be able to see the Earth curving away into the distance.

The Earth as seen from space

The large size of the Earth makes it difficult for us to study it as a whole. Geographers have developed different means of representing the Earth on a smaller scale, to make its study easy. Two important tools that we use for this purpose are **globes** and **maps**.

The Globe

The globe is a small model of the Earth. It shows us the shape and location of the continents, oceans and seas on a smaller scale. It also shows the shape and location of countries, and the location of important cities.



The globe

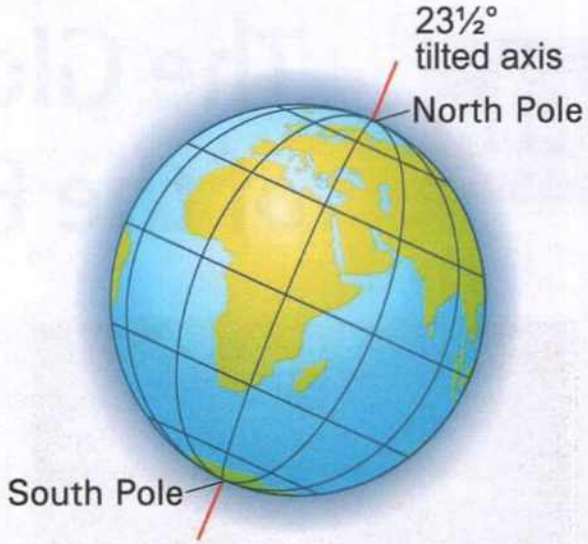
You can only see half the globe at one time. However, you can turn the globe around to see the other half. It can be turned around a line passing through it. This line is called the **axis**. The axis is not straight. It is tilted at an angle of

23 ½ °.

The Earth constantly rotates, or turns, around its axis of rotation. The Earths axis too is tilted at an angle of 23 ½° to the vertical. The axis of rotation of the globe is similar to that of the Earth.

The North and South Poles

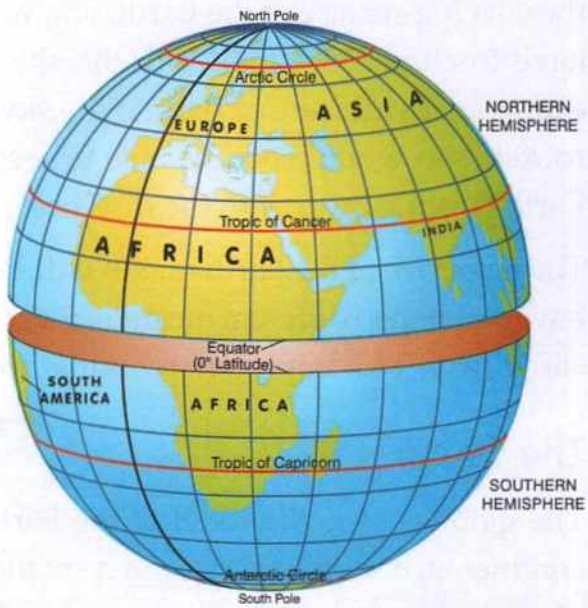
The two end points of the axis of rotation are called the **poles**. To the north is the **North Pole**, and to the south is the **South Pole**.



The tilted axis of rotation of the Earth

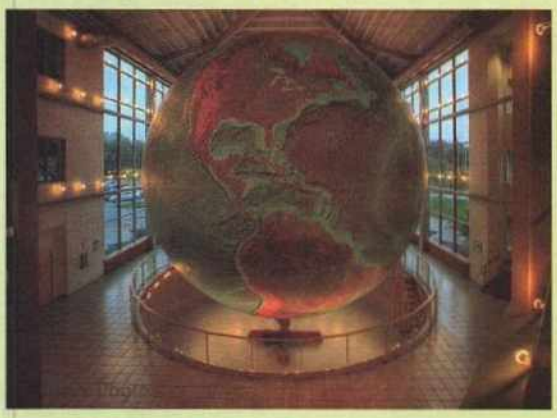
The Northern and Southern Hemispheres

Midway between the poles is an imaginary line circling the Earth. It is called the **Equator**. It divides the Earth into two equal halves, called the **hemispheres**. To the north of the Equator is the **Northern Hemisphere**, and to the south of the Equator is the **Southern Hemisphere**.



Did you know?

The largest globe in the world is called Eartha. Located in Yarmouth, in Maine, USA, Eartha is a 3-dimensional (3D) scale model of our Earth. It shows mountains and other landforms in 3D, and measures 41.5 feet in diameter. Eartha rotates and revolves just like the Earth does.



Eartha, the world's largest globe

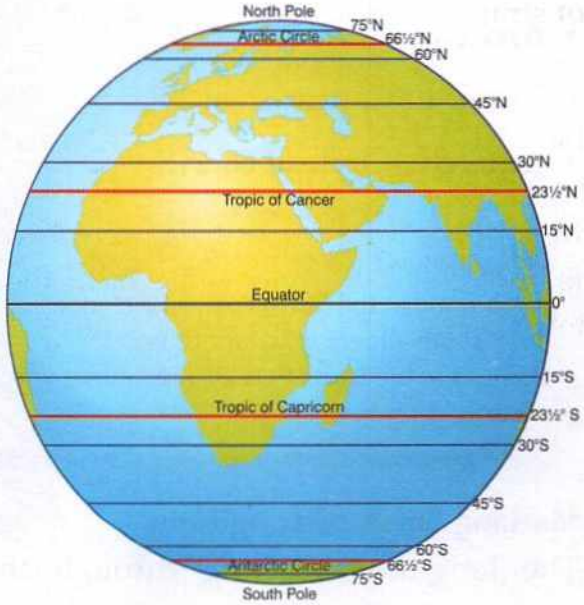
Lines of Latitude and Longitude

To locate places on the globe, horizontal and vertical lines are drawn on it. The horizontal lines are drawn parallel to the Equator. Like the Equator, they go around the Earth. They are known as **lines of latitude** or **parallels**. The vertical lines are semicircles that run from the North Pole to the South Pole. They are called **lines of longitude** or **meridians**. Lines of latitude and longitude are marked in degrees (°) and minutes (′). Sixty minutes equal one degree (60′ = 1°).

Marking Lines of Latitude

The Equator is marked 0°. The North Pole is 90° North, and the South Pole is 90° South. Thus, the latitude of a place tells you how far north or south a place is from the Equator. For example, a place with a latitude of 45° North is located in the Northern Hemisphere, midway between the Equator and the North Pole. A place with a latitude of 60° North is further north.

Earth – latitudes and longitudes



Earth – important latitudes

There are 180 degrees of latitude in all. There are 90 degrees of latitude in the Northern Hemisphere and 90 degrees of latitude in the Southern Hemisphere.

Features of Latitude

- Lines of latitude run parallel to each other in the east-west direction.
- They are at an equal distance from each other.
- All of them form complete circles, except the North and South poles, which are points.
- The parallels decrease in length as you move from the equator to the poles.

Important Lines of Latitude

Other than the Equator and poles, there are four other important lines of latitude. These are:

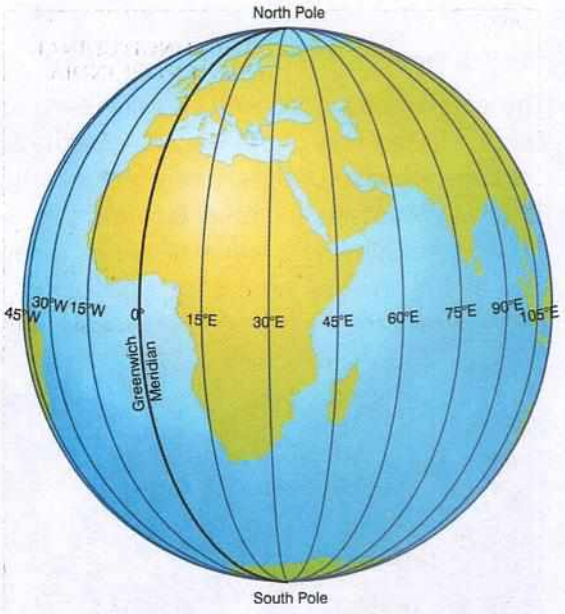
- **Tropic of Cancer** at 23½° N
- **Arctic Circle** at 66½° N
- **Tropic of Capricorn** at 23½° S
- **Antarctic Circle** at 66½° S

Did you know?

If you stand at the North Pole, all directions point south – there is no east or west! Similarly at the South Pole all directions point north.

Marking Lines of Longitude

The longitude running through the old Royal Observatory at Greenwich



Earth – important longitudes

near London is marked 0°. It is called the **Greenwich Meridian** or the **Prime Meridian**. There are 360 degrees of longitude — 180 degrees of longitude east of the Prime Meridian, and 180 degrees of longitude west of the Prime Meridian. The 180° East and 180° West meridian meet and form a single line on the opposite side of the world, called the 180° longitude or the **International Date Line**.

Thus, the longitude of a place tells you how far east or west of the Greenwich Meridian the place is located.

Features of Longitude

- Lines of longitude are semi-circles that run from one pole to the other pole.
- They run in a true north-south direction.

- They are spaced farthest apart at the Equator and come together to a point at the poles.
- The lines of latitude and longitude cut each other at right angles.

The Global Grid

The lines of latitude and longitude together form a network of lines, or a **grid**, on the globe. This is known as the global grid. If we know the longitude and latitude of a place we can locate it accurately on the global grid.

I now know

1. A globe is a small model of the Earth.
2. The Equator is an imaginary line encircling the Earth midway between the poles. It divides the Earth into two equal halves called the hemispheres.
3. Lines of latitude are horizontal lines drawn on a globe or map that go round the Earth, parallel to the Equator.
4. Lines of longitude are vertical lines drawn on a globe or map, that run from the North Pole to the South Pole.
5. If we know the latitude and longitude of a place, we can locate it accurately on the global grid.

Words to remember

axis: an imaginary line that runs through the North Pole and the South Pole, and around which the Earth spins

poles (of the Earth): the two end points on the axis of rotation of the Earth

Equator: an imaginary line that goes round the Earth and divides it into the northern and southern hemispheres

lines of latitude (or parallels): imaginary lines that are drawn round the Earth parallel to the Equator; they measure the distance of a place north or south of the Equator

lines of longitude (or meridians): imaginary lines that run vertically from the North Pole to the South Pole; they measure the distance of a place east or west of the Prime Meridian

Exercises

A. Fill in the blanks.

1. The Earth rotates along an imaginary line called the _____ .
2. The Earth is divided into two hemispheres along an imaginary line called the _____ .
3. _____ are lines that run parallel to the Equator.
4. On a globe, the lines running between the two poles are called _____ .
5. The latitude marked 23½° S is known as the _____ of _____ .
6. The meridian marked 0° is called the _____ Meridian.

B. Match the columns.

1. Arctic Circle	a. 23½° N
2. Antarctic Circle	b. 66½° N
3. Tropic of Cancer	c. 0° meridian
4. Greenwich	d. 66½° S

C. Answer the following questions.

1. How is the globe useful?
2. Why are lines of latitude and longitude drawn on the globe?
3. What is the Prime Meridian?
4. If a place has a latitude of 10° N, is it in the Northern or Southern Hemisphere?
5. We know that the nearer a place is to the poles, the colder it is likely to be. Which city, in a) and b) below, is likely to be colder?
   a. City X: latitude 30° N, longitude 25° W, or City Y: latitude 60° N, longitude 20° E.
   b. City W: latitude 40° S, longitude 75° E, or City Z: latitude 75° S, longitude 50° W.

Multiple choice questions

1. Which of these is an imaginary line?
   a. Equator b. Longitude c. Latitude d. all of these
2. Which of these pertains to the North Pole?
   a. 90° N b. 0° N c. 180° N d. 180° S
3. Which of these lies in the Southern Hemisphere?
   a. Tropic of Cancer b. Arctic Circle c. Tropic of Capricorn d. all of these
4. The longitude of a place tells us
   a. how far north or south a place is from the Equator
   b. how far east or west a place is from the Equator
   c. how far north or south a place is from the Prime Meridian
   d. how far east or west a place is from the Prime Meridian

5. The longest line of latitude is the:
   a. Tropic of Cancer b. Tropic of Capricorn c. Equator d. they are all equal
6. The longest line of longitude is:
   a. the Prime Meridian b. 180° East c. 90° West d. they are all equal

Enrichment Activities

- **Speak out:** What would our lives have been like if the Earth had been flat and not round? Prepare a humorous speech on the topic 'If the Earth had been flat' and share it with your classmates.
- **Write right:** Write a humorous essay on the topic 'The day the Earth really became flat'.
- **Art work:** Take a map of the world from an old atlas. Cut out 10 different countries from it and stick them on a chart paper. Collect pictures of interesting things about each country (could be the dress of the people, or their houses, or the physical features like mountains or beaches). Stick the pictures beside the country they belong to. Make the chart paper look as colourful as possible.
- **Project work:** Make a globe out of clay or play dough. You could also make it by pasting strips of paper on a balloon. Mark the main lines of latitude and longitude on it.
- **Map work:** Study the world map in your atlas. Name the continents and oceans through which the following pass.
  1. Equator 2. Tropic of Capricorn 3. Tropic of Cancer 4. Prime Meridian

Hands on!

- **Locating the axis of rotation of the globe**
  To locate the axis of rotation of a globe, rotate the globe and observe the movement of different points on it. Which two points do not move? These are the two poles. The line joining them, passing through the centre of the globe, is the axis of rotation of the globe.
- Study the lines of latitude and longitude marked on a globe. Locate the Tropic of Cancer, Arctic Circle, Tropic of Capricorn, Antarctic Circle and the Prime Meridian.
- **Finding the latitude and longitude of a place**
  Find out the lines of latitude and longitude of some important places in India from the map of India. Write them down.

HOTS: Think and Answer

- Are the lengths of the lines of latitude equal or unequal to each other? Give reasons for your answer.
- Can you find the exact location of a place on a globe by using only the latitude? What about the North and South Poles?

Life Skills and Values

Learning about nature through observation

While at home, make it a habit to watch where the Sun rises and sets each day. As you have learnt, if you stand facing the rising Sun (i.e., east) with your hands pointing out, your right hand will point to the south and your left hand to the north. Now mark these directions on the ground at a place where it will not be rubbed out.

Check the position of the rising and setting Sun once a week for six to eight months. What do you see? The point at which the Sun sets and rises keeps shifting slowly over the months. You will learn why this happens in a later class.

2 Maps

Mind opener

You are asked to draw a picture of your school as seen from:

- *Your classroom window*
- *A helicopter flying 100 m above the school*

In what way will the pictures be different? Which picture will show you the complete school? Which picture, do you think, will look like a map of the school?

Looking Ahead

In this lesson you will learn about:

- ***Why we prefer using maps to globes***
- ***What are maps; the different kinds of maps***
- ***The elements of maps: directions, scale and symbols***

The Globe and Maps

We have seen that the globe is a small model of the Earth. It is the most accurate way of looking at the size, shape and location of places on the Earth. However, it has several shortcomings.

- It is difficult to carry a globe around.
- It is not possible to see all the parts of the Earth's surface at the same time.
- It cannot show detailed information. To get detailed information we will have to make huge globes. They will be difficult to make and use.

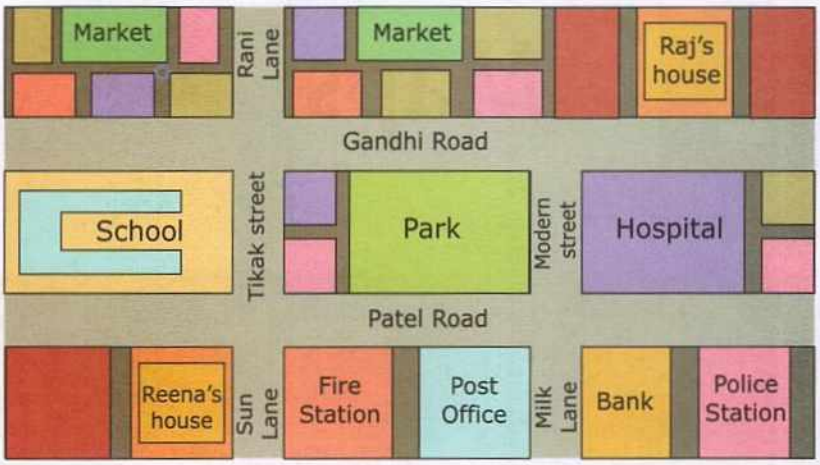
To avoid these problems, we normally use **maps** instead of a globe.

Did you know?

The science of making maps is called cartography. Some of the oldest maps made by humans are more than 8000 years old.

Did you know?

Claudius Ptolemy was a Greek mathematician and geographer who lived in Egypt more than 2000 years ago. He created several maps of the world.



A map of a neighbourhood

What is a Map?

A map is a drawing of the Earth's surface, or a part of it, on a flat surface, such as a sheet of paper. But you cannot flatten out the Earth's surface and show it accurately. So, there are some errors in the shapes and sizes of land masses in maps. People who make maps try to minimise these errors.

Different types of maps

Maps can be drawn to show the whole world, a single continent, a country, a city, your neighbourhood, and even your school. They can be drawn in any size.

The larger the area covered by a map, the more will be the errors in it. A map of your neighbourhood can be drawn accurately, as it covers a small area. But a map of India or a map of the world will have errors because they cover very large areas.

The map of the world shown on page 12 of this book is drawn on less than half a page. A **wall map** of the world can be several times its size, and shows many more details. It can be easily rolled up or folded and carried.

A book of maps is called an **atlas**. Turn the pages of your atlas and look at the different maps in it. You will find that there are several types of maps in it.

Some of these are as follows:

- Maps showing boundaries of the countries and states, and the important cities, known as **political maps**.
- Maps showing natural features of the land such as mountains, rivers and plains, known as **physical maps**.
- Maps showing crops grown or minerals found in various places
- Maps showing rainfall in different areas
- Maps showing roads, railway and airline routes

Elements of a map

Maps consist of certain elements. Some of them are **directions**, **scale**, **colour** and **symbols**. These elements are used to give us different bits of information about the map and the area it covers. Once we understand these elements, we will be able to use the map better.

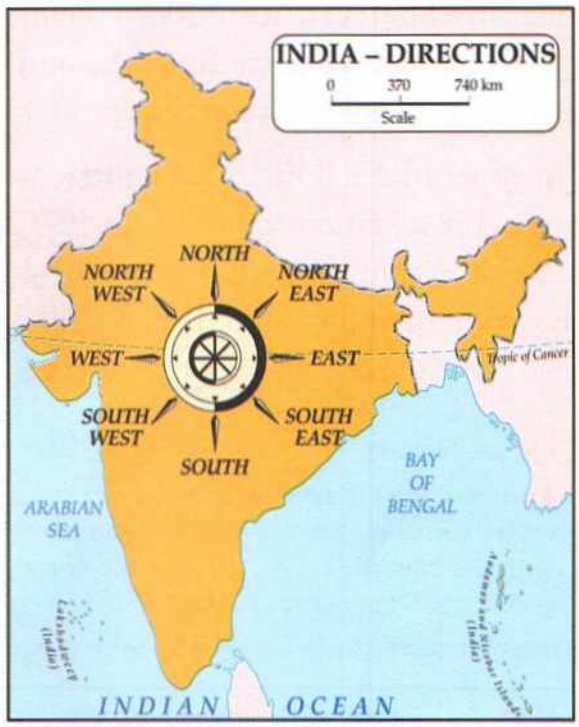
Directions

One of the most important elements of a map is direction. There are, as you know, four cardinal directions—**north**, **south**, **east** and **west**.

Usually maps are drawn with north at the top. Most maps indicate north with an arrow marked N. If you know where north lies, it is easy to find south, east and west.

If north is at the top, then south is at the bottom, east is to the right, and west to the left.

North-east lies between north and east, north-west between north and west, south-east between south and east, and south-west between south and west.

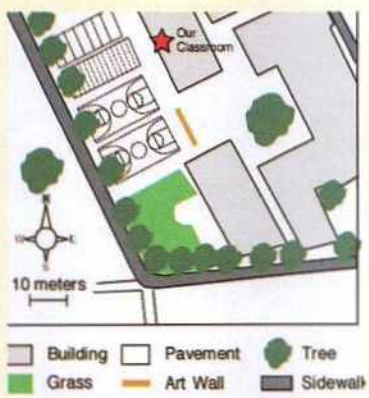


Scale

A map does not show the actual distances between places. Distances are shrunk so that the area being mapped can be fitted on a piece of paper. To be able to do this accurately, maps are drawn to a **scale**. The scale of a map is the ratio between distance shown on the map and the actual distance on the ground.

For example, the actual distance between two cities may be 100 kilometres. But on the

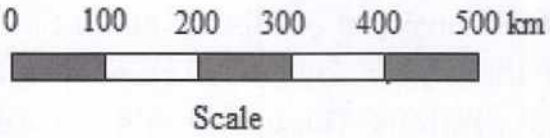
A photograph of a school taken from the air



A map of the same school; note the different elements it contains

map it may be shown as 1 centimetre. Then the scale of the map is '1 centimetre:100 kilometres'. On such a map, an actual distance of 500 kilometres will be shown as 5 centimetres, and a distance of 50 kilometres as ½ centimetre.

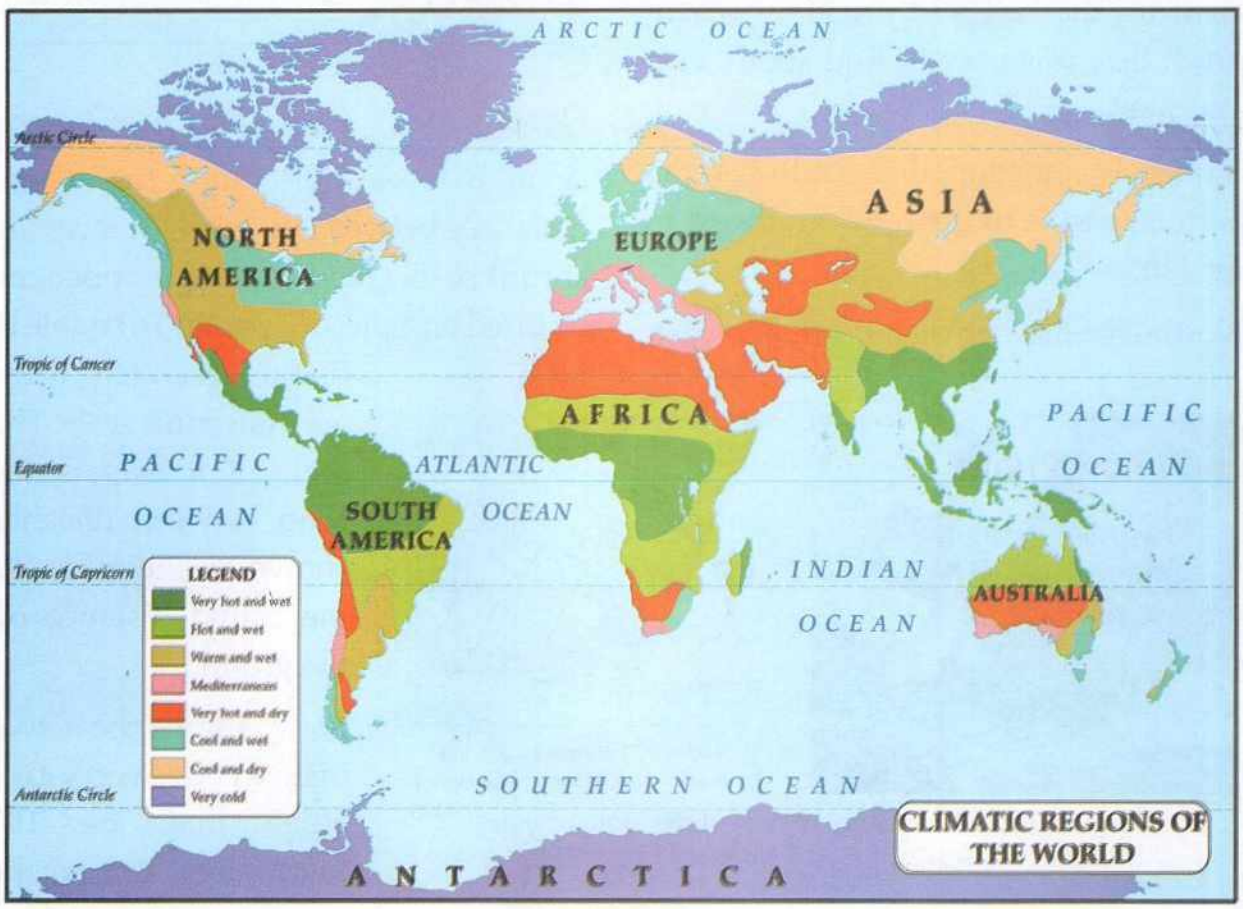
The scale of a map is often shown as a line with distances marked on it. The scale of '1 centimetre:100 kilometres' is shown here in this way. This is called a



linear scale. Each division in the bar is one centimetre (measured on the map) and indicates one hundred kilometres (as shown in numbers just above the bar) on the ground.

Did you know?

To understand the symbols and colours used in a map, most maps have a legend or a key. The legend explains what each of the symbols used stand for. It also explains what the colours represent. The legend is thus 'the key' to the map. It unlocks the secrets of the map. Look at the map of the world given here. Use the key to understand the map.



Colours

Certain standard colours are used in maps to show features such as oceans, seas, mountains, plains, deserts, etc.

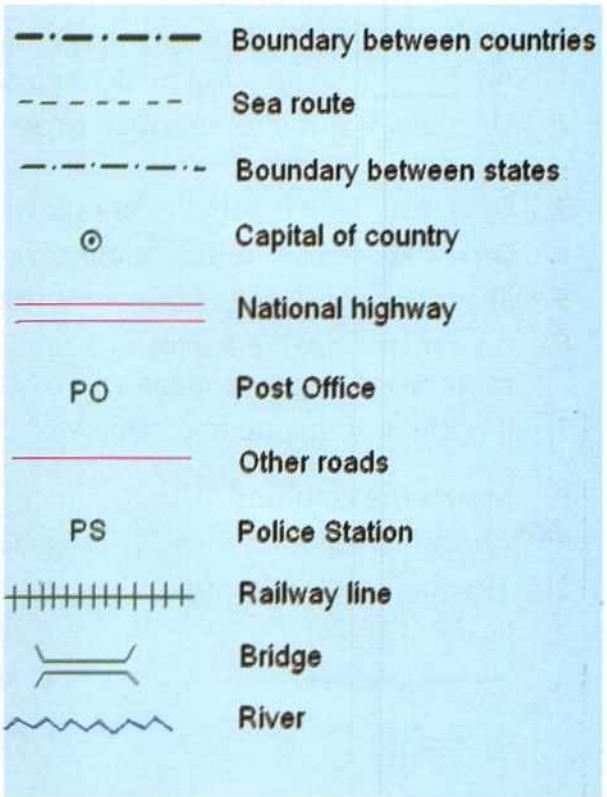
- **Water bodies** are always shown in blue. Deep blue shows deep waters and light blue shows shallow waters.
- **Mountains and highlands** are shown in brown and yellow. Dark brown shows high mountains. Light brown shows lower mountains and hills. Yellow shows plateaus.
- **Plains** and lowlands are shown in green.

Symbols

To make it easier to show features and places on a map, certain standard **symbols** are used in maps. A symbol is a shape or sign that is used to represent something. For example, to show a church on a map we can just put a cross at that spot, instead of writing the word 'Church' there. Symbols make it easier to read and understand maps. Once we are familiar with these, understanding a map becomes easier.

Look at the map on page 11. Note the symbols that have been used.

Given below are some of the standard symbols used in maps.



I now know

1. Maps are much more convenient to use than globes.
2. Different types of maps are drawn to study different things.
3. Usually maps are drawn with north at the top.
4. A map is drawn to a fixed scale. The scale of a map is the ratio between distance shown on the map and the actual distance on the ground.
5. Standard colours on a map are used for different features.
6. Standard symbols make understanding of maps easier.

Words to remember

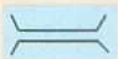
map: a representation of the Earth drawn on a flat surface
atlas: a book of maps
scale: the ratio between distances on a map to the actual distance on the ground
symbol: a shape or sign that is used to represent something

Exercises

A. Fill in the blanks.

1. An _____ is a book of maps.
2. The ratio of distance on a map to actual distance is known as the _____ of the map.
3. On a map, high mountains are shown in _____ .
4. On a map, the use of the colour blue shows _____ .
5. Shapes or signs used to represent features on a map are called _____ .
6. On a map drawn to a scale of 1 centimetre: 100 kilometres, a distance of five centimetres on the map means an actual distance of _____ .
7. If north is at the top in a map, west is to the _____ .

B. Match the columns.

1. Arrow marked N on map	a. Green
2. 1 centimetre:1 kilometre	b. Bridge
3. Plains	c. North
4.	d. Map scale
5. 	e. Boundary between two countries

C. Answer the following questions.

1. A globe is the most accurate way to represent the Earth. However, we generally use a map rather than a globe to study the Earth. Why is this?
2. A map of the Earth will have errors in the shape and size of places shown on the map. Why is that so?
3. How is direction usually shown in maps?
4. What do you understand by the term 'scale of a map'?
5. Which standard colours are used in maps?
6. What are symbols?

Multiple choice questions

1. Which of these maps will always have some errors?
   a. map of your house b. map of your school
   c. map of your neighbourhood d. map of the world
2. What does a political map show?
   a. features such as mountains, plains and rivers
   b. roads, railway and airline routes
   c. boundaries of countries, states and important cities
   d. number of seats won by political parties in an election
3. On a map, 1000 km is shown as 1 cm. The scale of the map is:
   a. 1000 kilometre:1 centimetre b. 1 centimetre:1000 kilometre
   c. 100 kilometre:1 centimetre d. 1 centimetre:100 kilometre
4. Blue colour in a map always shows:
   a. plain land b. hills c. water bodies d. marshy land
5. Which of these symbols represents a boundary between countries?
   a. – – – – – – b. —•—•—•—
   c. —·—·—·—·— d. ———

HOTS: Think and Answer

- A wall map of the Earth has errors because the Earth's surface is shown as flat. Do you think a wall map of your neighbourhood will also have similar errors? Why?
- Which map of India will be bigger—one drawn to a scale of 1 centimetre: 100 kilometres or one to a scale of 1 centimetre: 50 kilometres? Why?

Weblinks

http://www.mapsofindia.com/maps/schoolchildrens/

http://maps.google.com/ - choose whatever map you want to see in whichever size you want

http://www.google.com/earth/index.html - download Google Earth 6 and have fun

Enrichment Activities

- **Speak out:** Your classmates want to come to your house. Give them directions to reach your house from school. Mention a few landmarks they could look out for.
- **Maths is fun:** Your teacher will give you a map of India from which the scale has been removed. Measure the distance between Delhi and Chennai on the map. You can do this using a ruler or a thread. Now find out the actual distance between the two cities. Now calculate the scale of the map.
- **Art work:** Draw and colour a map of the world. You will have to do it freehand, without tracing.
- **Project work:** Do a project on the history of map-making, or cartography. You could work in groups. You could present your findings in the form of a report, or a chart, or you could even create a website.

Hands on!

On a map of your city locate some important landmarks such as the main roads, shopping centres and historical buildings. You can also use Google maps (check site 2 under Web Links). Make a rough sketch of the map in your notebook.

Life Skills and Values

Map Reading

Get a big map of your city. On the map, locate the road on which your house is located. Locate your school. Read the map and mark the shortest route you can take to reach your school from your house. Ask an elder to take you to school through that route.

Instead of a printed map, you can also use a Google map of your city on your computer (check site 2 under Web Links).

3 Movements of the Earth

Mind opener

All books tell us that the Earth is moving. If it is moving, why do we not feel this movement?

Looking Ahead

In this lesson you will learn about:

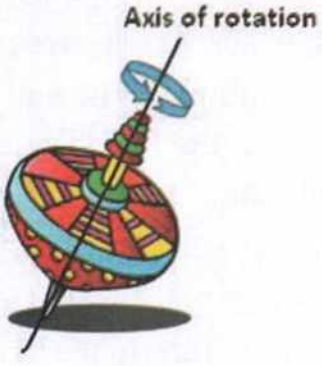
- *The movements of the Earth—rotation and revolution*

The Earth moves in two different ways. It **rotates** like a top, and also **revolves** or moves around the Sun in a fixed path. It does not seem to us that it is moving because everything on the Earth, including the air around it, moves with it.

Rotation of the Earth

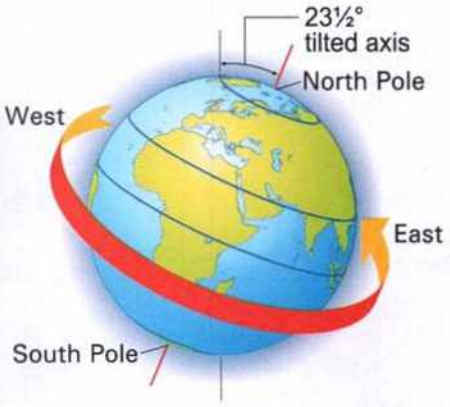
Take a globe and spin it. It spins around a line passing through its centre. This imaginary line around which it spins is called its **axis**.

The Earth also spins about its axis in the same way. This spinning motion of the Earth is called **rotation**.



A top spinning around its axis

Globe rotating around its axis



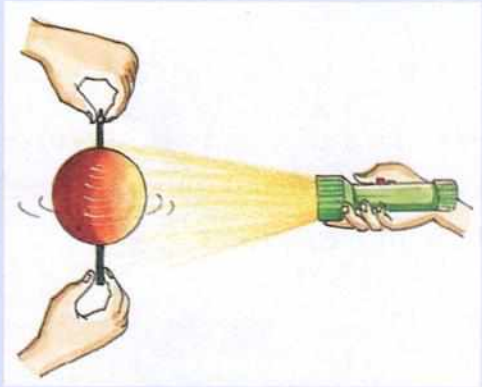
The Earth rotates around its axis

Day and night

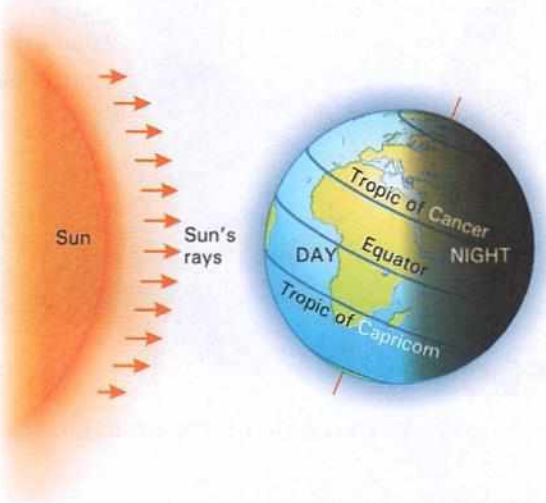
The rotation of the Earth around its axis causes day and night.

Hands on!

Shine a torch at a globe in a dark room. You will see that only half the globe is lit. The other half will be dark. Now rotate the globe. The dark areas now become lighted and the lighted areas go into darkness.



Try out the activity given above. The globe is like the Earth, and the torch is like the Sun shining on the Earth. The portion of the Earth facing the Sun has **day**. The portion facing away from the Sun has **night**. As the Earth rotates, day and night follow each other.



The Earth completes one rotation around its axis in **24 hours**. That is why one day and one night are of 24 hours.

Revolution of the Earth

The Earth also moves around the Sun in a fixed path called **orbit**. This movement is called the **revolution** of the Earth. The Earth completes one revolution around the Sun in about 365 days, or one year.

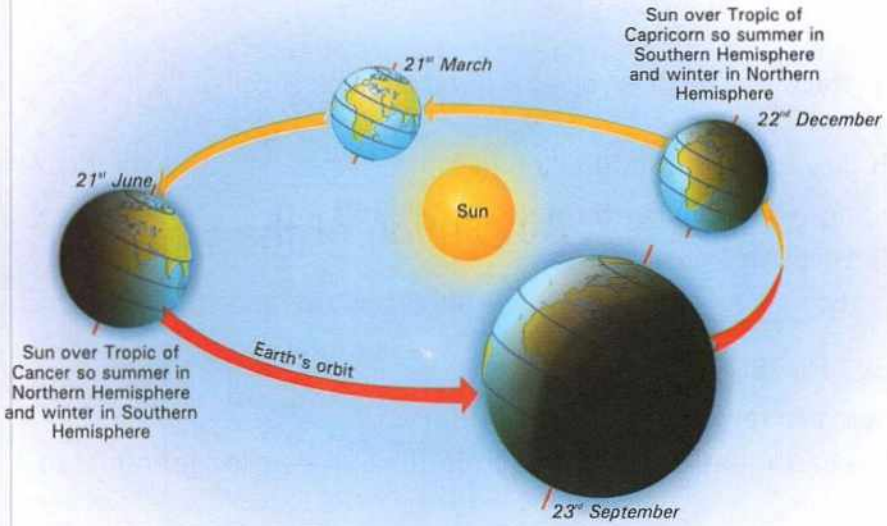
Did you know?

In the solar system, the planet Venus has the longest day. A day in Venus is equal to 243 days on the Earth. However, a year on Venus lasts for only 224.7 Earth-days. Therefore a day on Venus is longer than its year!
The planet Jupiter has the shortest day – only 9.8 Earth-hours!

Seasons

The revolution of the Earth gives us the different seasons—**summer**, **winter**, **autumn** and **spring**. While revolving around the Sun, the Earth is tilted to one side. The half of the Earth that is tilted towards the Sun gets longer hours of sunlight and has summer. The half that is tilted away from the Sun has lesser hours of sunlight and has winter.

- When the North Pole is tilted towards the Sun, the South Pole is tilted away from the Sun (as in June in the figure). At this time the Northern Hemisphere has summer and the Southern Hemisphere has winter.



poles are at an equal distance from the Sun. In March, therefore, the Northern Hemisphere has spring and the Southern Hemisphere has autumn. In September, the Northern Hemisphere has autumn and the Southern Hemisphere has spring.

- When the South Pole is tilted towards the Sun, the North Pole is tilted away from it (as in December in the figure). Therefore, the Southern Hemisphere has summer and the Northern Hemisphere has winter at this time.
- In March and September, both the poles are at an equal distance from the Sun. In March, therefore, the Northern Hemisphere has spring and the Southern Hemisphere has autumn. In September, the Northern Hemisphere has autumn and the Southern Hemisphere has spring.

Therefore, when it is summer in India, it is winter in Australia, and when it is autumn in India, it is spring in Australia.

Thus, the revolution of the Earth and its tilted axis cause the seasons.

I now know

1. The spinning motion of the Earth on its axis is called rotation.
2. Rotation of the Earth causes day and night.
3. The movement of the Earth around the Sun in a fixed orbit is called revolution.
4. Revolution of the Earth and its tilted axis cause the seasons.

Words to remember

axis: imaginary line along which something spins

orbit: fixed path along which a planet (such as the Earth) rotates around a star (such as the Sun)

tilted: not straight; slanting

hemisphere: half the Earth, below or above the Equator

Exercises

A. Fill in the blanks.

1. The fixed path along which the Earth revolves around the Sun is called its _____ .
2. The part of the Earth facing away from the Sun has _____ (day/night).
3. The imaginary line along which the Earth rotates is called its _____ .
4. Day and night on the Earth are caused by the _____ of the Earth.
5. In the month of June the _____ Pole is tilted towards the Sun.

B. Write T for true and F for false sentences.

1. The Earth takes 24 hours to revolve around the Sun.
2. The hemisphere of the Earth that is tilted away from the Sun gets longer hours of sunlight.
3. When the North Pole is tilted towards the Sun, the Northern Hemisphere has summer.
4. When the Northern Hemisphere has day, the Southern Hemisphere has night.

C. Answer the following questions.

1. How many different types of motions does the Earth have?
2. What is meant by 'rotation' of the Earth? What is the effect of rotation?
3. Why is one day and one night on the Earth of 24 hours?
4. In the month of June it is summer in the Northern Hemisphere and winter in the Southern Hemisphere. Why?
5. Why do the seasons repeat year after year?

Multiple choice questions

1. We see the Sun rising in the east and setting in the west. This happens because
   a. the Earth revolves around the Sun b. the Sun revolves around the Earth
   c. the Earth spins on its axis d. the Sun spins on its axis
2. When the North Pole is tilted towards the Sun,
   a. the Northern hemisphere has summer and the Southern hemisphere has winter
   b. the Northern Hemisphere has winter and the Southern Hemisphere has summer
   c. both hemispheres have summer
   d. both hemispheres have winter
3. The seasons are caused by the
   a. rotation of the Earth b. revolution of the Earth around the Sun
   c. rotation of the Sun d. revolution of the Sun around the Earth

4. You are 10 years old today. You will be 11 after
   a. the Earth completes one rotation on its axis
   b. the Earth completes one revolution around the Sun
   c. the Sun completes one revolution around the Earth
   d. one year – which is not related to the movement of the Earth

HOTS: Think and Answer

- Suppose the axis of the Earth was not tilted. What difference would this have had on the seasons on the Earth?
- The Sun rises in the east and sets in the west. This happens because of the rotation of the Earth. What does this tell us about the direction in which the Earth rotates?

Weblinks

http://www.enchantedlearning.com/subjects/astronomy/planets/
http://www.kidsgeo.com/geography-for-kids/0017-the-earths-movements.php

Enrichment Activities

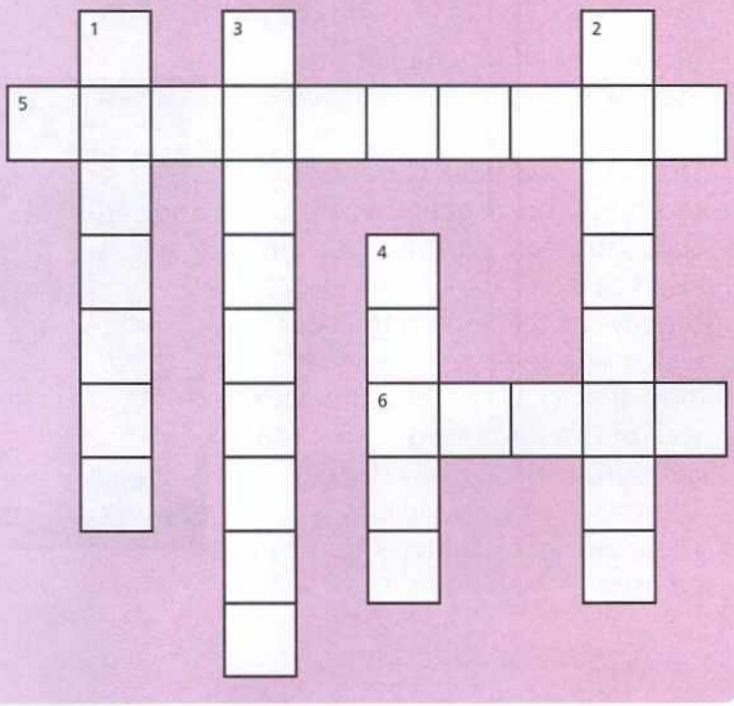
- **Puzzle time:** Solve the puzzle using the given clues.

Down:

1. They are caused by the revolution of the Earth on a tilted axis
2. Spinning around the axis
3. An imaginary line joining the North and South poles of the Earth
4. A model of the Earth

Across:

5. Movement of the Earth around the Sun
6. The path on which the Earth moves around the Sun



- **Write right:** Write a story about life on Earth in the year 3000 (that is, almost a thousand years in the future). What changes do you think would have taken place? Would people have started living on the Moon and on Mars? Would there be any trees left on Earth?
- **Field visit:** Visit an observatory or a planetarium to learn about the Solar System and the movements of the Earth and other planets. Write a report on what you learnt there.
- **Find out:** Why do the North Pole and South Pole have six months of day and six months of night?
- **Project work:** Prepare a chart on the movements of the Earth. Draw and colour the diagrams neatly.

Hands on!

Place a table lamp on the centre of your table. Take off the shade, so that the bare bulb is shown. Light the lamp. With a chalk, draw an ellipse around the lamp. Move a globe around the ellipse. This is the orbit of the Earth. One person can spin the globe to show rotation, while another makes it revolve around the Sun (table lamp). Use this experiment to explain to your class how seasons occur.

Life Skills and Values

Awareness: Never look directly at the Sun

At some point in your life you may have tried to set paper on fire using a magnifying glass. The Sun's rays have enough heat to set fire to the paper when concentrated by a lens. Your eye also has a lens and it concentrates the rays of the Sun on the back wall inside the eye. When you look directly at the Sun, the back wall of the eye, called retina, can get burnt and severely damaged. This can even cause blindness. There are special glasses that can be used to view an eclipse.

Safely watching a solar eclipse through special glasses

4 Climate

Mind opener

- *It is a cold and rainy day and you have to go out. What kind of clothes will you wear? What kind of food or drink would you like to have?*
- *It is a very hot and humid day. What would you like to do during the day? What kind of food or drink would you like to have?*

Looking Ahead

In this lesson you will learn about:

- *The difference between weather and climate*
- *The factors that determine climate*
- *The three heat zones of the Earth*

Weather and climate

Weather is the condition of the atmosphere at a particular place and time. Today might be a cold and rainy day in your city. Tomorrow might be a bright and sunny day. Weather can change from day to day, and even from hour to hour.

Climate, on the other hand, is the average weather condition of a place over a long period of time. The climate in the Himalayan Ranges is cold. It is very cold during most months of the year. The climate in and around Chennai is warm and humid, whereas it is hot and dry in the Thar Desert.

Factors affecting climate

Different places in the world have different types of climate. The climate of a place affects the people living there in many ways. The clothes they wear, the food they eat and the types of houses they live in are all affected by the climate. The factors

A rainy day

A hot and sunny day

A cold day

that determine the climate of a place are:

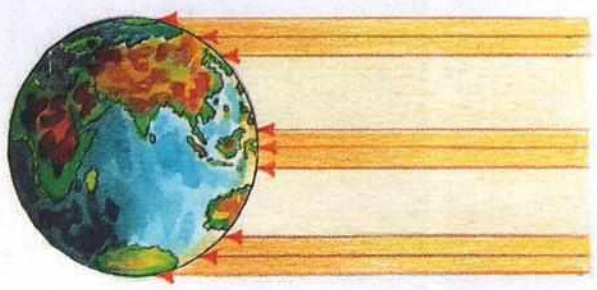
- distance from the Equator
- height above sea level
- distance from the sea
- winds
- the amount of moisture in the air

Latitude (Distance from the Equator)

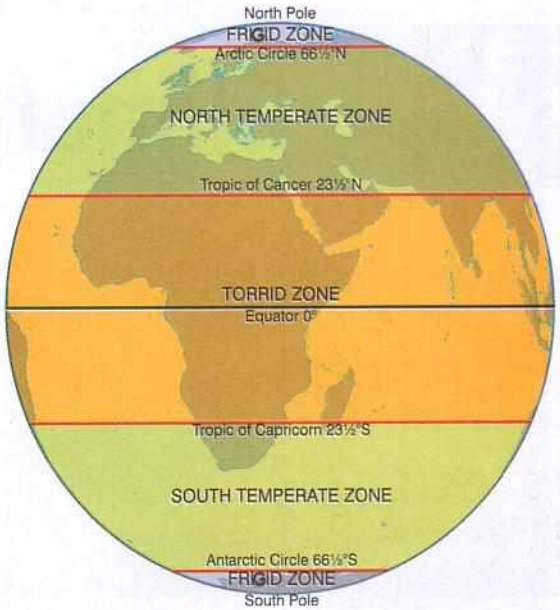
The Earth gets heated by the rays of the Sun falling on it. Look at the diagram below. It shows the same amount of rays from the Sun falling at different parts of the Earth's surface. As you can see, the rays are direct or vertical at the Equator and slanting at the poles. The slanting rays have to heat up a larger area of the Earth's surface than the direct rays that fall on the Equator. Hence, places near the Equator get heated more than places near the poles.

Also, the Sun's rays have to travel a greater distance through the air at the poles than at the Equator, losing in the process a lot of its heat to the clouds, water vapour and dust present in the air.

Different parts of the Earth, therefore, receive different amounts of heat from



The Sun's rays fall directly on the Equator and are slanting at the poles



Climatic zones

the Sun. Depending on the amount of heat received, there are three **climatic** or **heat zones** on the Earth.

The Torrid Zone

The area on both sides of the Equator, between the Tropic of Cancer and the Tropic of Capricorn, is called the **Torrid** or **Tropical Zone**. The word 'torrid' means extremely hot. As it lies near the Equator, this zone receives maximum heat. It is hot throughout the year here.

The Tropical or the Torrid Zone

The Temperate Zones

The areas that lie between the Tropic of Cancer and the Arctic Circle in the Northern Hemisphere, and the Tropic of Capricorn and the Antarctic Circle in the Southern Hemisphere, are called the **Temperate Zones**. This region has a mild climate—neither very hot nor very cold.

A temperate forest in Australia

The Frigid Zones

The areas between the Arctic Circle and the North Pole in the Northern Hemisphere, and between the Antarctic Circle and South Pole in the Southern Hemisphere, receive very little heat from the Sun. They are very cold, and large parts are covered with snow throughout the year. They are called the **Frigid Zones**.

Life in the Frigid Zone: Polar bears walk on ice in the Arctic Ocean

Did you know?

The North and South Poles experience 6 months of day and 6 months of night! Places within the Arctic Circle, like parts of Norway and Greenland, where the Sun stays in the sky through the night and day, are known as the Land of the Midnight Sun.

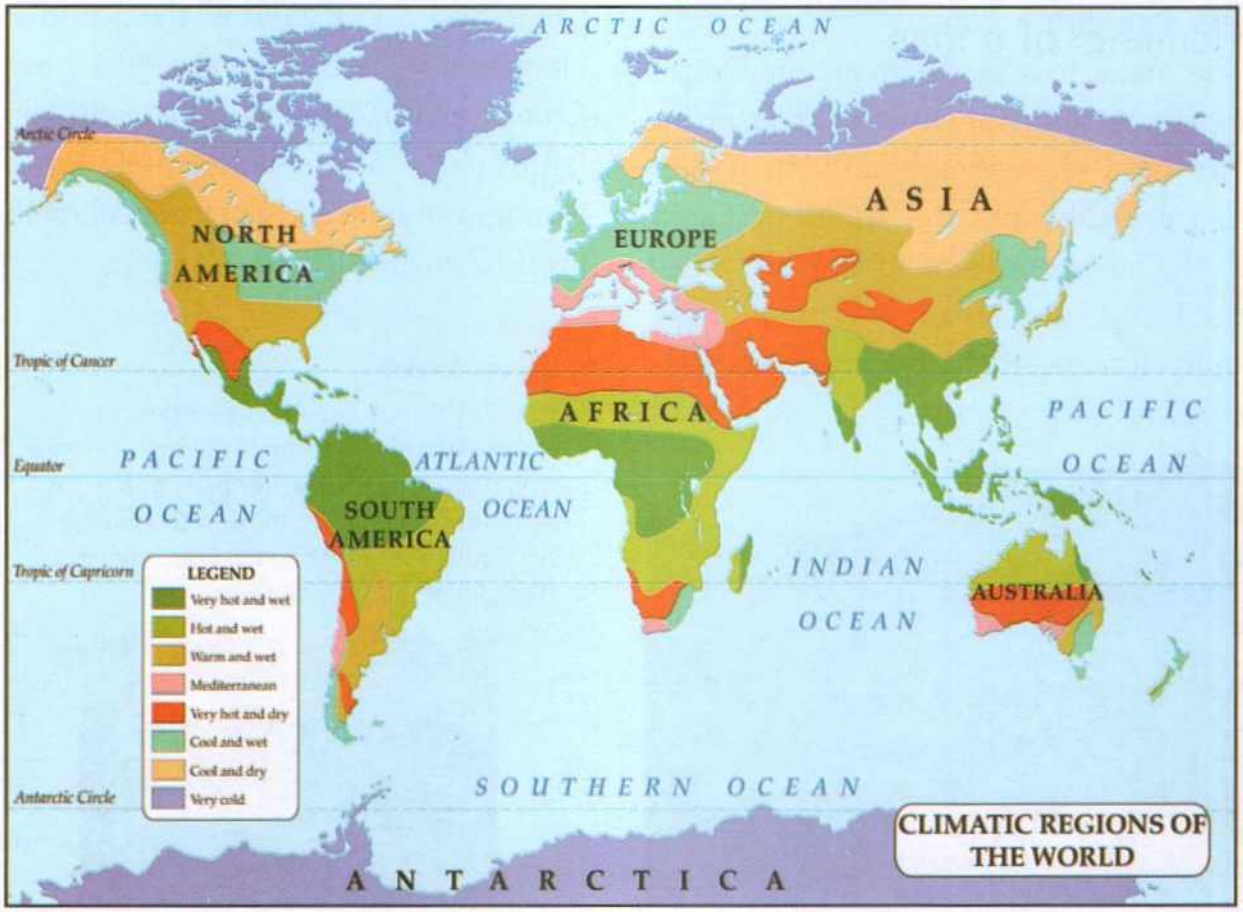
The Sun shining at midnight, Norway

Height above Sea Level

Have you visited a hill station? You know that it is cooler up in the hills than in the plains, even if the two places are the same distance away from the Equator. The higher you go, the cooler it becomes. The peaks of high mountains are covered with snow throughout the year. Thus, the higher a place is from sea level, the cooler is its climate.

Distance from the Sea

Water heats up and cools more slowly than land. This affects the climate of places near the sea. They are warmer



in winter and cooler in summer than places far away from the sea. For example, Mumbai is closer to the Equator than Delhi. We can therefore, expect it to be warmer than Delhi during summer. But this is not so, because Mumbai is situated on the sea coast. This makes its climate moderate.

Winds

Winds tend to flow in particular directions in different parts of the world. They may be hot, cool, dry, or full of moisture, depending on where they come from. For example, the monsoon winds from the Indian Ocean and Arabian Sea bring rain to large parts of India. The hot winds from the Thar Desert make Delhi very hot during summer. Thus, the climate of an area is affected by the winds.

Humidity

Humidity is the amount of water vapour in the air. It affects the climate of a place. The air over the Equator is laden with water vapour, as the heat of the Sun here causes rapid evaporation of the ocean waters. This causes heavy rain in the area. So the climate near the Equator is hot and wet. Deserts are formed in places where there is very little humidity, and so very little rain, throughout the year.

Did you know?

Scientists who study and predict the weather are called meteorologists. They often use satellite pictures of the Earth to predict the weather. You may have seen such satellite pictures on weather bulletins on the television.

A satellite-generated weather map of South-East Asia

I now know

1. Weather is the condition of the atmosphere at a particular place and time.
2. Climate is the average weather condition of a large area over a long period of time.
3. The factors that determine the climate of a place are latitude, height above sea level, distance from the sea, winds and humidity.
4. Places near the Equator receive maximum heat from the Sun. It reduces as we move toward the poles.
5. The Earth can be divided into three climatic zones depending on the amount of heat received from the Sun—torrid, temperate and frigid zones.
6. The higher a place is from sea level, the cooler it is.
7. Places near the sea coast have a moderate climate.
8. Winds and the amount of humidity in the air affect the climate of a place.

Words to remember

climate: average weather conditions of a place over a long period of time
humidity: the amount of water vapour in the air
predict: to tell what is going to happen in the future

Exercises

A. Fill in the blanks.

1. The condition of the atmosphere at a particular place and time is called _____ .
2. The rays of the Sun fall vertically on land near the _____, but are slanting near the _____ .
3. The heat zone within which the Equator lies is the _____ zone.
4. The heat zone farthest from the Equator is the _____ zone.
5. The heat zone which enjoys a mild climate is the _____ zone.
6. The amount of water vapour in the air is known as _____ .
7. As we go up on a mountain, it becomes _____ (cooler/warmer).

B. Write T for true and F for false sentences.

1. Climate changes from day to day.
2. The air in deserts has low humidity.
3. During the summer months, days are longer near the Equator than far away from it.
4. Most places in the Temperate Zone have a mild climate.
5. The climate near the Equator is hot and wet.

C. Answer the following questions.

1. What is the difference between weather and climate?
2. How does the climate of a place affect the people living there?
3. Name the five important factors that determine the climate of a place.
4. Why do areas near the Equator receive more heat from the Sun, than those near the poles?
5. Where are the following heat zones located? Describe the general climate of each zone.
   (a) Frigid Zones; (b) Temperate Zones; (c) Tropical Zone
6. How do winds affect the climate of a place?
7. How is the humidity in Chennai different from that of Jaisalmer in the Thar Desert?

HOTS: Think and Answer

- If you stand in the Sun, you feel warmer at noon than in the mornings or evenings. Why?
- Delhi is further away from the Equator than Chennai. But summer in Chennai is not as hot as in Delhi. What are the reasons for this?

Multiple choice questions

1. The climate of a place is affected by
   a. distance from the Equator b. humidity
   c. height above sea level d. all of these
2. Which of these zones receive the maximum heat from the Sun?
   a. Tropical zone b. Frigid zone c. Temperate zone
   d. All of these receive equal amounts of heat
3. A city is expected to have a moderate climate if it is
   a. near the Equator b. near the sea c. near the mountains d. near the Poles
4. If the latitude of a place is 30° N, it lies in the
   a. Tropical zone b. North Temperate Zone
   c. Frigid zone d. South Temperate Zone
5. A city lies on the Equator. It is located on the plains, far away from the coast. Its climate is expected to be
   a. hot throughout the year b. cold throughout the year
   c. hot in summers and cold in winters d. neither very hot nor very cold

Enrichment Activities

- **Speak out:** Which is your favourite season? What do you like about it? Share your feelings with your classmates.
- **Write right:** Your friend lives in Australia. She is coming to India to spend some time with you. She wants to know more about the climate here so that she can buy clothes accordingly. Write her a letter describing the climate of the place where you stay. Remember to write about the climate and not the weather.
- **Art work:** Paint a picture of either a rainy day or a hot day in summer.
- **Map work:** Look at the map of the world showing the heat zones on the Earth.
  - Write down the names of 5 countries in each of the zones.
  - Write down the names of 5 cities of India in the different zones in which India lies.
- **Project work:** Work in groups. Find out the weather report for your city, from the newspaper, TV or the Internet (see web links above). Note it down in your scrap book. Do this every day for a month.
  - Note the daily changes in maximum and minimum temperature, humidity, clouds and rain. What was the highest temperature for that month?
  - What was the lowest temperature?
  - How much of rain fell? Or was it a dry month with no rainfall?
  - What was the percentage of humidity?
  - Based on these reports can you say what the season is?
  - Find out about the climate of the place where you stay.

Hands on!

Measuring the outside temperature using a thermometer

How many of you have seen a thermometer? A thermometer is an instrument used to measure temperature. It tells us how hot or cold a thing or a place is.

Ask your teacher to teach you to read a thermometer.

Now place a thermometer outside in a shady place, away from direct sunlight. Take temperature readings at every hour and write them down in your notebook. Then answer these questions.

- What was the temperature at 9 am?
- What was the temperature when you were leaving for home?
- How did the temperature change during the day?
- What was the warmest time of the day?

Discuss your findings with your classmates. Why does the temperature change during the day? Think and answer.

Life Skills and Values

Being an informed traveller

You live in Delhi. Suppose you are going on a trip to Kerala in January (it is very cold in Delhi in January). What kind of clothes will you pack for the trip? Will you pack heavy woollens or light cottons?

The clothes you pack will depend on the weather in the place you are going to. You can find out about the weather in Kerala from the weather report in newspapers, TV or the Internet. Whenever you undertake a trip, make it a point to find out about the weather conditions at your destination, and pack accordingly.

5 DRC — The Land of Dense Forest

Mind opener

The Equator passes through a country. What kind of climate do you expect it to have?

Looking Ahead

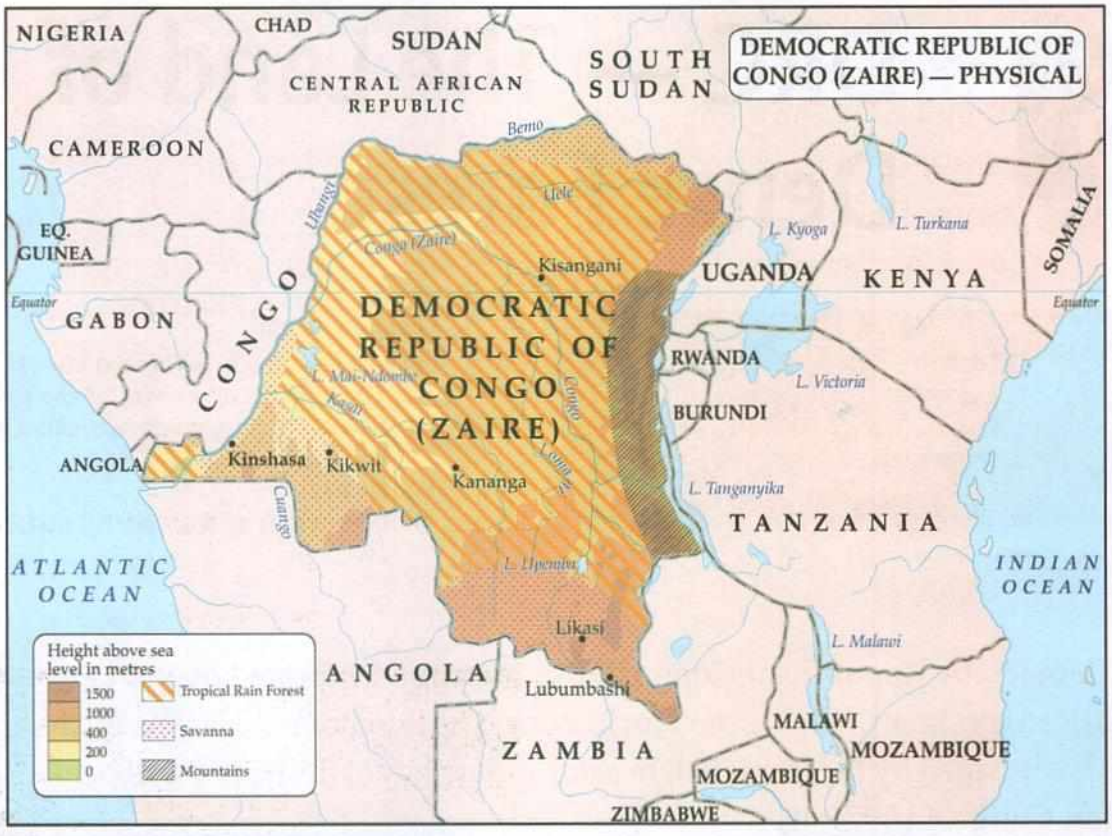
In this lesson you will learn about:

- *The climate and relief of the DRC*
- *Its vegetation, wildlife and natural resources*
- *Its people*
- *The means of transport found in the DRC*

The Democratic Republic of Congo (DRC) is a country located deep in the heart of the African continent. It lies in the Torrid Zone. The Equator passes through Northern DRC. It was ruled by Belgium till it became independent in 1960. It was earlier called **Belgian Congo**. In 1971, its name was changed to **Zaire**. Once again, in 1997, its name was changed to the Democratic Republic of Congo, which is its present name. Its capital is **Kinshasa**.

Relief

The landscape of the country is dominated by the **Congo River**. It is the second longest river in Africa, and the seventh longest in the world. The Congo Basin covers almost the entire country. There are high mountains in the eastern edges of the DRC, and plateaus in the south and south-west.



The Congo River flows through dense rainforests in the DRC

Climate

Being near the Equator, the climate in most parts of the DRC is very hot throughout the year. The rapid evaporation of water due to the high temperature during the day, leads to high levels of humidity. This causes clouds to build up and heavy rains occur by afternoon. This happens almost every day, making the region one of the wettest in the world.

In some parts of the DRC, especially in the south, it does not rain so much. While the summer is hot and wet, the winter is cool and dry.

Vegetation

The hot and humid climate of the DRC is ideal for the growth of dense forests called **tropical rainforests**. Rainforests

cover most of the DRC. They are evergreen forests—the trees of the forest are covered with leaves throughout the year. There are a large variety of trees and other plants. The trees are tall and form a canopy of leaves at the top. This prevents sunlight from passing through. Creepers, climbers and shrubs grow below. However, at several places the canopy is so thick that very few plants can grow under it.

The rainforest

Did you know?

The Congo rainforest is the second largest in the world, after the Amazon rainforest.

Zebras grazing in the savanna

In some parts of the DRC, mostly in the south, where the climate is not so hot and wet, the vegetation is different. Instead of dense forests, there are grasslands with a few scattered trees. Such open grasslands are called savanna.

Wildlife

A large variety of wildlife is found in the forests and savannas of the DRC. Elephants, buffaloes, gorillas, chimpanzees, baboons, hippopotamuses and rhinoceros are some mammals

The rarely seen pygmy hippopotamus lives in the western parts of the rainforest.

The Congo African Grey Parrot is one of the most intelligent birds.

found in the forests. Lions, leopards, giraffes, zebras, wolves, elephants and chimpanzees, roam the savannas.

Crocodiles are found in plenty in the rivers. There are many types of birds and insects in the forests. Among the insects is found the tsetse fly, which causes the dreaded sleeping sickness.

Natural Resources

DRC has rich natural resources. There are vast deposits of copper, cobalt, gold, uranium and diamonds in Southern DRC. It has the world's largest deposits of cobalt. Most of the minerals are exported.

With about 45 per cent of the land covered with forests, DRC has one of the best forest resources in Africa.

Water is another important natural resource. Dams built on the rivers produce electricity.

Agriculture

Farming is done in large areas from where forests have been cleared. The major food crops grown are cassava, maize and rice. Coffee, cocoa, rubber and cotton are also grown, and most of these are exported.

The People

DRC is thinly populated. Most people live in villages in the highlands in the east, and along the rivers. About 43 per cent of the people live in cities. Modern facilities are available in cities. The rich city dwellers live in houses and apartments, and drive cars. But the poor live in crowded, unhealthy conditions in slums.

In the villages, people live in thatched huts in separate **tribes** or groups, each having its own customs. There are about 200 tribes in the DRC.

Some tribes, such as the Bambuti, Twa and the Babinga, are composed of people who are short in height. They traditionally get their food by hunting animals and gathering plant foods. They live in camps, which they occupy for only a few weeks. Then, they move to a new place. They make huts out of branches and leaves.

Since the weather is hot and humid, the people of these tribes do not wear many clothes. But on special occasions, they wear colourful costumes. They enjoy singing, dancing and telling stories. However, their existence is threatened

Members of a tribe with their hunting nets

Did you know?

The DRC is believed to be the richest country in the world in terms of natural resources. Yet the people of this country are one of the poorest in the world. The country has seen several wars in which millions have died.

A tribal dwelling

A traditional dance of the Baka people

by widespread deforestation. Forest lands are being cleared for timber, and for setting up large oil palm and rubber tree plantations.

Transport

Rail and road connect cities with each other, but land transport is not so well developed. Water transport over the river Congo and other rivers is the major means of transport.

Kinshasa, the capital, is built on the banks of the river Congo.

Did you know?

Three species of great apes live in the DRC. These are the common chimpanzee, the bonobo and the gorilla. It is the only country in the world in which bonobos are found in the wild. They are also called dwarf chimpanzees. They are endangered animals and their estimated population is only about 10,000.

I now know

1. The Democratic Republic of Congo (DRC) is located in the Tropical Zone, in Central Africa.
2. The DRC has a hot and wet climate.
3. Most parts of DRC are covered with tropical rainforests. Some parts are covered with savanna.
4. DRC is rich in mineral and forest resources.
5. Most people live in villages. The DRC is home to over 200 tribes.

Words to remember

savanna: a large flat area of grassland with scattered trees, found in warm parts of the world

canopy: (here) continuous cover of tree

exported: sent to another country for sale

tribe: a large group of people who live in the same area and share a common language, religion and customs

Exercises

A. Fill in the blanks.

1. The capital of the Democratic Republic of Congo is _____ .
2. DRC is situated in the Tropical Zone, in the continent of _____ .
3. The longest river of DRC is _____ .
4. Most of DRC is covered with _____ forests.
5. Vegetation consisting of grasslands with short trees is known as a _____ .

B. Write T for true and F for false sentences.

1. Most people in DRC live in cities.
2. It rains almost every day in the tropical rainforests of DRC.
3. Savannas are grasslands.
4. DRC exports most of its minerals.

C. Answer the following questions.

1. What was/is DRC known as: (a) before 1971, (b) between 1971 and 1997, (c) at present?
2. What kind of climate does DRC have?
3. Describe a tropical rainforest.
4. Why is most of the DRC covered with tropical rainforests?
5. What is a savanna? Which parts of the DRC have this type of vegetation?
6. Name four animals found in plenty in the tropical rainforests, and four found in the savannas.
7. Which dangerous insect present in the forests of the DRC causes sleeping sickness?
8. Describe the way the tribes of the DRC live.

Multiple choice questions

1. From 1971 to 1997, DRC was known as
   a. Zaire b. Belgian Congo c. Congo-Kinshasa d. Congo Free State
2. In the part of DRC near the Equator, it rains
   a. during the rainy season—June to September
   b. during winter—October to February
   c. almost every day throughout the year
   d. does not rain at all as it is very hot
3. Other than tropical rainforests, DRC also has
   a. grasslands b. deserts c. snow covered lands d. salt water lakes
4. Sleeping sickness is caused by:
   a. housefly b. tsetse fly c. cockroach d. flea
5. The main source of income of DRC is:
   a. tourism
   b. export of minerals and agriculture produce
   c. export of goods produced in large factories
   d. export of meat products

HOTS: Think and Answer

- If the people of DRC were to use the minerals they mine to manufacture things and then export them, they would earn more money. Why do you think they export minerals?

Weblinks

http://news.bbc.co.uk/2/hi/africa/country_profiles/1072684.stm - main events in the history of DRC

http://www.lonelyplanet.com/democratic-republic-of-congo

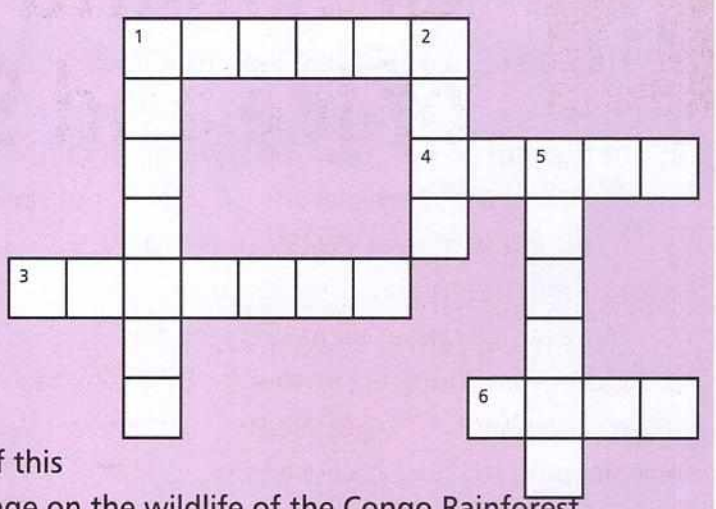
Enrichment Activities

- **Let's debate:** Have a debate in class on the topic: 'Is rapid development more important than the need to save our forests and wildlife?'
- **Write right:** Imagine that you are member of one of the tribes of the DRC. Write a paragraph describing a day in your life.

- **Puzzle time:** Fill in the names of the important minerals and crops of DRC.

  Across
  1. the DRC has rich deposits of this mineral
  3. a shiny, hard mineral
  4. it is used to make chocolate
  6. used for ornaments

  Down
  1. one of the main crops grown in the DRC
  2. a cereal crop
  5. we wear clothes made out of this



- **Art work:** Make a poster or a collage on the wildlife of the Congo Rainforest.
- **Find out:** Like the nomadic groups of the DRC, there are groups of people in India too who move around from place to place. Find out what they are called and which part of India they come from.
- **Project work:** Work in groups. Find out more about the history, geography and the people of the DRC and present your findings in the form of a presentation or a project report.

Hands on!

Watch a video of an African dance and try to learn it. Form groups and perform the dance in class. You could visit these sites:

https://www.youtube.com/watch?v=QGPWSFeITEA

https://www.youtube.com/watch?v=P7jX9eNEz4s

You could also learn an African song and sing it in class.

Life Skills and Values

Role play; critical thinking

Imagine you are a bonobo living in the rainforest of Congo. People are cutting down trees on a large scale. You are hungry most of the time as food is difficult to find. Many of the other bonobos have been captured and sent to the zoo.

What would you do? If you could talk to the captors, what would you say to them?

6 Greenland — The Land of Ice and Snow

Mind opener

Greenland is a country whose northern part is close to the North Pole. Do you think plants or animals can live here, or is it a land of only ice and snow?

Looking Ahead

In this lesson you will learn about:

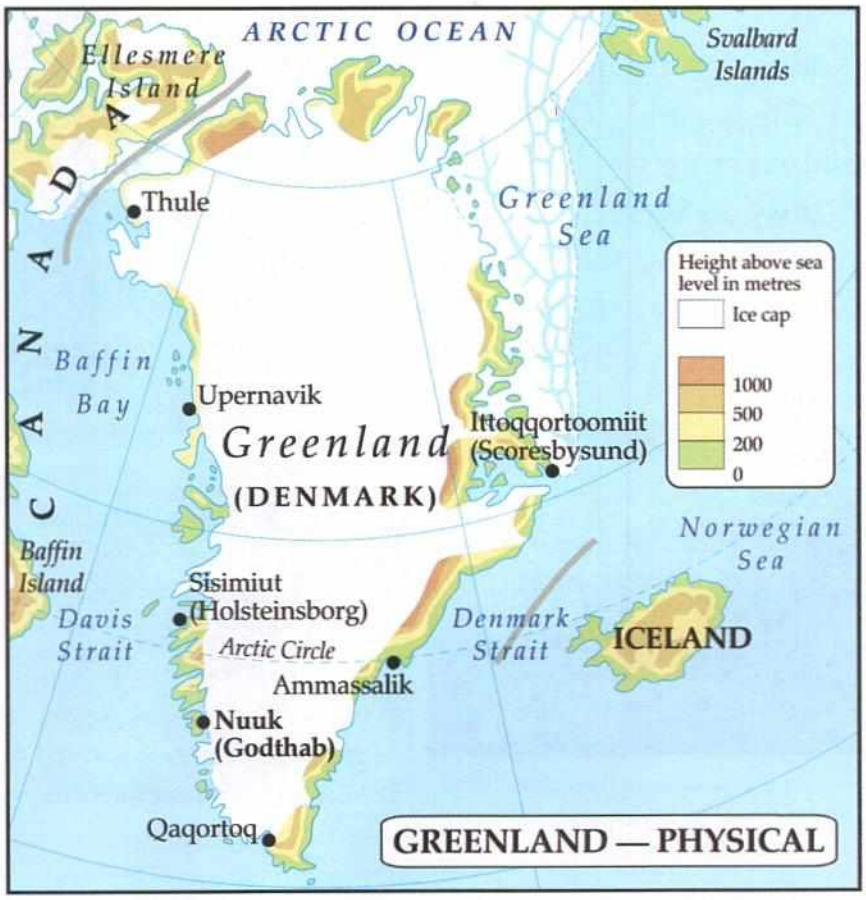
- *The location and climate of Greenland*
- *Its vegetation and wildlife*
- *Its people; and its agriculture and industry*

Greenland is the largest island in the world that is not a continent. It is a self-governing province of Denmark, and its capital is **Nuuk**, earlier known as **Godthab**. The first European who visited Greenland was an explorer called **Eric the Red**. He gave the island its name.

Climate

The Arctic Circle passes through the southern part of Greenland. Most of Greenland therefore lies in the Frigid Zone in the Northern Hemisphere. You have already read that this region has a very cold climate. The region is also known as the **Tundra region**.

Eighty per cent of Greenland is always covered with ice. Huge pieces of ice frequently



break off and float in the sea. They are called **icebergs**. They pose great danger to ships in the sea.

The south-western coast of Greenland is the warmest part of the country. Most of the people live here.

Most of Greenland is covered in ice and snow

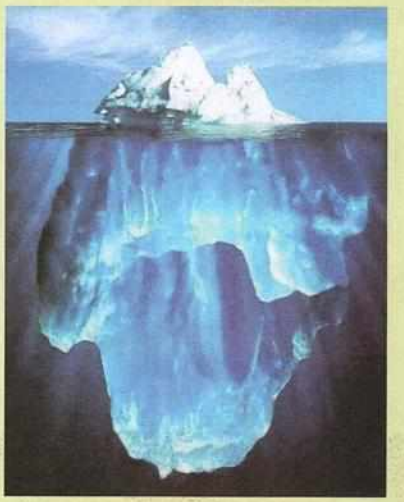
Vegetation and Wildlife

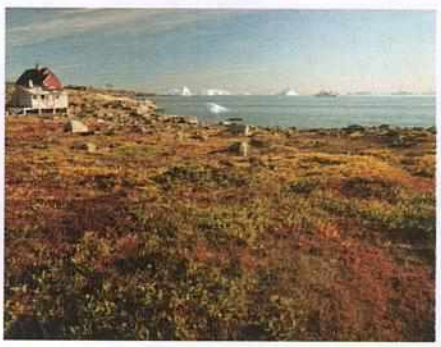
Nothing grows in the ice-covered areas of Greenland. There are no forests, and no crops can be grown here. Some plants can be seen during the summer months. Only those animals that can withstand the extreme cold are found in Greenland. Among them are the polar bear, reindeer, musk ox, wolf, arctic fox and seal. Several varieties of fishes and sea birds are also found here.

Seals

Did you know?

Icebergs are actually much larger than they seem. This is because when an iceberg floats on water, most of it remains under water.





Plants like sedge, cotton grass, and lichen grow in Southern Greenland during the summer months.

Reindeer

Polar bear

The People

The **Inuit** were the original inhabitants of Greenland. They are mainly hunters, and live by fishing and hunting animals found in the region.

The skin and fur of the animals are used to make clothes. The fat is used as fuel. Earlier, they used bows and harpoons to hunt. But now they use guns. In the past, the Inuit were **nomadic**, that is, they used to roam around throughout the year to hunt. They used sledges pulled by dogs for transport. They used boats called **kayaks** for fishing in the sea.

While roaming around, the Inuit used to live in temporary houses made of blocks of ice. We call these houses **igloos**. However, to the Inuit 'igloo' meant a house—whether made of ice or wood or bricks. In the summer, the Inuit moved into leather tents.

Most Inuit now lead a settled life. They live in small villages or towns on the sea coast.

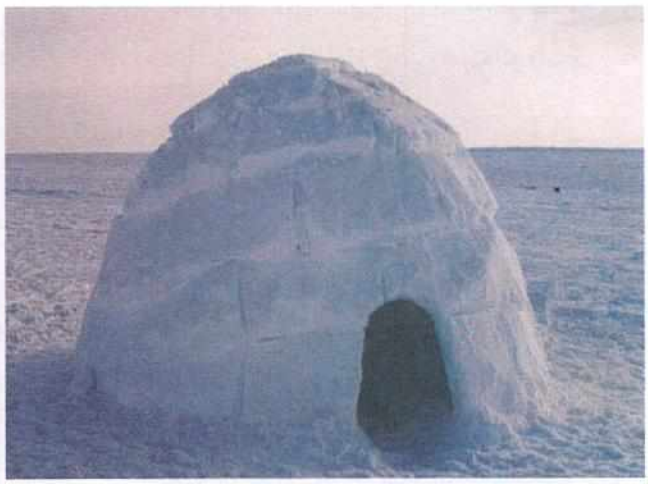
They go on hunting trips which may last for several days. They have fast motorised sledges for transport. They use motor boats for fishing.

The people wear clothes made of animal skin and fur. They wear jackets with hoods lined with fur, called **parkas**. Long boots made of seal skin keep their feet warm in the snow.

Today, Greenland has a mixed population, consisting mostly of Inuit and Europeans. The total population is only about 56,000—less than the population of a large town in India! Hunting and fishing continue to be two of the most important occupations of the people.

Almost the entire population lives on

An Inuit family in fur-lined parkas



An igloo

the south-western coast. There are towns with modern facilities such as electricity, permanent houses, schools and hospitals. The capital Nuuk is the biggest town with a population of about 15,500. Sisimiut is the second biggest. It has a population of about 5,500 people.

Agriculture and Industry

Fish processing is the major industry in Greenland. Sheep are raised in small numbers in the south-western coast. A very small portion of land in the south-west is suitable for agriculture, and some vegetables such as potatoes are grown.

The city of Nuuk seen from the air

Inuit seal-hunter in a kayak, armed with a harpoon (a kind of spear)

I now know

1. Most of Greenland lies in the Tundra region and is always covered with ice.
2. Animals, fish and birds that can withstand the extreme cold are found in Greenland.
3. Inuit were the original inhabitants of Greenland.
4. Most people in Greenland live on the south-western coast.
5. The capital Nuuk is the biggest town with a population of about 15,500 people.
6. Fish processing is the major industry of Greenland.

Words to remember

iceberg: a very large piece of ice floating in the sea
tundra: a large flat area of frozen land lying around the North Pole
kayak: a narrow boat that is moved with a single paddle, flat at both ends
igloo: a house made of snow or ice

Exercises

A. Fill in the blanks.

1. The capital of Greenland is _____ , earlier called _____ .
2. The Frigid Zone in which most of Greenland is situated is also called the _____ region.
3. Huge pieces of ice floating in the sea are known as _____ .
4. The original inhabitants of Greenland are the_____ .
5. _____ are temporary houses made of blocks of ice by the Inuit.

B. Match the columns.

1. Eric the Red	a. boats
2. Sisimiut	b. warmest part of Greenland
3. Arctic Circle	c. gave the name 'Greenland'
4. South-western coast	d. passes through Greenland
5. Kayaks	e. town in Greenland

C. Answer the following questions.

1. What kind of climate does Greenland have?
2. What are icebergs? In what ways are they dangerous?
3. Describe the wildlife of Greenland.
4. What is the main occupation of the Inuit?
5. What kind of clothes do most people in Greenland wear?
6. How have modern facilities changed the lives of the Inuit?

Multiple choice questions

1. Most of Greenland lies
   a. north of the Arctic circle b. between the Tropic of Cancer and the Arctic Circle
   c. between the Equator and the Tropic of Cancer d. south of the Antarctic Circle
2. The main occupations of the people of Greenland include
   a. farming b. fishing and hunting
   c. working in large factories producing cars
   d. selling forest produce such as timber
3. Traditionally, the clothes worn by the Inuit were mostly made of
   a. cotton b. silk c. skin and fur d. wool
4. The original inhabitants of Greenland were the:
   a. Europeans b. Inuit c. Americans d. Indians

5. The population of Nuuk, the capital of Greenland, is about:
   a. 15,500
   b. 1,50,500
   c. 1,500,500
   d. 15,000,500

HOTS: Think and Answer

- Why do you think the Inuit were nomadic? Why didn't they settle down in one place?
- More people live in the south of Greenland than in the north. Why do you think this is so?

Enrichment Activities

- **Speak out:** Find out and speak about Global Warming. How do you think it will affect the life of the people of Greenland?
- **Project work:** Find out more about the history, geography and the people of Greenland and prepare a presentation or a project report on Greenland. Include pictures.
- **Find out:** The Titanic was a famous ship that sank in the sea after hitting an iceberg over 100 years ago. Find out all you can about the ship and its voyage.

Hands on!

Take a large ice cube and put it in a glass of water. Does it float or sink in water? Observe how much of it is below the water surface. Isn't most of it below the water surface? It is the same with an iceberg.

Life Skills and Values

Protecting the environment

Global Warming and climate change may soon force the Inuit people of northern Greenland to abandon their icy home and traditional way of life. What is Global Warming? Find out more about it. How can each of us help to reduce Global Warming? Share your thoughts with your classmates.

7 Saudi Arabia — The Land of Hot Sands

Mind opener

In the olden days, most of the people who lived in deserts were nomads, that is, they kept moving from place to place. Why do you think this was so? Do you think we still have nomads in the deserts today?

Looking Ahead

In this lesson you will learn about:

- *The land and climate of Saudi Arabia*
- *Its vegetation and crops*
- *Its people*
- *Its religious importance*

Saudi Arabia is a large country situated in the Arabian Peninsula. A **peninsula** is a piece of land jutting out into the sea. It is surrounded by water on three sides.

The Arabian Peninsula is the largest peninsula in the world. It lies between the Red Sea on the west and the Persian Gulf (also called the Arabian Gulf) on the east. The capital of Saudi Arabia is **Riyadh**.

Land

Most of Saudi Arabia is a high rocky plateau covered by a vast desert. The desert is covered with small hills of sand called **sand dunes**. Strong winds and dust storms keep blowing and shifting these sand dunes from one place to another. There are no lakes or rivers in this land. But at some places in the desert, underground water comes to the surface forming fertile areas called **oases**.

Sand dunes in the Arabian Desert

Climate

The Tropic of Cancer passes through the middle of Saudi Arabia. The climate of Saudi Arabia is hot and dry. The country gets very little rainfall, the humidity is very low, and the Sun shines bright and hot throughout the year. You have read in the chapter on 'Climate' that these are conditions in which hot deserts form.

The nights are cool, as the sand in the desert cools down quickly at night. During winter, the nights are very cold.

Vegetation and Agriculture

Very few plants can grow in a desert climate. Cacti and some short shrubs, which can withstand the hot and dry conditions, can be seen growing in the desert regions of Saudi Arabia.

Date palms and some crops such as wheat and barley are grown in the oases.

The Al-Hasa is the largest oasis in Saudi Arabia

Did you know?

Saudi Arabia is one of the world's largest producers of petroleum. However, it is the biggest exporter of petroleum.

Drilling for petroleum in Saudi Arabia

Saudi Arabian women in abaya and niqaab

The People

Saudi Arabia has vast deposits of petroleum, a resource that is in great demand around the world. The revenue earned from the sale of petroleum has helped the country develop rapidly. Most of the people living here enjoy a high standard of living. The cities of Riyadh and Jeddah, in particular, have excellent infrastructure. A large number of Indians work in Saudi Arabia.

The society in Saudi Arabia is largely traditional. Saudi Arabia has a monarchy, and is ruled by a king. The women wear the **abaya** when they go out—a robe that is worn over their clothes and covers them from head to toe. Some women also cover their faces with a niqaab.

Most men wear the traditional loose fitting white robes called **thobe**. Their heads are covered with a white or red checkered cloth, held in place by a ring.

Traditionally, large groups of people in Saudi Arabia were nomads, moving

Men in the white robes and headscarves (Picture credit: Bryeunade)

from place to place in search of pastures for their flocks of goats, sheep and camel. These nomadic people are called the **Bedouin**. Their main occupation is pastoralism (rearing livestock).

They live in tents made of animal skin. They sell animals and their products at market places in villages and buy things like food grains, dates and clothing in exchange.

The lifestyle of the Bedouin people is changing now. More and more of them are beginning to settle down in one place, and use jeeps and cars for moving around.

A Bedouin family inside their tent

Industry

Saudi Arabia has several large industries, of which the main are petroleum refining, and its associated industries like fertilisers and plastics. Other important industries include iron and steel, cement, and construction.

Religious Importance

The religion Islam originated in Saudi Arabia around 1400 years ago. Millions of **Muslims** (as followers of Islam are called) from all over the world come to **Mecca**, the most important pilgrim centre of the Muslims. **Medina** is another important religious centre here.

Saudi Arabia is an excellent example of a hot and barren desert being changed into a rich and prosperous land through the careful use of its resources. The government of Saudi Arabia has used the natural resources found in the country intelligently to benefit the people.

People offering prayer or namaz at the Great Mosque in Mecca

Did you know?

Saudi Arabia is an Islamic state. That means its official religion is Islam. This is different from India, which is a secular state – there is no official religion in India. Every citizen is free to follow whatever religion he/she chooses.

I now know

1. Most of Saudi Arabia is a hot and dry desert.
2. Only cacti and some shrubs grow in the desert.
3. The land around oases is used for agriculture.
4. Saudi Arabia is a rich country because of vast deposits of petroleum.
5. Saudi Arabia has modern cities but the society is traditional.
6. The nomads of Saudi Arabia are called Bedouins.
7. Mecca and Medina, the two important Muslim religious centres in Saudi Arabia, are visited by millions of Muslims every year.

Words to remember

dune: small hills of sand that keep shifting due to strong winds

petroleum: oil found under land or sea, used to make petrol, diesel, kerosene and many other products

Bedouins: nomadic Arabs living in the desert in tents

oasis: fertile area formed in the desert by underground water that comes to the surface

Exercises

A. Write T for true and F for false sentences.

1. Saudi Arabia has a temperate climate as most of it lies in the Temperate Zone.
2. Traditionally, large groups of people in Saudi Arabia were nomads.
3. Nights in Saudi Arabia are hot.
4. Sand dunes are hills of sand that remain fixed in their places.
5. In an oasis, underground water comes up to the surface.
6. The main income of Saudi Arabia comes from petroleum.
7. Saudi Arabia has a very modern society.

B. Give one word answers for the following.

1. The capital of Saudi Arabia: _____
2. Hills of sand that keep shifting because of strong winds: _____
3. Nomads of Saudi Arabia: _____
4. The most important pilgrim centre of the Muslims: _____
5. The main natural resource of Saudi Arabia: _____

C. Answer the following questions.

1. Describe the climate of Saudi Arabia.
2. What kinds of plants grow in the deserts of Saudi Arabia?
3. What is a (a) peninsula, (b) oasis?
4. What is the importance of oases for the people living in the desert regions of Saudi Arabia?
5. Why is Saudi Arabia such a rich country?
6. Who are Bedouins?
7. How did Bedouins traditionally earn their living?
8. Why is Saudi Arabia important for the Muslims of the world?

Multiple choice questions

1. Saudi Arabia lies partly in the Tropical Zone and partly in the Temperate Zone. Its climate can best be described as
   a. tropical (hot and wet)
   b. temperate (neither very hot nor very cold)
   c. hot and dry
   d. cold and dry
2. Saudi Arabia is a rich country because
   a. it has a very fertile land
   b. it has huge industries and exports several products
   c. it has large deposits of petroleum which are exported
   d. a large number of tourists visit the country every year
3. The official religion of Saudi Arabia is
   a. Hinduism b. Islam c. Christianity d. it has no official religion
4. Which of these is an important pilgrim centre for Muslims?
   a. Riyadh b. Mecca c. Jeddah d. all of these

Weblinks

http://www.infoplease.com/ipa/A0107947.html
http://news.bbc.co.uk/2/hi/south_asia/country_profiles/791936.stm

HOTS: Think and Answer

- Why do you think the population in Saudi Arabia is low?
- Clothes that men and women in Saudi Arabia normally wear cover their entire body including the head. Can you think of any advantages of such a dress? (Hint: Think of the blazing Sun and sandstorms.)

Enrichment Activities

- **Speak out:** Petroleum, as you have learnt, is a non-renewable resource. What are the different ways in which we can help preserve this precious natural resource? Share your thoughts with your classmates.
- **Write right:** Write an essay on the topic, 'A world without oil.' Imagine a world a few years in the future when we have finally exhausted our reserves of petroleum.

- **Art work:** Make a model of an oasis.
- **Find out:** Find out more about the life of women in Saudi Arabia. Compare it with the life of women in India.
- **Project work:** Find out more about the history, geography and the people of Saudi Arabia and make a project or a website on Saudi Arabia. Include pictures.

Hands on!

Collect some sand and some garden soil. Examine both carefully. Which one has bigger particles?

Wet them both and let them dry in the Sun. Which one dries out faster?

Life Skills and Values

Protection from the Sun

During summers it becomes very hot in most parts of India. To avoid heat related illness, here are some necessary precautions.

- Drink plenty of fluids—don't wait until you're thirsty to drink.
- Avoid hot food and heavy meals.
- Playing games or exercising in hot weather leads to heavy sweating, which removes salt and minerals from the body. Drinking water with some salt and sugar added to it will help.
- Wear light-coloured, loose-fitting cotton clothing. If you must go outdoors, protect yourself from the Sun by wearing a cap (or carry an umbrella).

The capital city, Riyadh

8 Grasslands of the Temperate Zone

Mind opener

Why are grasslands the most endangered habitats—even more so than forests which are cut down for farmland and timber? (Think – which kind of land is easier to convert into farmland – forest or grassland?)

Looking Ahead

In this lesson you will learn about:

- *The grasslands of North America—the prairies*
- *The vegetation and the climate of the prairies*
- *Agriculture and animal husbandry in the prairies*

Grasslands are vast stretches of land covered with tall grasses and a few scattered trees. Grasslands cover more than one-fifth of the Earth's land surface. Most of these grasslands are located in the Temperate Zone. As you have read earlier, the Temperate Zone lies between latitudes 23½° N and 66½° N in the Northern Hemisphere, and between latitudes 23½° S and 66½° S in the Southern Hemisphere. The grasslands are known by different names in different parts of the world.

- **Prairies** in North America
- **Pampas** in South America

Did you know?

Grasslands are natural habitats that have been formed by nature. The grasses found here have not been planted by people.

- **Steppes** in Russia
- **Veld** in South Africa
- **Downs** in Australia
- **Savannas** in Central Africa (you have read about it in the chapter on the DRC).

In this chapter, we will study about the prairies, located in the centre of North America.

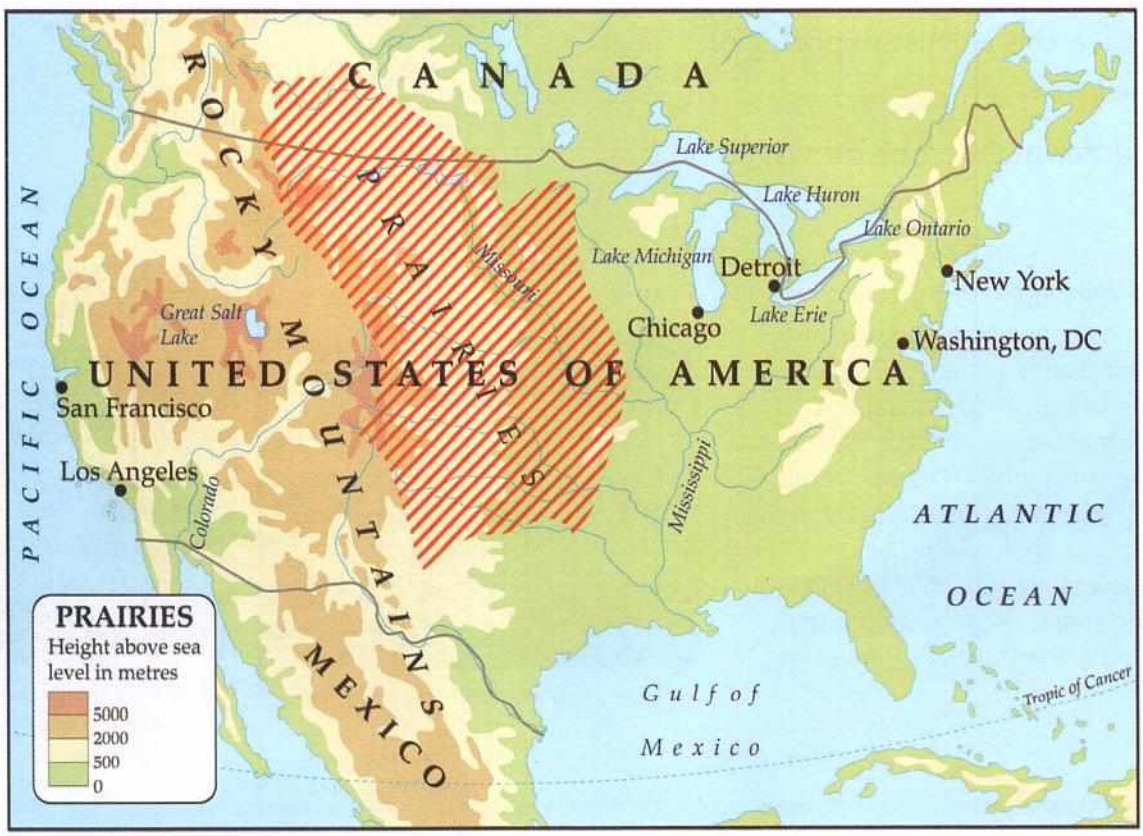
Vegetation and Climate

The prairies are a vast stretch of flat land covered by miles and miles of grass. The grass is green in summer and turns brown in autumn. There are hardly any trees. The soil of the prairies, like that of all grasslands, is very fertile. This is because of large quantities of **humus** present in the soil.

The prairies have hot summers and cold winters. Moderate rainfall occurs, mostly in summer. Earlier the prairies were the grazing grounds for millions of **bison**. However, today, most of the land has been cleared for agriculture by the people who came from Europe and settled here. Very few bison can now be seen. In fact, very little of the natural prairies remain today.

Did you know?

Prairie is a French word meaning meadow or grassland.



Bison grazing in the prairies

A wheat farm in the prairies

Agriculture

The soil here is fertile. Water is available in plenty from the Mississippi and Missouri rivers and their tributaries. This makes it perfect for agriculture. The region produces so much wheat that it is called the **wheat basket of the world**. It makes the United States of America the largest exporter of wheat in the world.

The other main crops grown are maize, barley, rye and oats.

Farm work such as ploughing, sowing, harvesting and threshing is done with the help of machines. The farmers, who are mostly European settlers, generally live on their huge farms with their families. The workers also live on the farms. Since the farms are huge, and machines do most of the work, the population in the region is thin.

Did you know?

There are two kinds of grasslands—tropical and temperate. Tropical grasslands, such as the pampas, have greater rainfall and the grasses are tall—some grow more than 2 metres high. They are mostly present in the Southern Hemisphere. Temperate grasslands get less rain and have shorter grasses. They are mostly found in the Northern Hemisphere.

The long grass of the pampas

A prairie dog stands in the short grass of the prairies

Rearing Cattle

Towards the west, the prairies are hilly and the soil is not so fertile. These areas are mainly used to rear cattle in large farms called **ranches**.

Cattle are raised for meat and dairy products. Dairy farming is an important industry, and and a wide range of products are produced, including milk, cheese, cream and butter. Most of the activities in the ranches, such as the milking of cows and the processing of milk, are done with the help of modern machinery.

Cattle grazing in a ranch

I now know

1. Most grasslands are located in the Temperate Zone.
2. The grasslands of North America are known as the prairies.
3. The prairies have hot summers and cold winters. Rainfall is moderate.
4. Most of the grasslands have been cleared for farming now. Wheat is the main crop.
5. Towards the west, the grasslands are used to rear cattle for meat and dairy products.

Words to remember

prairies: a vast stretch of flat land covered by tall grass and a few scattered trees
ranch: large farm where cows, horses or sheep are kept

Exercises

A. Fill in the blanks.

1. Most grasslands lie in the _____ Zone.
2. Prairies have _____ summers and _____ winters.
3. The _____ and _____ rivers flow through the prairies.
4. The main crop grown in the prairies is _____ .
5. Large farms in the western part of the prairies, used to rear cattle, are known as _____ .

B. Match the columns.

1. Steppes	a. North America
2. Veld	b. South America
3. Downs	c. Russia
4. Prairies	d. Australia
5. Pampas	e. Central Africa
6. Savannas	f. South Africa

C. Answer the following questions.

1. Where are most grasslands of the world situated?
2. What are the prairies?
3. Describe the climate of the prairies.
4. There were millions of bison a few hundred years ago in the prairies. But we cannot see any now. Why?
5. Why are the prairies so attractive for farming?
6. What is the main occupation of the people in the western part of the prairies?
7. What is a ranch? What are the main products of a ranch in the prairies?
8. The prairies have a small population. Why?

Multiple choice questions

1. Most of the grasslands of the world lie
   a. between latitude 23½° N and 23½° S
   b. north of latitude 66½° N and south of latitude 66½° S
   c. between latitude 23½° N and 66½° N, and between latitude 23½° S and 66½° S
   d. Near the poles
2. The grasslands in North America are known as the
   a. prairies b. pampas c. savannas d. downs
3. The natural vegetation in the prairies consists of:
   a. dense forest of tall trees with grass growing below
   b. plenty of grass and a number of tall trees
   c. plenty of grass and very few trees
   d. wheat crop
4. In which part of the prairies are most of the ranches present?
   a. north b. south c. west d. east

HOTS: Think and Answer

- The park near your house has a large lawn with grass growing in it. Can it be called a grassland? Why? (Hint: Has the lawn grown naturally?)

Enrichment Activities

- **Model work:** Create a model of a ranch. Before making it, study pictures of a ranch carefully. You can use clay and real grass to make the farm. Make the cattle with clay.
- **Write right/Speak out:** Find out how the bison was hunted to near extinction by the Europeans who came to settle in America. Write a report on your findings. You could also speak about it in class.
- **Art work:** The Native Americans are people who lived in North America before the coming of the European settlers. Collect pictures of Native Americans and interesting bits of information about their society. Create a piece of art in the traditional style of one of the Native American communities.

Hands on!

Have you heard of cowboys? The workers on a ranch who look after cattle are known as cowboys or cowhands. Many of them still ride on horseback, as in the 'Western' movies! They are excellent horse riders. The cowboy's chief tool is the lasso, which is used to catch cattle and horses.

Find out more about cowhands and their history.
Collect pictures and prepare a project on them.

Life Skills and Values

Being aware

Insects are found in all kinds of habitats. Some of them are dangerous. Here are some insects you should avoid.

1. Avoid any insect with pincers or a sting.
2. Stay away from bees and wasps. Their sting is dangerous.
3. Avoid centipedes — they are poisonous. However millipedes are not dangerous.
4. Avoid caterpillars with spines or hairs. The spines often contain a poison which will make you itch all over.
5. Avoid ants that are red in colour. Their bite can be quite painful. The small black ants rarely bite.

Weblinks

http://www.marietta.edu/~biol/biomes/grass.htm
http://environment.nationalgeographic.com/environment/habitats/grassland-profile/

9 Transport

Mind opener

Could cities have grown the way they have if there were no means of transport? (Hint: Most of today's cities are huge. How would people go to work without transport?)

Looking Ahead

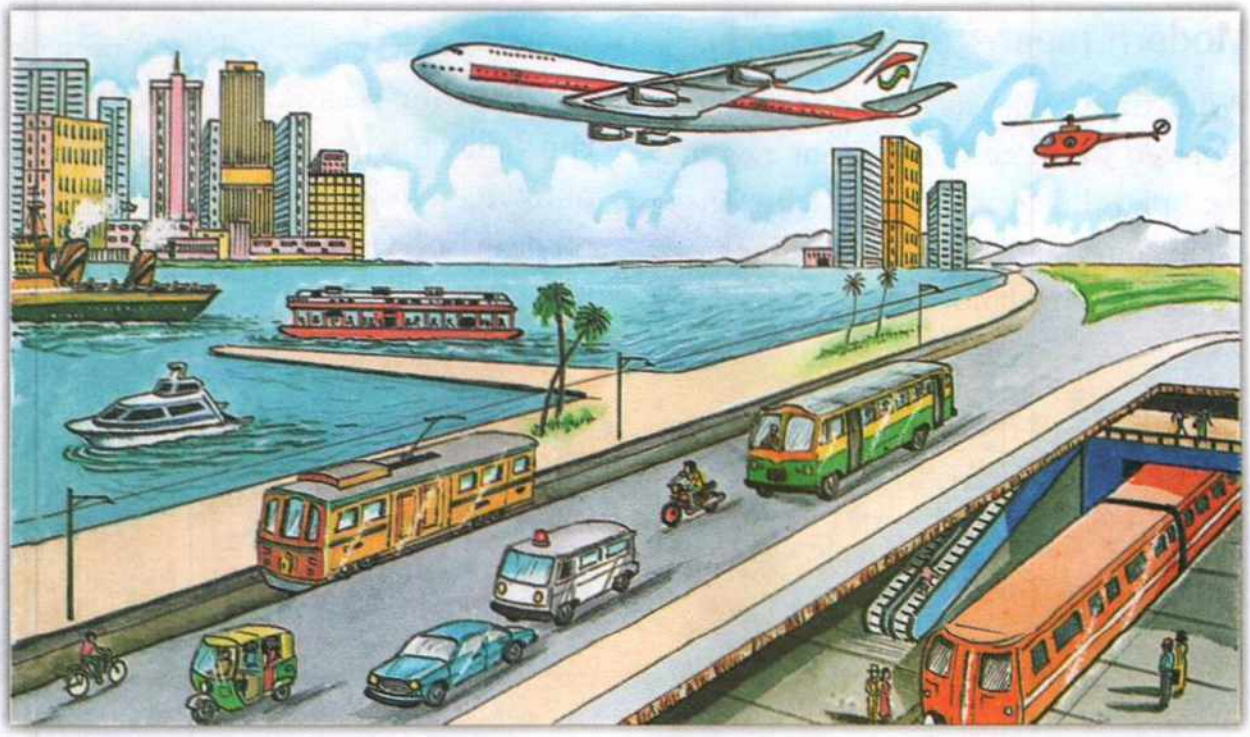
In this lesson you will learn about:

- *The invention of the wheel*
- *The different modes of transport*
- *The problems faced due to increasing traffic*

We use different means of transport to move from one place to another. We take a bus, car or train if we have to travel. We transport goods, supplies, etc., by trucks, lorries or ships.

The invention of the wheel

Long long ago, the early people could travel only on foot. They had to carry loads themselves. Then, they started using animals to transport themselves and their



goods. The invention of the **wheel** revolutionised transport. People started moving and carrying loads on carts fitted with wheels. These were pulled by people or animals.

Invention of the steam engine

The second revolution came with the invention of the steam engine. Thomas Newcomen made the first practical **steam engine** about 300 years ago. But it was the steam engine designed by **James Watt** in England about 240 years ago that made them popular.

The first train pulled by a steam engine was built about 200 years ago. At about the same time, ships using steam engines were made. It now became possible to transport heavier loads much faster.

Modern means of transport

With time, the steam engines were replaced by more efficient engines that used petrol, diesel and electricity. These engines are now used to run various types of vehicles on land, sea and air. They travel much faster and can carry much more load than the earlier vehicles.

Did you know?

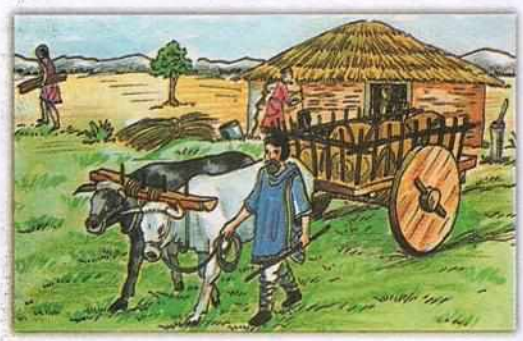
One of the oldest highways in India is the Grand Trunk Road, which runs from Kolkata to New Delhi. It was built more than 400 years ago by the Emperor Sher Shah Suri to connect Sonargaon in present-day Bangladesh to Multan in present-day Pakistan.

Roadways

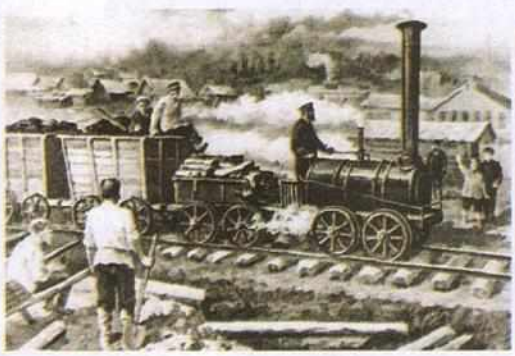
Land transport includes **roadways** and **railways**. Earlier, people travelled along narrow paths formed by the movement of people and animals. After the wheel was invented and carts became popular, people felt the need for hard and smooth roads. As vehicles became faster, it became necessary to have harder, smoother and better roads.

Today, every country has a network of paved (or pucca) roads, connecting cities and towns, and within each city or town. In India, unpaved (or kuchcha) roads are now seen only in villages.

In industrially developed countries,



Animals used to pull carts fitted with wheels



An early steam engine

James Watt

The National Highway connecting Delhi and Mumbai

there is a network of **highways** (also called **freeways** or **expressways**) connecting major cities. These are broad paved roads with two sections—for vehicles moving in opposite directions. Each side has several lanes for vehicles moving at different speeds.

These highways do not have sharp bends, crossroads or roundabouts, and they bypass towns they cross on the way. Thus, vehicles can travel very fast for long distances without stopping. This increases the speed with which people and goods are transported.

In India, such highways have been constructed between important cities. They are called **National Highways**. Most of the highways are of high quality, and consist of four or even six lanes on each side.

India is also connected by roads to its neighbouring countries such as Nepal, China, Bangladesh, Pakistan, Afghanistan, Myanmar and Bhutan.

Did you know?

India is rapidly developing the national highway network. The Golden Quadrilateral consists of highways that join the four metros—Delhi, Mumbai, Chennai and Kolkata.

Railways

In most countries, trains are the most important means of transport for people and goods. They can efficiently move a large number of people over long distances. They are also very useful for moving bulky goods from one place to another.

In India, the first railway train ran between Bombay (now Mumbai) and Thane, about 150 years ago. Today, India has one of the largest railway networks in Asia, and the fourth largest in the world. The Vande Bharat (with a peak speed of up to 180 km/h), the Gatimaan Express (with a peak speed of 160 km/h), and the Shatabdi and Rajdhani trains are the fastest trains in India.

The Delhi-Chandigarh Shatabdi

The railway networks in China, Japan, Italy, Spain, France, Germany and the USA are very well developed, and the trains are faster than in India. Most of their fastest trains run at over 300 kilometres an hour. Trains running between England and France go through the Channel Tunnel. The tunnel is 40 metres below the seabed under the waters of the English Channel.

The Eurostar, coming out of the Channel Tunnel.

Waterways

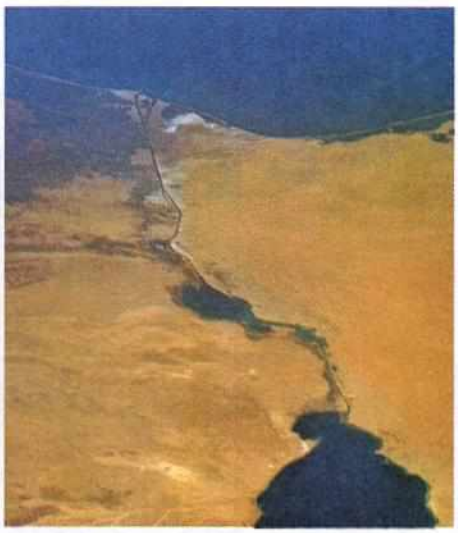
The early people made rafts to carry goods. The rafts were soon replaced with boats. Then came sailboats, which used the power of the wind to move. With the invention of the steam engine, water transport also underwent a revolution. About 200 years ago, ships driven by steam engines started replacing sailboats. Ships became larger and faster. Today, most ships are driven by diesel engines.

A fishing sailboat

Most bulky goods, such as foodgrains, mineral ores and petroleum, are transported around the world by ships. Though ships are not very fast, a single ship can carry as much cargo as thousands of trucks or aircrafts. Today, most ships that carry goods are designed to carry only one type of goods—for example, foodgrains or petroleum.

Transport by ships is also much cheaper than road or air transport.

An oil tanker



Satellite image of the Suez Canal

To make sea travel easier and faster, canals linking seas have been dug. They cut down the travel distance by almost half. The **Suez Canal** links the Mediterranean Sea with the Red Sea. Ships from India travelling to Europe now go through this canal. They no longer have to go around Africa to reach Europe.

The **Panama Canal** links the Pacific Ocean with the Atlantic Ocean. Ships going from Europe to Australia now go through the canal. Earlier they had to go around South America.

India is surrounded by seas on three sides. Its long coastline has a number of ports such as Mumbai, Chennai, Kolkata, Visakhapatnam, Cochin and Marmagao. A major portion of goods exported from India and imported into India are transported by ships. Within India, several rivers such as the Brahmaputra and the Ganga are used as waterways.

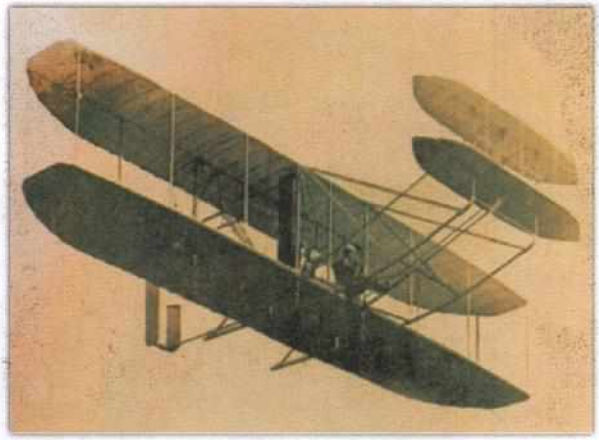
Airways

The fastest, though the most expensive, means of transport is by air. Aeroplanes can fly over any kind of land or water—deserts, mountains or vast oceans. Modern aeroplanes can carry a few hundred passengers and travel at about 800 kilometres an hour.

Goods, especially perishable items like fruits and vegetables, are transported within and outside the country by aeroplanes.

The first aeroplane was built by the **Wright brothers** more than a hundred years ago, in 1903. It was called Flyer I and its first flight lasted about 12 seconds, for a distance of less than 40 metres!

Today, all the important cities of the world are linked by air. Millions of

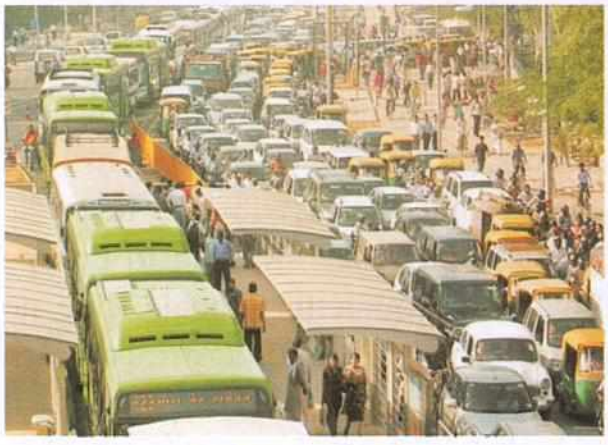


Flyer I, the first aeroplane built by the Wright brothers

people fly every day to destinations within and outside their countries. The airways network within India links more than 100 cities. Airfares have come down substantially so that more people are flying now than ever before. Air India is the national carrier of India. It operates on local and international routes, and connects India to all the important countries of the world. It also connects different parts of India with each other.

Problems of increasing traffic

Most large cities in the world have bad traffic problems. There is considerable congestion on the roads due to the large number of vehicles. This causes air pollution and accidents. People also waste more time travelling. One way of reducing the congestion is to improve public transport, such as public buses and the metro rail. If public transport is fast and efficient, fewer people will use their own vehicles.



A traffic jam in Delhi

The metro rail, a system of rail transport that connects parts of a city, is one way to reduce congestion on the roads.

Did you know?

The Airbus 380 is the world's largest passenger aircraft. It can carry more than 800 people. Its first commercial flight was on 25 Oct 2007 from Singapore to Sydney. It has a length of 73 metres, a wing span of 80 metres and a height of about 25 metres (roughly the height of an 8-storey building)!

The Airbus A380

A CNG bus and a CNG autorickshaw in Delhi — CNG helps reduce pollution

But it is very expensive to build. In India, Kolkata was the first city to have a metro rail. Other cities in India that have the metro rail are Delhi, Mumbai, Bengaluru, Chennai and Hyderabad, among others.

Efforts are being made to reduce pollution caused by vehicles by using more efficient engines and fuels. CNG is a fuel which produces very little pollution.

It has been introduced in Delhi for buses and three-wheelers.

I now know

1. Transport was revolutionised first by the invention of the wheel and then by the steam engine.
2. Land transport includes roadways and railways.
3. Paved roads and highways have made road transport faster and more efficient.
4. Trains can carry a large number of people over long distances and transport bulky goods.
5. Waterways are cheaper than other modes of transport.
6. Ships can carry huge amounts of bulky goods over large distances.
7. Air transport is the fastest and the most expensive mode of transport.
8. Increase in vehicles in cities has caused congestion on the roads, leading to pollution and accidents.

Words to remember

engine: a machine that burns fuel to produce movement
highway: a wide road between towns and cities built for fast travel
congestion: overcrowding
canal: an artificial waterway
metro rail: a railway system in a city that is built either underground or raised

Exercises

A. Fill in the blanks.

1. The invention of the _____ engine made it possible to replace carts driven by animals.
2. Roads connecting major cities are called _____ .
3. The first train in India ran from _____ to _____ .
4. If you were travelling by ship from India to France, your ship would pass through the _____ Canal.
5. The _____ brothers were the first to fly an aeroplane.
6. A railway system for travel within a city is called _____ .

B. Write T for true and F for false sentences.

1. Steam engines were only used for land transport.
2. The trains running between England and France travel through a tunnel under the seabed.
3. Almost all goods exported from India are sent on ships.
4. Perishable goods are best transported by air.
5. The Panama Canal links the Pacific Ocean with the Indian Ocean.
6. The steam engine was invented by James Watt.
7. Most trains and ships today use steam engines.
8. Improving public transport can reduce congestion on the roads.

C. Answer the following questions.

1. Why were better roads needed after the invention of the steam engine?
2. What are the advantages of a modern highway?
3. Name three major ports of India.
4. Trace the history of water transport.
5. What are the advantages of transporting goods by water transport?
6. How did the construction of the Suez Canal affect sea travel from India to Europe?
7. Who was the first to fly an aeroplane? Describe the first flight.
8. What are the advantages and disadvantages of air travel?
9. What problems has improvement of road transport caused?

Weblinks

Go to http://www.mapsofindia.com/distance/ and click on 'Get routes between two cities' to find how to travel from one city in India to another.

Go to http://event.airbus.com/a380/first_flight/seeing/indexMiniSite.html - and see the video of the first flight of the Airbus A380

Multiple choice questions

1. People started using carts driven by animals after the invention of the
   a. wheel b. engine c. steam engine d. electric engine
2. Which of these have engines?
   a. buses b. airplanes c. ships d. all of these
3. Which of these is the cheapest method of transporting goods over long distances?
   a. airplane b. truck c. ship d. train
4. While coming from Europe to India by sea, ships travel through which canal(s) to reduce travel distance?
   a. Panama canal b. Suez Canal
   c. both Panama and Suez Canals d. none of them
5. The advantage of the metro rail is:
   a. reducing traffic on roads b. reducing air pollution
   c. reducing travel time d. all of these

HOTS: Think and Answer

- In your opinion what created a bigger revolution in transport—the invention of the wheel or the steam engine?
- You are an exporter of flowers. You grow your flowers in India and sell them in Germany. What mode of transport will you use to transport your flowers to Germany? Give reasons.
- What problems can occur if a highway has sharp bends?

Enrichment Activities

- **Speak out/ Write right:** What would our lives have been like without wheels? Make up a humorous story about 'A world without wheels'. Write it down and share it with your class.
- **Model work:** Make a model of any of the different means of transport—train, bus, aeroplane or ship. You can use clay, thermocole, cardboard or modelling clay.
- **Find out:** Find out the record for the fastest speed achieved by a train. Also find out which regular train between two cities travels at the fastest speed.
- **Discuss and debate:** Have a debate in class on the topic, 'The world was better off without vehicles.'
- **Art work:** Prepare a chart on means of transport.

- **Project work:** Before aeroplanes were invented, people used to fly using hot air balloons. Find out more about hot air balloons, their history and uses. Prepare a report, or a website, with the information collected.

Hands on!

To make an aeroplane out of paper

Step 1: Fold a sheet of paper in half, lengthwise. Unfold so that the crease is 'valley' side up.

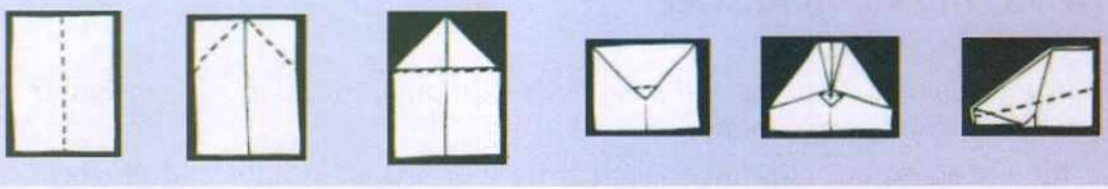
Steps 2 and 3. Fold the top corners down to the centre fold. Fold the tip.

Step 4. Fold about one inch of the tip up; unfold.

Step 5. Fold the top corners down to the centre fold so that the corners meet above the fold in the tip.

Step 6. Fold the tip up. This will lock the wings in place. Fold the wings inward in half. Now fold the wings outward so that the tip is on the outside. Now fold the wings down and fly!

Step 1 Step 2 Step 3 Step 4 Step 5 Step 6



Life Skills and Values

Booking a train ticket online

Have you ever gone to the Railway Reservation Office with your parents to book a train ticket? We often have to stand in long queues for hours before we get our tickets. These days we can book our tickets from the comforts of our home. Try this the next time you need to travel by train. You have to do this along with an adult who has a credit card.

- To reserve your train tickets online, go to www.irctc.co.in. First register your user name and password. Note them down for future use.
- Next log in with your user name and password.
- In the 'Plan my Travel' page that appears, enter your travel details and whether you want the ticket by post (i-ticket) or by a printout (e-ticket) and then select 'Find Trains'.
- Select the train you want to travel by and then click on 'Book Ticket'.
- Fill in details of the persons travelling.
- On the next page, click on 'Make Payment' and enter the required details.
- If you booked an i-ticket you have to give your address and it will be delivered to your house. If you booked an e-ticket, you can now print out your ticket.

10 Communication

Mind opener

How do you think the early humans exchanged ideas before the development of language and speech? Try and communicate without speaking for a day. Did you find it difficult? Share your experience with your classmates.

Looking Ahead

In this lesson you will learn about:

- *The different forms of communication*
- *Mass communication and its uses*
- *Technologies used for mass communication*

Communication is the exchange of information or ideas between people. We communicate when we talk to our friends, either face-to-face or over the telephone. We communicate when we write a letter, or send an e-mail. News, advertisements and other programmes on the radio or television are also forms of communication.

All living things communicate with each other. For example, a dog warns another dog not to come close by growling and snarling. Early humans used to communicate using signs, just like other animals. But because of their superior intelligence, they were able to develop **language** and then **writing** to communicate. This has enabled us to communicate better with each other.

Earlier, messages were sent over long distances through pigeons or horses. Later, the **postal services** made the task of sending messages much easier. Long distance communication was revolutionised by the invention of the **telephone** in 1876. Telephone lines are also used to send written messages through fax and e-mail.

A message in a metal case being tied to the leg of a carrier pigeon

Communication in animals

Early written communication was in the form of pictures. Shown here are ancient texts written in pictograph from China's Yunnan Province.

Communicating with Individuals

We often want to communicate with our friends or relatives. Let us see how many different methods of communication we can use.

Letters: We can send a **letter** through the post office or courier service.

Telephones: We can talk to any person over a telephone. The telephone is the fastest and most convenient means of sending spoken messages. It was invented in 1876 by **Alexander Graham Bell**. We can talk to anyone in another city in India using the **STD** (Subscriber Trunk Dialling) facility, and to anyone in another country using the **ISD** (International Subscriber Dialling) facility. **Mobile telephones**, or **cell phones**, can be carried along wherever we go. We can send short messages though our mobile phones using the Short Messaging Service (SMS).

Fax: We can send a copy of a document containing written matter, printed matter or pictures through a **fax machine** connected to a telephone line. The copy of the document reaches the receiver instantly.

E-mail: We can send a message through **electronic mail** or **e-mail**, using a computer with an Internet connection. The message reaches the receiver anywhere in the world, in a short time.

Smartphones: Smartphones can be used to make phone calls, share music files and photographs, and to receive and send e-mails.

Video calls: Video calls allow people to see each other while talking. Services such as Skype that allow us to video chat for free, have become popular these days.

Alexander Graham Bell talking on the first telephone line between two cities—Chicago and New York—on 18 October 1892

Mass Communication

When an idea is communicated to many people at the same time it is known as **mass communication**. For example, books, magazines and newspapers communicate an idea to several people at the same time. They are means of mass communication. Today, we know

a lot about what is happening around the world. The invention of the radio, cinema and television, revolutionised mass communication. More recently, the **Internet** has become a powerful means of mass communication. Let us learn more about some means of mass communication.

Printing: Since printing was invented by **Johann Gutenberg** in Germany in 1443, the printed word has been a powerful means of mass communication. The first printed newspapers appeared about 400 years ago, in 1609, in Germany. Newspapers and magazines give us news and information from all over the world. Billions of books, which give us information on all subjects, are available today.

Radio: It was an Indian scientist, **Jagdish Chandra Bose**, who first showed that radio signals could be sent over long distances without wires. The Italian scientist **Gugliemo Marconi** improved his work and is recognised as the inventor of the radio. Today, the radio is the cheapest method of mass communication. Several radio stations broadcast news, educational programmes and entertainment programmes from all over the world.

Cinema: The first film was shown on a screen about 115 years ago, in the year 1895. Talking films came about 25 years later. Today, cinema is an important means of entertainment. Documentary films are used for education and giving information.

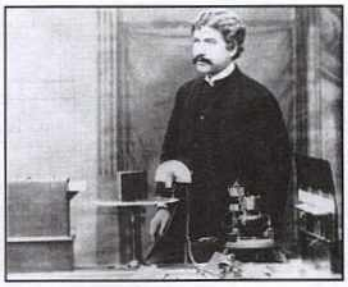
Did you know?

The earliest films were silent movies. **Raja Harishchandra**, made in 1913, was the first silent movie made in India. Movies with sound were called talkies. The first Indian talkie was **Alam Ara** (1931).

Television: The television was invented in England by **John Logie Baird** in 1926, only about 100 years ago. Within this period, it has become one of the most popular means of mass communication. It has the great advantage of having both sight and sound.

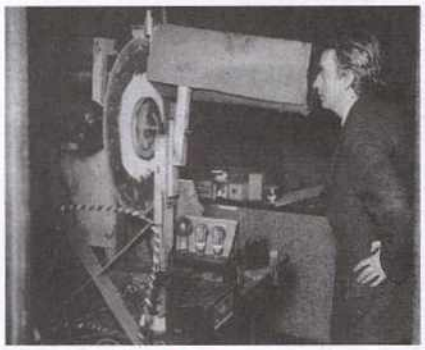
It allows people to see the pictures

Johann Gutenberg taking the first proof from his printing press



Jagdish Chandra Bose

Gugliemo Marconi



Baird and his first television camera

An early television set from the 1960's

Sending and receiving information through the Internet

and hear people talk, while sitting comfortably in their homes. Several television channels broadcast news, educational and entertainment programmes. Important sports and cultural events are shown live on television.

The Internet: Want information on any subject? Simply search the net! You will have so much information that it will become difficult to select what you need! The Internet is a fast and efficient way of sending information around the world. That is why it is sometimes called the **Information Superhighway**.

Social networking: Social networking is a new method of communicating over the Internet. You can communicate with a group of friends on the Internet using the services of a social networking site such as www.facebook.com. Any message you give on the site gets shared between all members of the group. You can keep your group limited to just close friends, or you can add hundreds of friends. The choice is yours.

Anyone over the age of 18 can join these sites.

Chatting on a social networking site

Did you know?

A computer can be connected to the Internet through a telephone line or a cable, and also without wires. Wireless Internet connection makes it possible to connect a laptop computer or a cellphone to the Internet, while the user is moving around.

Satellite Communication

Since the Earth is round, sending radio and television signals around the world was a problem. Communication satellites solved this problem. These

satellites are sent into outer space by rockets. They revolve around the Earth. Signals are sent up to the satellites which transmit them back to Earth, covering a much larger area in the process.

It is because of these satellites that you can see events such as cricket matches being played in England or West Indies live on your television. Telephone and computer signals are also sent to other countries through satellites.

A communication satellite orbiting the Earth

I now know

1. People are able to communicate well because of the development of language.
2. Telephone is the fastest and most convenient means of sending spoken messages. Mobile phones can be carried wherever we go.
3. Copies of documents can be sent instantly through a fax machine connected to a telephone line.
4. E-mails can be sent through a computer with an Internet connection.
5. The printed word in the form of books, newspapers and magazines is an important means of mass communication.
6. The radio is the cheapest means of mass communication.
7. Television is the most popular means of mass communication.
8. The Internet is a fast and efficient way of sending information around the world.
9. Communication satellites have made it possible to send television, telephone and computer signals efficiently around the world.

Words to remember

communication: exchange of information between people

fax: a system of sending documents and pictures over telephone lines

Internet: a huge network of computers all over the world

Exercises

A. Identify the means of communication from the following clues.

1. Copies of documents sent through this machine reach instantly: _____
2. The most popular method of sending spoken messages: _____
3. The cheapest means of mass communication: _____
4. The most popular means of mass communication: _____
5. Information Superhighway: _____
6. Documentary films: _____

B. Write T for true and F for false sentences.

1. Mass communication became possible after printing was invented.
2. E-mail is delivered to the receiver as fast as a copy of a document sent through a fax machine.
3. The most popular means of mass communication is the television.
4. Television signals are sent to far away places through satellites.
5. The Internet cannot be used for mass communication.

C. Answer the following questions.

1. How did early humans communicate with each other?
2. What made it possible for humans to become better communicators than animals?
3. What is mass communication?
4. List three means by which you can send a written message to another person.
5. Name four means of mass communication.
6. Why is television one of the most popular means of mass communication?
7. Why is the Internet called the 'Information Superhighway'?
8. How did satellites improve communication?

HOTS: Think and Answer

- Why do you think radio and television are more popular means of mass communication in our country than the printed word?
- Landline telephones are not used as much today as they were 20 years back. Why?
- In what way is communicating on social networking sites different from sending an e-mail to a friend?

Weblinks

http://transition.fcc.gov/cgb/kidszone/history.html - visit this site for history of radio, television, cell phones, Internet.....

Multiple choice questions

1. Which of these is a method of mass communication?
   a. letter b. telephone c. radio d. e-mail
2. Which of these is known as the Information Superhighway?
   a. television b. internet c. radio d. all of these
3. Who invented printing?
   a. Johann Gutenberg b. Gugliemo Marconi c. John Logie Baird
   d. Alexander Graham Bell
4. Which of these is used both for individual communication as well as for mass communication?
   a. radio b. television c. internet d. all of these

Enrichment Activities

- **Puzzle time:** Find the inventors in the word grid.
  1. Printing
  2. Telephone
  3. Radio
  4. Television
  5. Morse code

D	V	W	B	T	W	X	M	N
G	U	T	E	N	B	E	R	G
P	Q	M	L	V	A	K	U	L
N	A	L	L	P	I	R	M	N
A	P	R	M	O	R	S	E	O
N	H	G	B	H	D	I	M	P
M	A	R	C	O	N	I	R	S

- **Speak out:** Have a debate in class on the topic: 'Children should be allowed to bring mobile phones to school'.
- **Write right:** Write a letter to your grandparents in an inland letter paper. Show it to your teacher. Then stick it and write their address on the cover carefully. Drop it into a letterbox.
- **Art work:** Prepare a poster or a collage on the different means of communication.
- **Project work:** The Internet developed recently. Find out about the history of the Internet, and prepare a project or a website on it.

Hands on!

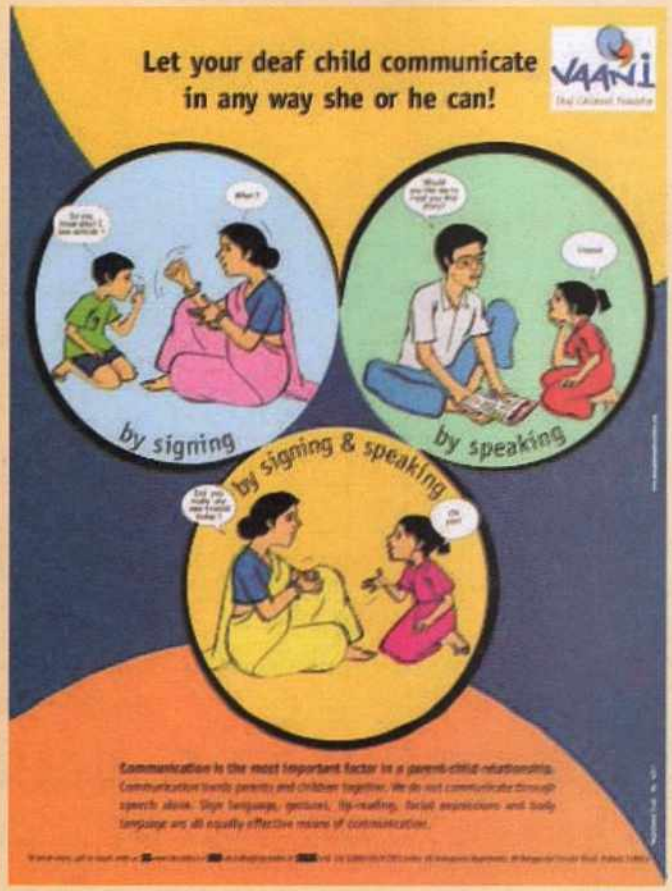
Make your own telephone

You will need: 2 empty matchboxes, string, 2 match sticks

- Take the inner tray out of the matchboxes.
- Make a small hole in the middle of each tray.
- Pass one end of the string through the hole in one of the matchboxes. Tie a matchstick to that end of the string.
- Do the same with the other end of the string and the other matchbox.
- Ask your friend to take one matchbox and walk away from you till the string is fully stretched.
- Hold one matchbox tray to your ear and ask your friend to talk into the other tray. Can you hear her or him clearly?

LifeSkills and Values

Being sensitive to people with disabilities



This poster gives the message that communication is important, whatever be the means.
Have you seen people who cannot speak or hear communicate with each other?

11 Recording and Communicating Knowledge

Mind opener

Suppose you have an idea. You can communicate it by either saying it to someone, or by writing it down. Think—which would be a more effective method of communication — oral or written? Why?

Looking Ahead

In this lesson you will learn about:

- *The importance of written communication*
- *The development of scripts and ways of writing numbers*
- *The making of paper and development of printing*
- *Braille—a script for the visually challenged*

We have seen in the last chapter that we send messages in two different ways—by speaking or by writing. Writing is a way of recording or storing words and ideas. People can read them at any time and at any place. Long ago, in ancient India for example, knowledge was passed on orally from generation to generation. It was not recorded in a written form. Because of this, knowledge was communicated to a very few people. This may also have resulted in the loss of knowledge. Slowly, better methods of recording and communicating knowledge came into place.

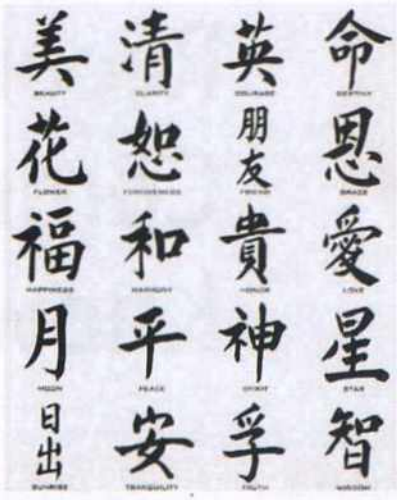
The earliest form of written communication was through pictures. These cave paintings from Bhimbetka in Madhya Pradesh are more than 10,000 years old.

Written Communication

The earliest form of written communication was through pictures. Pictures, mainly of animals, have been discovered in caves in which early humans lived. But making pictures took a long time. Gradually, the pictures were replaced by signs and symbols. The Sumerians of Mesopotamia (now Iraq) were the first to develop a system of writing, called a **script** using signs, over 5000 years ago. They wrote their signs on blocks of clay, called **tablets**. Many of these tablets have been discovered. The Egyptians developed a script using pictures and symbols about 5000 years ago. The Chinese and Japanese scripts are based on pictures and symbols even today.

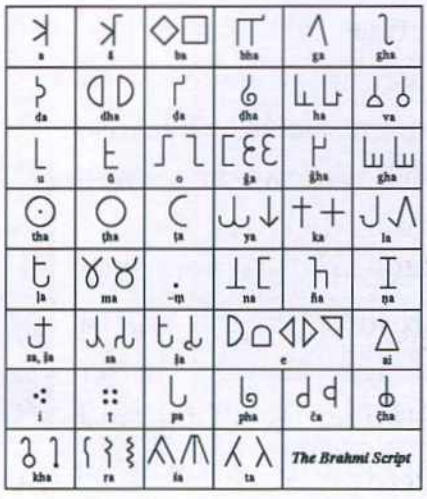
Most languages today use the system of the **alphabet**. Alphabets are nothing but symbols representing different sounds humans produce. The first

The Sumerian system of writing



The Chinese system of writing

The Indus script



The Brahmi script

proper alphabet system to be used was probably developed in Syria, about 3500 years ago. About 50 different alphabet systems are used in the world today. The **Roman alphabet**, which is used to write the English language, has 26 letters.

The oldest script in India is believed to be the one developed by the people of the Indus Valley Civilisation. Later, the Brahmi and other scripts were developed. Most scripts used to write Indian languages today have been derived from the **Brahmi script**. The **Devanagri script** is used to write Hindi and some other Indian languages.

Writing Numbers

In the early days, sticks and stones, and even pictures were used to count. Early humans used pictures and symbols to keep record of numbers, for example to record the number of animals they hunted.

The Romans developed a system of writing numbers in which seven symbols were used to write numbers from 1 to 1,000,000. The common system of writing numbers used in most parts of the world today is the **Hindu-Arabic system**. This system was developed in India more than 2000 years ago. The Arabs took it to Europe. The beauty of the system is that it uses only 10 symbols from 0 to 9, to represent any number, no matter how large it is.

Did you know?

The credit for the invention of the Zero (0) goes to ancient Indian Mathematicians. The invention of the zero, revolutionised the way people wrote numbers.

Paper

About 4000 years ago, the ancient Egyptians used the stem of a plant called papyrus to make paper. The name 'paper' is derived from **papyrus**. The kind of paper that we use today, however, was first made by the Chinese about 1900 years ago. It was probably made from the bark of trees. The bark was made into pulp and then spread out in thin sheets and left to dry. Today, wood pulp is used to make paper.

Brahmi		𑁒	𑁓	𑁔	𑁕	𑁖	𑁗	𑁘	𑁙
Arabic	٠	١	٢	٣	٤	٥	٦	٧	٨	٩
Medieval	0	1	2	3	4	5	6	7	8	9
Modern	0	1	2	3	4	5	6	7	8	9

Different number systems

Did you know?

The written word and pictures need not be stored on paper now. They can be stored on computer storage devices such as CDs, DVDs, pen drives and hard disks. These require far less storage space than paper.

Paper was invented before printing. Earlier, books had to be written by hand on paper. This was slow and laborious. Books were therefore very rare. They were only available to a few people.

Printing

Printing was developed in **China** about 2000 years ago. The Chinese cut designs on flat blocks of wood. Ink was applied on the block, and it was pressed on paper. Thus, an impression of the design was made on paper. This method was used by the Chinese to print books. Though the blocks took a long time to make, several copies of a book could be made from them.

In the year 1450, **Johann Gutenberg** of Germany brought about a revolution in printing. He made several small metal moulds of the letters of the alphabet. They were called **types**. They could be arranged to form words, lines and pages. This was called **typesetting**.

Ink was applied to the typeset pages and they were pressed on paper to get the impression. Once a book was printed, the individual types were taken apart, and used to print another book. Putting together the types to make a page of a book was much faster and easier than making a block of the page. Books could now be printed much faster and in larger numbers. They became cheaper, and many more people could read them.

Preparing the wood block

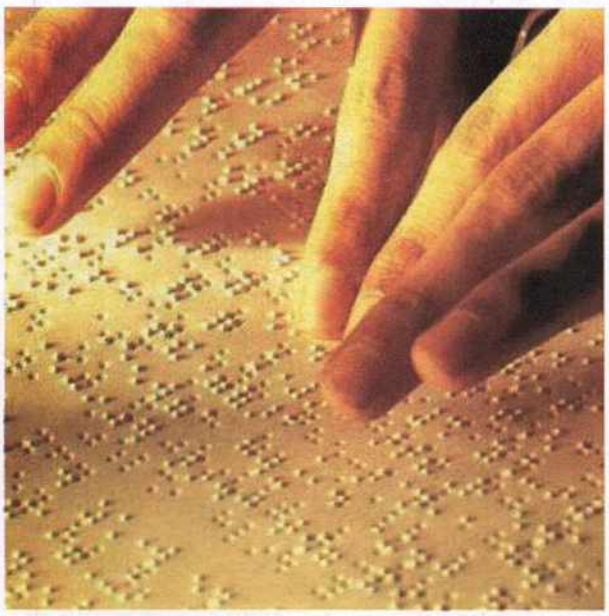
Printing with the block

The movable metal type developed by Gutenberg

Printing a newspaper

Braille—a Script for the Blind

We read with our eyes. But, how would a visually challenged person read? A special script called **Braille** allows a person who cannot see to read a book, using his or her fingers. The script was developed by **Louis Braille** in France. In Braille, the letters of each word are printed in patterns of small dots. These dots are raised from the surface of the paper, so that the visually challenged can feel them with the fingers. Braille is read by lightly running their fingers along these dots.



A person without sight reading using Braille

Knowledge, Literacy and Progress

With the coming of computers, printing has become much faster and better. Metal types are no longer used. Instead special computer software like PageMaker and InDesign are used to arrange the text and pictures in the pages.

If a country wants to make progress, it is important that knowledge be communicated to a large number of people. You know that this is possible only if most people in the country can read and write. Literacy is, therefore, the key to progress. Unfortunately in India, a large number of people still cannot read and write.

I now know

1. Recording knowledge in written form is important for communicating to a large number of people.
2. Written communication started with pictures. Then came signs and symbols.
3. Most languages today use the system of alphabets for writing.
4. The Hindu-Arabic system used to write numbers today, was developed in India.
5. Block printing was first used in China.
6. Johann Gutenberg brought about a revolution in printing by using reusable types.
7. The Braille script can be read by visually challenged people with their fingers.

Words to remember

script: a system of writing a language
typesetting: the process of arranging text for printing
braille: a system for writing a language for the people who cannot see
visually challenged: a person who cannot see

Exercises

A. Identify the country where the following were developed for the first time.

1. The Hindu-Arabic system of writing numbers: _____
2. A script for writing a language: _____
3. Paper from papyrus: _____
4. Block printing: _____
5. Reusable types for printing: _____
6. Braille script: _____

B. Answer the following questions.

1. What problems arise if knowledge is communicated only orally?
2. Where was the oldest script developed in India?
3. What is the advantage of the Hindu-Arabic system of writing numbers?
4. How did the Chinese make paper several hundred years ago?
5. How was printing done using wooden blocks?
6. What was the disadvantage of printing books using wooden blocks? How did it affect the spread of knowledge?
7. What was the advantage of Gutenberg's method of printing?
8. Describe the Braille script. How does a visually challenged person read it?
9. How are progress and literacy related?

Multiple choice questions

1. In ancient India knowledge was mostly passed on
   a. by writing on paper b. by drawing pictures c. by printing books d. orally
2. Hindi is written in the
   a. Brahmi script b. Devanagri script c. Braille script d. Sumerian script
3. Paper was invented in
   a. India b. China c. England d. Germany

4. Printing using types was invented in:
   a. India b. China c. England d. Germany
5. Which of these is the script used for printing books for the visually challenged?
   a. Brahmi script b. Devanagri script c. Braille script d. Sumerian script

Weblinks

http://www.translatum.gr/converter/braille.htm - convert any text to Braille
http://www.historyforkids.org/learn/literature/paper.htm - history of paper

HOTS: Think and Answer

- Do you think knowledge spread faster and to a larger number of people after Gutenberg's invention? Why?
- What is the advantage of communicating knowledge by writing?

Enrichment Activities

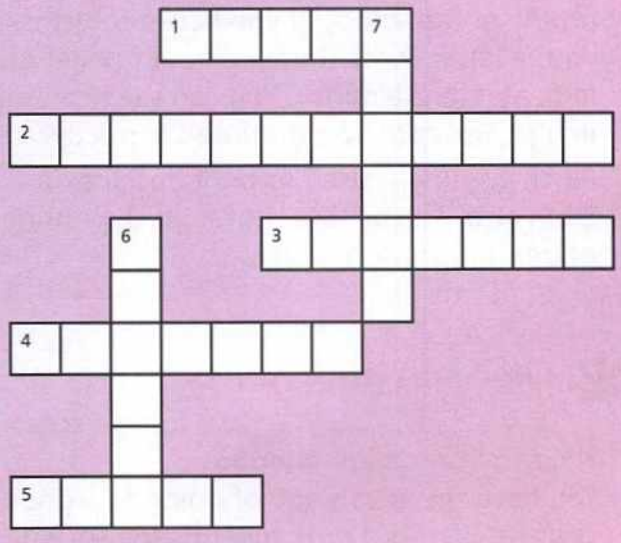
- **Puzzle time:** Solve the crossword using the given clues.

Across:

1. Reusable moulds of letters that can be arranged to form lines and pages for printing
2. This system of writing numbers is used all over the world today.
3. The plant used by the Egyptians to make paper
4. The visually challenged can read this script with their fingers
5. Printing was developed in this country more than 2000 years ago

Down:

6. The scripts for most Indian languages have been derived from this ancient script
7. The system of writing a language

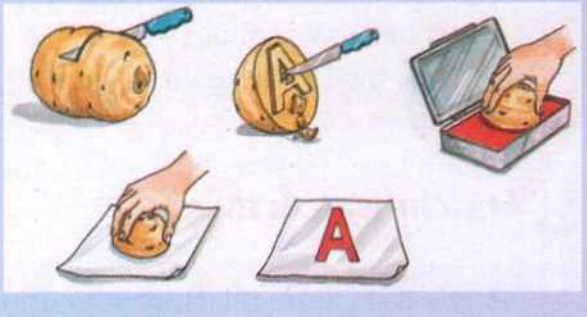


- **Write right/Speak out:** Some of the richest people in the world are barely literate. Why then do we say that a country where most people are illiterate cannot progress? Write an essay on, or speak about, on the importance of literacy for progress.
- **Find out:** Electronic devices have been recently developed on which you can read books. Tablet computers and the Kindle are some such devices. One device can store thousands of books. Find out about such devices.
- **Have a debate:** Do you think that in a few years' time printed books will become outdated and everyone will be reading e-books on devices like Kindle? Have a debate on this in class.
- **Art work:** Prepare a poster or collage to highlight the importance of literacy. Also develop a catchy slogan and write it on the poster.

Hands on!

Do your own block printing.

Take a big potato. Cut it in half. Using a pencil write the letter 'A' on one half, as shown. Take the help of an adult to scoop out the potato pulp from around the letter. The letter 'A' is now raised from its surface.



Press the potato on to an inking pad. Now press it against paper. Did the letter 'A' get printed on the paper?

Now try with the letter 'B'. What did you find? Was B printed correctly? To print any letter you have to make a mirror image of it on the potato block. If you have problems with a letter, write it on a piece of paper and look at it in the mirror. You can see its mirror image. How did 'A' get printed correctly?

Block printing is used to print designs on cloth also. The picture shows block printing of designs on cloth in Jaipur.

Life Skills and Values

Help to spread knowledge

You have the advantage of going to a good school. This will give you knowledge and skills for life. As a duty towards the society, you should help to spread this knowledge by teaching at least one illiterate person — 'each one, teach one'.

12 Living Longer and Healthier Lives

Mind opener

When was the last time you fell ill? Were you taken to a doctor? What instruments did the doctor use to examine you? Did he or she give you any medicine to take?

Looking Ahead

In this lesson you will learn about:

- *The clinical thermometer, the stethoscope and the microscope*
- *Machines that can look inside your body*
- *Surgery and anaesthesia, and antibiotics*
- *Vaccination, pasteurisation and antiseptics*

Today, people are living longer than ever before

To live a long and healthy life we need many different things. We need a clean environment and healthy, nutritious food. We also need good medical care.

A long time back, humans did not understand diseases, and thus did not know how to cure them. Diseases were considered to be a curse of God. But today, due to the tremendous progress made by medical science, we understand why diseases occur. Several methods of diagnosing diseases have been developed. Thousands of medicines are now available, and more are being developed to treat different diseases.

In this chapter, we will look at some major developments in the field of medical science.

The Clinical Thermometer

Often when we fall ill, our body becomes warmer. This is known as **fever**. Fever is a sign of a disease. When you complain that you are not feeling well, your parents touch your forehead to find out if it is warm or not. But this does not give a correct idea about

Mother checking her child for fever

A man testing his temperature with a clinical thermometer

the fever you have. So they measure the temperature of the body with the help of a **clinical thermometer**. Temperature is a measure of how hot or cold something is. It is measured in °C (degree Celsius) or °F (degree Fahrenheit). The clinical thermometer was invented by **Gabriel Daniel Fahrenheit**.

The Stethoscope

When you are ill, you go to a doctor. The doctor examines your chest and back with a **stethoscope**. The doctor is able to listen to the sound of your heart and your breathing through the instrument. It helps them to find out what you are suffering from. The stethoscope was invented by a French scientist called **Rene Laennec**.

Microscope

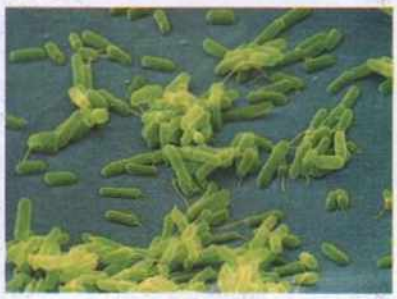
A microscope magnifies a tiny object and makes it look much larger. It helps us to see things which are too small to see with the naked eye. The first microscope was probably made by **Zacharias Janssen** in about 1590. He was a spectacle maker in Holland. Several scientists helped to improve the microscope.

The microscope contributed a lot to the development of medicine. With its help, scientists were able to see, for the first time, the **germs** that caused diseases. Over the years, they have been able to identify germs that cause different diseases. It then became possible to find medicines that could cure diseases by killing those germs.

Today, doctors examine the blood or urine of a patient under a microscope to see the germs. This helps them find

A doctor listening to a girl's heartbeat with a stethoscope

A scientist looking through a microscope



The E.coli bacteria seen under the microscope—this bacteria causes diarrhea

out the disease the patient is suffering from.

Machines that can look inside your body

Several new machines have been developed, which can look inside your body and produce pictures of it. **X-ray** machines can take pictures of the inside of a person's body. **Scanners** produce pictures which show more details than an X-ray photograph. The different types of scanners available are **ultrasound**, **CAT** and **MRI**. With the help of these machines, doctors can see images of bones and internal organs and find out the disease a patient is suffering from.

Surgery and Anaesthesia

Sometimes, to treat a defective organ in the body, it is necessary to cut open the body and operate on the organ. This is known as **surgery**. Through surgery, it is possible to repair the organ and cure the disease. In some cases, it is also possible to replace the organ with a healthy one.

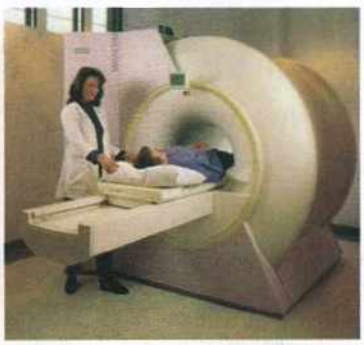
Ancient Indian texts mention surgery being practised in ancient India. Surgery was very painful earlier. Now doctors make the patients unconscious before operating, so that they do not feel the pain. Doctors give the patients **anaesthesia** to make them unconscious. **Chloroform** was one of the first drugs to be used as an anaesthetic. The first operation using chloroform as an anaesthetic was performed on 18 November 1847.

Antibiotics

Bacteria are germs which spread several diseases such as tuberculosis, cholera and typhoid. In 1928, **Alexander Fleming** discovered a drug called **penicillin** which could prevent the growth of bacteria. He used the drug to cure many types of bacterial infections. Later many other such drugs were discovered. They are called **antibiotics**.

The discovery of antibiotics was an important milestone in the development of medicine.

An X-ray photograph of the hands



A man undergoing an MRI scan

Surgeons conducting a surgery

Alexander Fleming

Edward Jenner vaccinating a child against smallpox

Did you know?

One of the most dreaded diseases today is AIDS, caused by a virus (a kind of germ) known as HIV. A lot of research is going on all over the world to find a vaccine against AIDS. But so far no effective vaccine has been found.

Vaccination

Medicines, such as antibiotics, cure diseases, but **vaccines** prevent diseases from occurring. If a person is vaccinated against a disease, her or his body develops the ability to fight the germs that cause the disease. Vaccines which act against several diseases such as tuberculosis, cholera and tetanus are available today.

The first vaccine to be discovered was against the dreaded disease **smallpox**. This disease was a major cause of death in the 18th century. An English doctor, **Edward Jenner**, observed that people who had a mild disease called cowpox did not suffer from smallpox. So, he injected cowpox germs into the body of a young boy in 1796. A few weeks later, he injected him with smallpox germs. The boy did not get smallpox. He successfully tried this method of preventing smallpox on other people. Edward Jenner had discovered a vaccine for smallpox.

Today, thanks to him, smallpox has been removed from the world. Since then, vaccines have been developed against many diseases such as polio, tuberculosis, hepatitis, cholera and tetanus.

Pasteurisation

Louis Pasteur, a Frenchman, studied the causes of diseases. He showed that many diseases are caused by tiny germs. These germs also carried diseases from one person to another. He discovered that heat kills germs. Milk or water can be boiled to kill germs and prevent diseases. The process of killing germs by boiling followed by rapid cooling, especially in milk, is called **pasteurisation**.

Louis Pasteur in his laboratory

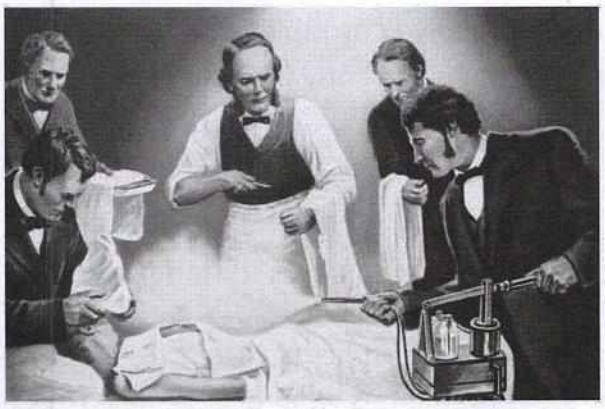
Milk being pasteurised

Antiseptics

Joseph Lister, a surgeon, lived about 150 years ago. At that time surgery was new and many patients died after operations due to infection of the wounds. Lister tried several methods of controlling the infection without success. Then, he studied Pasteur's findings about germs. He realised that germs caused the infections in the wounds and started looking for a method to kill the germs.

He tried a chemical called **carbolic acid**. He sprayed carbolic acid in the air, washed his hands, instruments and the patients' skin with it before performing an operation.

The deaths due to infections came down dramatically. Joseph Lister had discovered the first **antiseptic**—a chemical that kills germs.



Joseph Lister (in the centre) and the carbolic spray

Keeping Healthy

Germs cause several diseases. Many diseases are also caused if we do not eat a proper diet. We can remain healthy by following simple rules which take care of these two factors.

1. Eat good nutritious food, which gives the body all the nutrients it needs.
2. Keep yourself and your surroundings clean. This prevents the breeding and spreading of germs. Keep your body clean by having a bath with soap and water every day. Wash your hands with soap and water before and after eating.

   Garbage breeds germs, and insects spread germs. Therefore, always keep garbage covered. Dispose it from time to time, and do not allow it to accumulate.
3. Exercise regularly. Exercising strengthens the body and it becomes more capable of fighting diseases.
4. When you feel unwell, go to a doctor. The doctor will find out what disease you are suffering from using some of the methods you have read about in this chapter. She or he will give you the proper medicine to cure you.

Exercise regularly; it is good for your health.

I now know

1. The clinical thermometer, invented by Gabriel Daniel Fahrenheit, is used to measure the temperature of the body.
2. The stethoscope, discovered by Rene Laennec, is used by the doctor to listen to the heartbeat and breathing.
3. The invention of the microscope made it possible to see disease-causing germs.
4. X-ray machines and scanners take pictures of the inside of a person's body.
5. Anaesthesia made it possible to perform surgery without pain.
6. In 1928, Alexander Fleming discovered the first antibiotic called penicillin, which could prevent the growth of bacteria.
7. Vaccines prevent diseases from occurring. Edward Jenner discovered the first vaccine against smallpox.
8. Louis Pasteur discovered that many diseases were caused by germs. He discovered the method called pasteurisation to kill germs in milk.
9. Joseph Lister discovered that an antiseptic could prevent the spread of germs by killing them.
10. Eating nutritious food, keeping ourselves and our surroundings clean, and exercising regularly are simple rules to be followed to remain healthy.

Words to remember

germs: very tiny living things that cause diseases
surgery: a medical treatment that involves cutting open a part of the body; operation
infect: to make an illness or disease spread to others
pasteurisation: the process of killing germs by boiling followed by rapid cooling
vaccine: a substance that is put into the blood and protects the body from an illness
antiseptic: a chemical that kills germs

Exercises

A. Mohan is not well. What instrument or medicine should be used under the following situations?

1. Mohan's mother feels his body is warm and wants to see if he has fever: _____
2. The doctor wants to listen to Mohan's heartbeat to find out what disease he has: _____
3. After examining Mohan, the doctor is not certain what disease he is suffering from. She takes a sample of his blood and wants to examine it: _____
4. She suspects that there is a problem with one of the internal organs, and wants a picture of the organ taken: _____
5. The doctor thinks Mohan is suffering from a bacterial infection. What medicine will she give? _____

B. Answer the following questions.

1. What does a doctor use a stethoscope for?
2. What is a microscope? How does it help in finding out what disease a patient is suffering from?
3. What are scanners used for?
4. How does anaesthesia help in surgery?
5. Why is the discovery of antibiotics considered to be an important milestone in the development of medicine?
6. How is a vaccine different from a medicine?
7. How did Jenner discover the smallpox vaccine?
8. What was Louis Pasteur's important contribution to the field of medicine?
9. Why was surgery very unsafe 150 years ago? What development made it much more safe?
10. What simple rules should you follow to remain healthy?

Multiple choice questions

1. Which of these is used to measure the body temperature?
   a. clinical thermometer b. stethoscope c. microscope d. scanners
2. Which of these processes can be used to see organs inside the body?
   a. Ultrasound b. CAT scans c. MRI d. all of these
3. To make a patient undergoing surgery unconscious, doctors use
   a. antibiotics b. vaccines c. antiseptic d. anaesthetic
4. The first vaccine to be discovered was against the disease
   a. polio b. small pox c. cowpox d. tuberculosis
5. With which of these will a doctor clean surgical instruments?
   a. antibiotics b. vaccines c. antiseptic d. anaesthetic

Weblinks

http://www.knowitall.org/kidswork/hospital/history/ancient/index.html - history of medicine from ancient to modern

http://history1900s.about.com/od/medicaladvancesissues/a/penicillin.htm - the story of the discovery of penicillin

http://www.historylearningsite.co.uk/edward_jenner.htm - learn about Edward Jenner

HOTS: Think and Answer

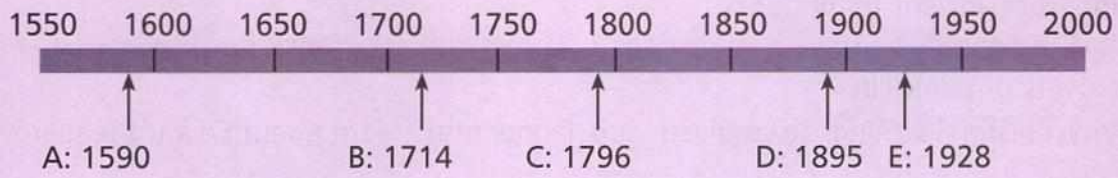
- Today doctors can cure many diseases. What effect do you think this has on the population of a country?

Enrichment Activities

- **Puzzle time:** In the word grid, find the names of the scientists who discovered the following.
  1. Penicillin
  2. Smallpox vaccine
  3. Pasteurisation
  4. Clinical thermometer
  5. Stethoscope
  6. The first antiseptic
  7. The first microscope

A	L	J	P	M	N	K	S	Q	P
V	I	Q	A	L	F	K	R	W	O
U	S	B	S	O	L	T	U	V	N
D	T	P	T	J	E	N	N	E	R
S	E	I	E	J	M	I	K	L	M
T	R	Y	U	Y	I	X	H	J	G
F	A	H	R	E	N	H	E	I	T
E	B	D	C	C	G	H	I	H	G
J	A	N	S	S	E	N	F	F	L
X	A	L	A	E	N	N	E	C	M

- **Speak out:** Do you know of anyone who was very ill and whose life was saved by a doctor? Share the story with your classmates.
- **Write right:** Which of the discoveries or inventions mentioned in this chapter do you think was the most important for the human race? Write about the discovery and explain why you feel it was the most important one.
- **Find out:** Doctors have to take the Hippocrates Oath when they complete their medical education. What is this oath? Do you think all the doctors abide by the oath?
- **Project work:** Find out, collect pictures and make a project file or website on 4-5 people who made important discoveries in the field of medicine.
- The marks A, B, ... in the timeline below show the major landmarks in the field of medicine in the last 450 years. Find out what these landmarks are. You will find some of them in the chapter. But you will have to find out some of the others for yourself. (Hint: You can look up the Internet).



Hands on!

Measure your body temperature

You can measure your body temperature with the help of a clinical thermometer. It could be either a mercury thermometer or a digital thermometer.

If you have a mercury thermometer:

- Wash the end which is put in the mouth.
- Jerk the thermometer 2-3 times to bring the reading down.
- Put it in your mouth under the tongue.
- Take the thermometer out after 1 minute and see the reading — it gives your body temperature.
- Jerk the thermometer to bring the reading down.

If you have a digital thermometer, you do not have to jerk it. The other steps are the same as above.

Life Skills and Values

First aid in case of high fever

Fever occurs in the body because of some disease. Fever of more than 104°F (40°C) can be very dangerous. If high fever persists, it can cause dehydration and brain damage, and even death. If someone has high fever he/she must be shown to a doctor. However, some steps taken before the doctor arrives can save the patient's life.

- Make the person lie down and take rest.
- Remove excess clothing — the patient should wear loose comfortable clothing.
- Do not wrap the patient in a blanket
- Give plenty of water and other fluids.
- Put an ice pack or a cloth dipped in cold water on the forehead. This temporarily brings down the fever.

13 The Age of Machines

Mind opener

Make a list of all the machines you or your parents use in a day – for example refrigerator, washing machine, bicycle, car, mixie, etc. Now try to imagine your life without these machines.

Looking Ahead

In this lesson you will learn about:

- *The discovery of metals*
- *The industrial revolution*
- *The different sources of energy and its alternates*

Early Stone Tools

The age in which we live can be called the '**age of machines**'. A machine is a tool that makes our work easier, like a bottle opener or a hand-cart. We use machines all the time. It is difficult to imagine life without these machines.

But almost a million years ago, early humans lived without any machines. Using their intelligence, they first made simple stone tools to hunt. The progress to better tools made of metals was very slow and took thousands of years. But recently, humans have made rapid progress. Most of the machines that we use today were invented over the last 300 years or so.

Machines in our lives

Discovery of Metals

Copper, the first metal to be discovered, was used over 8000 years ago in parts of Asia. It was used to make better tools. The next metal to be discovered was **bronze**.

It was made by mixing copper and tin, and was harder than copper. It was discovered at different times in different parts of the world. The earliest bronze articles found are about 6000 years old.

Early stone tools

Early bronze weapons

The next metal to be discovered was **iron**. This was an important discovery, as iron was harder than copper and bronze. It was used to make much better tools and weapons. Iron tools were used to cut down trees and clear forests for agriculture. Thus, agriculture improved. Iron weapons also made it easier to hunt animals. So, the discovery of iron helped humans progress faster.

Wheels, Carts and Boats

We do not know when the wheel was discovered but carts using wheels were being used over 5000 years ago. The early carts were pulled by humans. But afterwards, they started using animals.

Humans also rowed the early rafts and boats. Later, they learnt to use the force of the wind, and made sailboats. They also learnt to make use of the force of moving water to run the simple machines they had made.

A sail boat

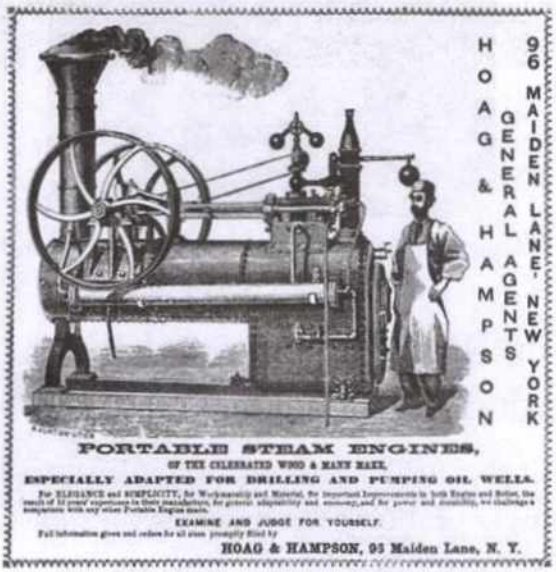
Water mills used the power of water to grind grains into flour

The Steam Engine and the Industrial Revolution

Till about 300 years ago, people used the power of their own muscles, animals, or the force of wind and flowing water to do all work. With the invention of the steam engine, they had a powerful force

to run their machines. As you have read in Chapter 9, faster means of transport became possible with the invention of the **steam engine**. It also became possible to build and run big machines. This provided a tremendous boost to industry.

Earlier, goods were made by hand by people in their houses, using simple tools. Now, with the invention of the large steam-driven machines, goods could be produced in large quantities. These goods were cheaper and of better quality, so more people bought them. As a result, the demand for the goods rose further. This led to the beginning of the **factory system**. Big factories with large machines came up in the cities. Lots of people from villages came to work in these factories, and the cities grew larger.



An advertisement of an early steam engine used to pump oil out of the ground

Smoke from several factories polluting the air during the Industrial Revolution

This significant change from hand-made goods to machine-made goods, which began in Britain in the 18th century, is known as the **Industrial Revolution**. We use the term 'revolution' because of the large-scale changes it brought about in our economy, society and culture. The steam engine was one of the inventions that made the Industrial Revolution possible.

Sources of Energy

Coal was the first fuel used in steam engines to produce steam. Coal is obtained from mines and is still an important source of energy. Large amounts of coal are used in power plants to produce electricity.

Coal is formed in nature from dead trees, but it takes millions of years to

Man working in a coal mine

form. Therefore, the amount of coal on Earth is limited. Experts feel it would last for only about 250 years.

Petroleum is another source of energy found deep inside the Earth. We get fuels such as petrol, kerosene and diesel from it. Engines running on petrol and diesel were found to be more efficient than steam engines. They replaced steam engines in automobiles and machines. However, like coal, the amount of petroleum on Earth is also limited. It may get exhausted in about 100 years.

An early oil well: drilling for petroleum

The battery built by Alessandro Volta

Today, electricity is used to run machines in several factories. About 200 years ago, **Alessandro Volta** became the first person to make a small battery which could produce an electric current in a wire. Later, **generators** were made to produce electricity.

Fuels such as coal, diesel, petrol or natural gas are used to run the generators. Today, the force of flowing water of rivers is also used to generate electricity. This is called **hydroelectricity**. Dams are built across rivers to produce hydroelectricity.

The Three Gorges Dam on the Yangtze River, China

Alternative sources of energy

Besides the fact that we have limited amounts of fuels on the Earth, fuels also cause **pollution** when burnt.

Scientists are therefore developing other sources of energy, where these problems will not arise. Atomic energy, solar energy, the energy of wind, and the energy of flowing water are expected to be used more and more in future.

An old lady working with the spinning wheel

Spinning jenny

Did you know?

In 1764, James Hargreaves invented the spinning jenny, a machine that made it possible to spin more than one ball of yarn or thread at a time. It had eight spindles instead of the one spindle found on ordinary spinning wheels. The spinning jenny spun fibre, like cotton and hemp, into thread that was then used by weavers to make cloth.

I now know

1. The early humans made tools from stones.
2. The first metal to be discovered was copper.
3. Iron, discovered later, made it possible to make much better tools.
4. The invention of the steam engine made it possible to run big machines and produce better goods in large quantities.
5. The change from hand-made goods to machine-made goods in large factories in the 18th century is known as the Industrial Revolution.
6. Coal, petroleum and electricity are used to run machines.
7. There are limited amounts of coal and petroleum on the Earth. So, the search for alternative sources of energy is on.

Words to remember

machine: a device that makes a task easier
industry: production of goods, especially in factories
generator: a machine that produces electricity
hydroelectricity: electricity produced by using the force of flowing water, as in dams

Exercises

A. Fill in the blanks.

1. The first tools used by humans were made out of _____ .
2. It was possible to make tools hard enough to cut trees, after the metal _____ was discovered.
3. One of the important inventions that contributed to the Industrial Revolution was the _____ .
4. In the first steam engines, _____ was burnt to produce steam.

5. _____ are constructed across rivers to produce hydroelectricity.

B. Match the columns.

1.	Copper	a.	Dam
2.	Bronze	b.	First metal to be discovered
3.	Factories	c.	Steam engine
4.	Coal	d.	Mixture of copper and tin
5.	Electricity	e.	Big machines

C. Answer the following questions.

1. Which was the first metal to be discovered? How did the discovery benefit humans?
2. Why is the discovery of iron considered to be very important in the history of humans?
3. What was the effect of the discovery of the steam engine on the industry at that time?
4. What do you mean by the Industrial Revolution?
5. During the Industrial Revolution, cities became larger. Why did this happen?
6. What are the problems in using fuels such as coal and petroleum as sources of energy? How can these problems be solved?
7. What is hydroelectricity? What force is used to generate hydroelectricity?

Multiple choice questions

1. The Industrial Revolution began after the discovery of the
   a. generator b. steam engine c. electricity d. diesel engine
2. In which country did the Industrial Revolution begin?
   a. India b. Britain c. Germany d. USA
3. Which of these are sources of energy used to run machines?
   a. coal b. petrol c. electricity d. all of these
4. Which source of energy does not cause pollution?
   a. coal b. petrol c. solar d. diesel
5. Which metal is most commonly used to make tools?
   a. copper b. aluminium c. tin d. iron

Weblinks

http://www.nettlesworth.durham.sch.uk/time/victorian/vindust.html - for history of the Industrial Revolution

HOTS: Think and Answer

- A factory has machines which are expensive. Then, how can it produce goods that are cheaper than those produced by hand?

Enrichment Activities

- **Write right:** Imagine a world without machines. Write a story about a boy and girl who travel back in time to a world without machines. Do you think that people were happier when there were no machines, than they are today surrounded by machines?
- **Art time:** Create a collage or poster on the topic 'The age of machines'.
- **Role play:** With the help of your teachers, write a play about a small child forced to work in a factory during the Industrial Revolution. Enact it in class.
- **Project work:** While a lot of progress was made during the Industrial Revolution, it also had many bad effects. The workers had to live in overcrowded slums. They had to work long hours in factories with dangerous machines and polluted air. Children, especially, suffered a lot. Find out more about the good and bad effects of the Industrial Revolution and make a project or website on it.

Hands on!

Watch food being cooked in a pressure cooker in the kitchen. When there is too much steam in the cooker, it pushes up the weight kept on top and escapes — when this happens, the pressure cooker 'whistles'. This shows the power of steam. It is this power that is used in a steam engine.

Life Skills and Values

Managing money

Managing your money in a world that is full of things that you may want (but not really need) is an important life skill.

When you get some money to spend, first make a list of things that you really need. Find out their prices at different shops so that you are able to buy them at the best price. See how much you can spend on these things, while keeping some money always with you for an emergency. Go in for a few things you may want, but not really need, only if you have some extra money.

It is a good practice to save some money from every allowance you get. Ask your parents to open an account for you in the bank. Ask them to put the money you saved in your account.

14 Conserving Our Environment

Mind opener

At the end of the day, look at the garbage bin in your kitchen. Is there a lot of waste in it? There are tens of thousands of households in your city. Can you imagine the amount of waste generated by the city in a day? What do you think happens to this waste?

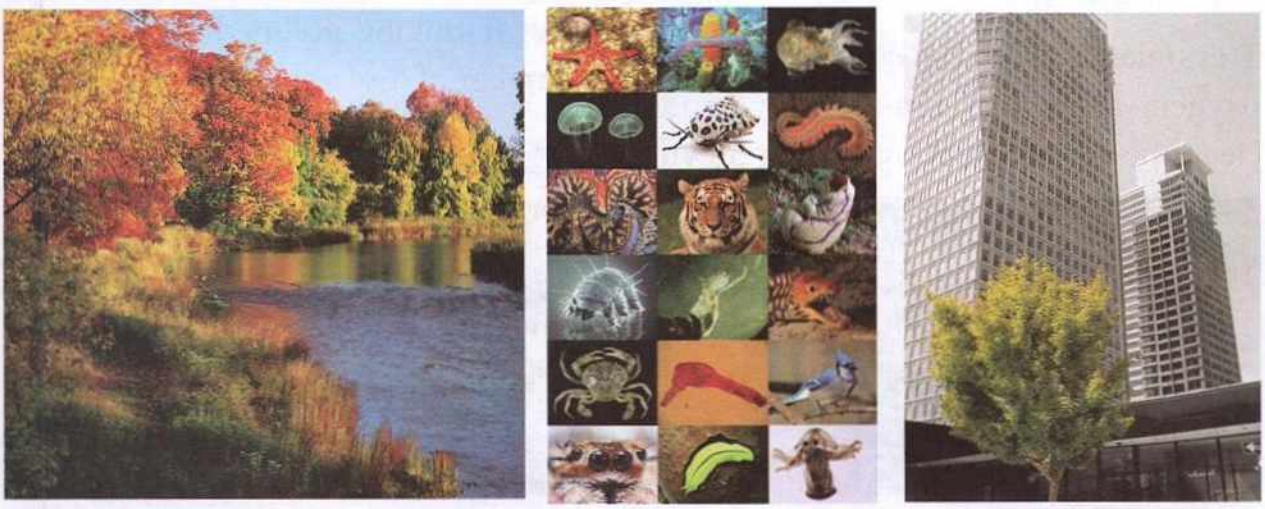
Looking Ahead

In this lesson you will learn about:

- *What is the environment*
- *Pollution and its control*
- *Waste generation and disposal*
- *Kinds of waste: biodegradable waste and non-biodegradable waste*
- *Reducing waste and recycling biodegradable waste*

The **environment** is everything that makes up the surroundings of a living thing. It consists of **living** and **non-living** things—air, soil, water, plants, animals and all other natural resources. It also includes all the human-made things around us like buildings, cars and buses, roads and bridges. We get all the things we need in order to live from the environment.

Humans have found many ways of making their life comfortable. They have created good houses, work saving gadgets such as grinders and washing machines, means of entertainment, good roads, medicines, methods of increasing food production, and fast means of transport and communication. However, in doing so, they have damaged



Our environment includes all the natural and human-made things that surround us

the environment in many ways.

Pollution and its control

Human beings have, over the years, damaged the environment by polluting it. **Pollution** is the contamination or dirtying of the environment by the discharge of harmful substances into the air, water or soil. By damaging the environment, we are destroying our own future. We should, therefore, do all we can to control pollution and protect the environment.

Air pollution

The burning of fuels in houses, factories and vehicles adds smoke and poisonous substances in the air, causing **air pollution**. The burning of carbon-based fuels like wood and petrol increases the levels of carbon dioxide in the air. Increasing levels of carbon dioxide in the air is believed to cause **Global Warming** and **climate change**.

Trees take in carbon dioxide and give out oxygen. Trees, therefore, recharge and clean the atmosphere. By cutting down forests to build houses and factories, we have damaged the environment.

Air pollution can be controlled by reducing the burning of fuels, using filters in factory chimneys to filter out harmful substances and by afforestation.

Did you know?

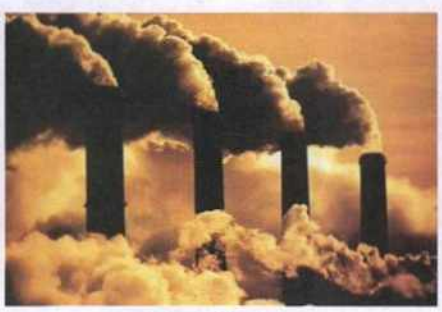
Over the past few years the Earth has been slowly heating up. This is called **Global Warming**. It happens when there is an increase in the amount of gases like carbon dioxide and methane in the atmosphere. These gases trap heat and light from the Sun in the atmosphere, thereby increasing the Earth's temperature. Global warming is damaging our environment. Glaciers and the polar ice caps are melting faster than ever. Some animals and plants that could not handle the change have died.

Water pollution

Wastes from our homes and factories are dumped into rivers, lakes and seas causing **water pollution**. This affects the plants and animals living in the water. Drinking polluted water causes a number of diseases.

Water pollution can be reduced by

Pollution destroys the environment



Air pollution

Air pollution on the roads of Beijing

Untreated water from a factory pouring into a lake

Dumping garbage

treating sewage and wastes from factories before disposing them in water bodies.

Land pollution

Wastes are also often thrown or buried in land, causing **land pollution**. Land pollution is also caused by excessive use of fertilisers and pesticides. When the fertilisers and pesticides are washed into the rivers, they also cause water pollution.

Land pollution can be reduced by managing garbage better and by controlling the use of fertilisers and pesticides.

Waste generation and disposal

Any material that is no longer useful to us is called **waste**. It can consist of fruit and vegetable peels, old newspapers and magazines, cardboard boxes, plastic packaging material, glass bottles and broken glass, metal cans, and many other things.

The disposal of the waste produced in a city is a big environmental problem. When waste is not disposed properly, germs and diseases spread. The waste cannot be disposed in a river or a lake as it pollutes the water. Burning of waste pollutes the atmosphere. If it is buried in land, it pollutes the land and groundwater. Therefore, it is important to dispose the waste properly.

Kinds of waste

We generate two kinds of waste.

Biodegradable waste: This is waste obtained from plants and animals such as vegetable and fruit peels, meat and bones, flowers, leaves and paper. Biodegradable waste rots and finally mixes with the soil.

Non-biodegradable waste: This is waste that does not rot, such as plastic bags, plastic packaging materials, metal cans, glass bottles and broken glass pieces. The two kinds of waste are disposed in different ways.

Biodegradable waste

Non-biodegradable waste

Reducing waste and disposing it properly are necessary to conserve the environment.

Reducing waste

To conserve the environment, we should follow the policy of the **4Rs**—**R**efuse, **R**educe, **R**euse and **R**ecycle.

Refuse: Refuse things that add to garbage. For example, when you go shopping, take your own cloth bag and refuse the plastic bag given by the shopkeeper.

Reduce: Reduce the use of things that create garbage. We often buy more than we need and end up throwing out some of it. For example, if we buy too many vegetables, some of them rot and have to be thrown away, thereby increasing garbage. If you buy only as much as you need, you will reduce garbage.

Reuse: Instead of throwing away plastic bottles, they can be used to store water. Empty jam or pickle bottles can be used to store things in the kitchen. Plastic bags can be used again and again. Thus, waste can be reduced by reusing things instead of throwing them away.

Recycle: Things that cannot be reused can be used to make other useful things. This is known as **recycling**. The waste collector (kabadiwala), who often visits our home to buy old newspapers, magazines, plastics, glass and metal wastes takes them to places where they are used to make new things. Old newspapers are used to make paper bags. Plastic, metal and glass pieces are melted in factories and made into new things. Paper is also recycled. Recycling can save resources as well as energy.

If we follow the 4Rs policy in our daily life we can help to keep the environment clean and healthy.

Recycling biodegradable waste

Biodegradable waste can be used to help the environment. It can be converted into manure for plants by a process called **composting**. It consists of burying the waste in the soil for about two months. It rots and changes into manure called **compost**, which is excellent for plants.

Did you know?

Residents of Anandwan, an institute started by Baba Amte in Warora, Maharashtra, are experts at recycling waste. They collect plastic bags and other re-usable trash. These are cut into small pieces till the plastic feels like cotton. This 'Plastic Cotton' is used to fill mattresses and pillows.

Paper, which is made from wood, can be recycled. This saves more trees from being cut.

Help reduce pollution

You can help reduce pollution by doing the following things

- Plant a tree for every tree cut down.
- Walk or cycle short distances to save fuel. Besides saving natural resources, this also reduces pollution.
- Do not waste electricity. Saving electricity also saves fuel.
- Use alternate sources of energy, such as solar energy, as far as possible. For example, install a solar heater on the rooftop of your house. Alternate sources of energy do not cause pollution like conventional sources of energy do.
- Be careful about the use of pesticides and insecticides at home.
- Manage your household waste better.

I now know

1. Environment includes everything that makes up the surroundings of a living thing.
2. Pollution damages the environment. We must try to reduce pollution.
3. We can reduce air pollution by burning less fuel, using filters in factories to filter out harmful substances, and by afforestation.
4. Water pollution can be reduced by treating sewage and wastes from factories before disposing them.
5. Land pollution can be reduced by managing garbage better, and by regulating the use of fertilisers and pesticides.
6. Biodegradable waste rots and mixes with the soil.
7. Non-biodegradable waste does not rot.
8. To conserve the environment, the policy of Refuse, Reduce, Reuse and Recycle should be followed.

Words to remember

contaminate: to make impure or unclean

pollution: the contamination of the environment by the discharge of harmful substances into the air, water or soil

biodegradable: things that can rot, or be decomposed by biological agents like bacteria

non-biodegradable: things that cannot rot or decompose

compost: waste that rots and is used as manure for the plants

Exercises

A. Match the problems to their solutions.

1. Land pollution	a. treating sewage
2. Broken glass disposal	b. air filters in factories
3. Water pollution	c. recycle
4. Air pollution	d. reduce purchase
5. Fruits rotting at home	e. proper disposal of garbage

B. Fill in the blanks.

1. Everything around us makes up our _____ .
2. Burning of fuels causes _____ pollution.
3. Drinking polluted water can cause several _____ .
4. Waste paper is _____ (biodegradable/non-biodegradable).
5. When you use a plastic bottle to store water in the refrigerator you are _____ (reusing/recycling) the bottle.
6. Rotting of leaves can produce manure called _____ .

C. Answer the following questions.

1. What are the main causes of air pollution? How can it be reduced?
2. How can water pollution be reduced?
3. Write three ways in which we can contribute to reducing pollution.
4. Explain the difference between biodegradable and non-biodegradable waste. Give three examples of each.
5. How can 'refusing' result in reduction of garbage?
6. Give two examples of 'reuse'.
7. How should waste like metal and glass pieces be disposed off?
8. What is composting? What are its advantages?

Multiple choice questions

1. Which of the following is biodegradable?
   a. leather belt b. silver foil c. iron nail d. plastic mug
2. Which of these is not human-made?
   a. house b. bridge c. mountain d. telephone
3. Which of these natural resources is most affected by increasing fuel consumption?
   a. water b. air c. soil d. forests
4. Saving electricity helps the environment by reducing consumption of
   a. water b. air c. fuels d. soil
5. Which of these will not rot even if left for a long time?
   a. cloth bag b. plastic bag c. paper bag d. leather bag
6. When composting biodegradable waste, which of the following are you doing?
   a. refusing b. reducing c. reusing d. recycling

Weblinks

Many websites are dedicated protecting our environment. Visit http://www.treehugger.com/files/2008/04/time-magazine-top-15-green-websites.php to find a list of the top fifteen green websites.

On the site http://www.ecohearth.com/ you can blog and receive free online newsletters that offer tips on how people can help the environment.

HOTS: Think and Answer

- A clean river was found to become polluted after crossing a city. Explain why.
- Rising sea levels is one of the consequences of Global Warming. Why is that so? How can the rising temperature of the Earth cause the sea level to rise?

Enrichment Activities

- **Speak out:** Talk about the measures we can take to save:
  a. water b. electricity c. petrol d. trees
  How many of these measures do you follow in your daily life? Discuss with your teachers and classmates.
- **Write right:** Write an article for a magazine on Global Warming. You can find out more about Global Warming from the Internet or from books in your library.

- **Art work:** Design a poster on the theme 'Save the Environment'.
- **Find out:** What was the Chipko Movement? Find out more about it.
- **Role play:** Enact a play based on the Chipko Movement. A tree in your area is being cut. Enact a play about how you and your friends saved the tree.
- **Project work:** Working in groups, do a project on any one form of pollution: air, water or land. Either prepare a report or create a website based on your findings.

Hands on!

Make recycled paper

1. Take old newspapers and magazines. Tear them into small pieces.
2. Take warm water in a bucket and add a little starch to it. Soak the paper in the water for 5-6 hours.
3. Take the paper out of the water and pound it with a mortar and pestle till it becomes soft and fluffy. Add more starch to it to thicken it.
4. Spread this pulp on a fine wire mesh, and press it to squeeze out the excess water. Carefully turn the wire mesh upside down on a smooth surface, and put some weights on it. Let the pulp dry for several hours.

Once it dries up, your hand-made recycled paper is ready! You may not be able to write on the recycled paper, but you can draw on it.

Life Skills and Values

Make your own compost

To make a compost pit, select a cool, shaded corner of the garden. Dig a pit, about 3 feet deep. Put vegetable and fruit peels, leaves, paper, flowers, etc. into the pit. Each time you add waste to the pit, cover it with a layer of dried leaves or a thin layer of soil. When the pit is full, cover it with a layer of soil and leave it for about 2 months.

The garbage will rot to form compost. Use it in your garden or in your flower pots.

15 Natural Disasters

Mind opener

A traffic accident causes injury or even death. It also damages the vehicles involved. How is a traffic accident different from the destruction caused by earthquakes?

Looking Ahead

In this lesson you will learn about:

- *Various natural disasters*
- *Disasters caused by earthquakes, floods, cyclones and droughts*
- *The precautions taken during natural disasters*

A **natural disaster** is a calamity caused by nature. Floods, volcanic eruptions, earthquakes, tsunamis, droughts and hurricanes are all examples of natural disasters. They cause immense damage to human life and property. Let us learn about some of these natural disasters.

Earthquakes

When an earthquake occurs, the ground shakes. An earthquake is a sudden tremor on the Earth's surface. It is caused by movements deep inside the Earth.

Natural disasters are caused by nature

A severe earthquake can cause death and widespread destruction. Buildings collapse, roads cave in, trees fall and bridges break. There may be fires because of the snapping of electric wires, and floods because of the bursting of dams. After an earthquake, people have to live in tents for many weeks till they can build their houses again.

Large parts of India are prone to earthquakes. The regions that face the greatest risk include the Himalayan region, and parts of Gujarat and Bihar. A massive earthquake in Gujarat on 26th January 2001, caused severe devastation. About 20,000 people died. Many were rendered homeless and lost all their belongings.

The study of earthquakes is called **seismology**. Instruments called **seismographs** record the shaking of the land. The intensity of an earthquake is measured from 1 to 10 on a **Richter Scale.** Earthquakes of intensity 3 or less on the Richter Scale are of low intensity.

Widespread destruction after the earthquake in Gujarat

Such earthquakes occur almost everyday around the world. They do not cause much damage. An earthquake of intensity 6 or above will cause massive destruction.

While constructing buildings and bridges, care must be taken to see that the designs are earthquake proof. Such buildings and bridges sway with the earthquake but do not collapse.

Precautions

An earthquake can be felt by the shaking of the ground and swaying of fans or pictures on the wall. If you feel an earthquake:

- If you are outside, move into an open area away from buildings and trees; they can fall on you and hurt or trap you.
- If you are inside a building, do not try to run out. Drop down, and crawl under a strong table or a bed to protect yourself from falling objects.
- Try to keep doors open so that they do not get stuck later when you want to get out.
- Never use lifts during an earthquake; instead, always use the stairs. Lifts can stop working if the electricity gets cut off.
- Do not go back inside a building immediately after an earthquake, as it is sometimes followed by smaller **tremors** of the Earth.

A street flooded with water

A satellite picture of a cyclone

Strong winds and rain cause havoc during a cyclone

Floods

Sometimes, when it rains a lot, rivers get filled with water. They start rising and finally overflow their banks. The water then flows into nearby land, causing floods.

In most parts of our country, we get very heavy rains during the monsoon and the occurrence of floods is common during these months. Floods in the Northern Plains are also caused by the melting of snow in the mountains during summer.

Floods damage crops, roads and buildings. They affect electricity and water supply, transport and communication. There is a shortage of food, drinking water and shelter. The unhygienic conditions often lead to outbreak of diseases such as cholera, diarrhoea and malaria. Many people and animals may drown or die due to hunger, thirst and diseases.

But floods also have some advantages. Flood water brings with it new soil from the hills. It spreads out over the land when there are floods and makes the land more fertile.

In India, states like Uttar Pradesh, Assam, Bihar, and West Bengal are frequently affected by floods.

Precautions

Watch out for warnings of flood in the newspapers, radio and television. In case of a flood, prepare to move out of your house to a safer place on higher ground. Build up your store of food, water and essential medicines.

High embankments constructed along rivers in populated areas prevent flood waters from entering the land.

Trees slow down the speed of water currents. Therefore, afforestation is important for flood control. Dams are built over rivers to check the flow of water and prevent floods.

Cyclones

Coastal areas often face the fury of cyclones. A cyclone is a very strong wind accompanied by very heavy rain. The

Indian army helping people during floods

strong wind often causes high waves, called **tidal waves**, in the sea, which lead to flooding of the coastal areas.

The states of Odisha, Andhra Pradesh, West Bengal, Gujarat and Maharashtra are often hit by cyclones and floods.

Precautions

A good weather forecasting system can predict cyclones, and warn people in advance through television, radio and newspapers. This will give people time to move to safer places. They can also take their animals and other belongings with them.

Taking care

The army is often called in to evacuate people who are affected by the cyclone. They use helicopters to airlift stranded people, or to airdrop food and medicines for them.

The government and other agencies such as the **Red Cross** set up relief camps for the displaced people. Food, drinking water, medicines etc. are provided to them. Doctors are put on duty to control the outbreak of diseases.

Did you know?

Check-dams are small dams built across shallow rivers and streams. They retain excess water during monsoon rains in a small reservoir behind the dam. A part of the water seeps into the ground and replenishes groundwater. Check dams do less damage to the environment than large multipurpose dams.

Droughts

In most parts of our country, the summers are very hot with very little rainfall. The monsoon follows, bringing welcome rain. However, sometimes the rains fail during the monsoon in some regions. This causes severe shortage of water in the region.

Rivers and ponds dry up and crops cannot grow. Livestock and other animals perish due to shortage of fodder and water. Such a condition is called a **drought**.

Villagers in drought-hit Gujarat working on a government funded relief project (picture credit: IFRC)

Several regions in our country are prone to droughts, such as parts of Maharashtra, Andhra Pradesh, Karnataka, Gujarat, Odisha and Rajasthan.

In severe droughts, people may even die because of shortage of food. This is known as a **famine**. There may also be widespread diseases leading to **epidemics**.

Prevention

Afforestation, or the planting of trees, increases rainfall and reduces the incidence of drought, as has been shown in parts of Rajasthan.

Water harvesting can increase the underground water level and help us in times of drought. Dams on rivers store excess water in reservoirs. This water can be used in times of drought.

Tsunami

A tsunami is a series of very high waves created by some disturbance under the sea, such as underwater earthquakes, volcanic eruptions or landslides.

The waves in a tsunami can range in height from 1 metre to 20 metres or more. They travel very fast—up to hundreds of kilometres an hour. Therefore, they strike suddenly and cause great damage.

One of the biggest natural disasters ever was the tsunami that hit several countries of South and South-East Asia on 26 December 2004. Almost 3,00,000 people were killed.

Swimmers try to run away from the huge tsunami waves in Indonesia

Tsunami warning systems warn of tsunamis in advance. On receiving a tsunami warning, people living near the coast should be immediately shifted to higher grounds. They should stay there until it is considered safe.

Relief work during a natural calamity

The government organises relief work for the victims of a natural calamity. The National Disaster Management Authority (NDMA), frames policies and lays down guidelines for efficient disaster management. The National Disaster Response Force (NDRF) is a specially trained force that helps communities deal with natural disasters. Non-government organisations (NGOs), such as Red Cross Society and World Health Organisation (WHO), too help people during a natural calamity.

It is also the duty of all of us to help as much as we can by doing voluntary work. We could also contribute money, food and clothes to the agencies involved in relief work.

I now know

1. Natural events that cause damage to human life and property are called natural disasters.
2. Earthquakes are caused by sudden movements below the Earth's surface.
3. Heavy rains or melting snow cause rivers to overflow their banks, flooding nearby areas.
4. Cyclones are high winds accompanied by heavy rain. They cause flooding and widespread destruction in coastal areas.
5. Failure of rains can lead to a drought.
6. A tsunami is a series of very high waves in the sea created by undersea disturbances.
7. Several government and non-government organisations organise relief work during a natural disaster.

Words to remember

disaster: an event that causes great damage to human life and property
seismology: the study of earthquakes
cyclone: very strong wind accompanied with heavy rain
famine: a situation where shortage of food causes large scale deaths of humans
epidemic: a large scale outbreak of disease

Exercises

A. Write T for true and F for false sentences.

1. During an earthquake, it is best to take shelter under a tree.
2. The flood waters of a river are beneficial for the soil.
3. Flooding due to cyclones occurs in coastal areas.
4. A tsunami is a massive earthquake.
5. Deforestation increases rainfall and reduces the incidence of drought.

B. Fill in the blanks.

1. A flood is a natural _____ .
2. _____ are caused by tremors inside the Earth's surface.
3. A _____ is very strong wind with very heavy rain in coastal areas.
4. Diseases are likely to break out after floods due to _____ after the flood waters recede.
5. The intensity of an earthquake is measured on the _____ scale.
6. An earthquake under the sea bed can cause a series of high waves in the sea called a _____ .

C. Answer the following questions.

1. What is a natural disaster?
2. Why do earthquakes occur?
3. What should you do if you feel an earthquake while you are in the house?
4. Give two reasons why floods occur.
5. What is a cyclone?
6. What steps can be taken to prevent the occurrence of drought?
7. Why is there food shortage during a drought?
8. What are the possible causes of a tsunami.
9. Name two non-government organisations that help people during a natural disaster.

Multiple choice questions

1. Which of these is not a natural disaster?
   a. fire in a forest caused by lightning
   b. fire in a house caused by electrical short circuit
   c. flooding due to tidal waves in the sea
   d. drought caused by lack of rain
2. Which of these is a safe place during an earthquake?
   a. near an electric pole b. at home under a table
   c. at home on the roof d. under a tree
3. Which of these gets affected during floods?
   a. crops b. roads c. transport d. all of these
4. A cyclone causes:
   a. floods b. earthquake c. fires d. drought
5. Deforestation makes a region more prone to (more than one answer could be correct)
   a. earthquakes b. floods c. drought d. cyclones
6. Which of these will not help prevent a drought?
   a. deforestation b. building of dams c. water harvesting d. afforestation

HOTS: Think and Answer

- A newspaper headline reads: 'Flooding in Delhi due to cyclone'. Why is this likely to be fake news? Think and answer.
- A severe drought in the Northern Plains of India is likely to affect all the people of India, even those staying far away. Do you agree? Give reasons.

Enrichment Activities

- **Speak out:** Have you ever experienced a natural disaster? How did you manage to escape? Did anyone you know get hurt? Describe the disaster to your classmates.
- **Write right:** Write a diary entry describing your experiences during an earthquake that struck your city.
- **Find out:** Find out what kind of a natural calamity your state is prone to, and what precautions have been taken by the government to prevent or manage the disaster.
- **Art work:** Design a poster with a catchy slogan to raise funds for flood victims.
- **Project work:** Work in groups. Collect newspaper and magazine clippings of reports and pictures related to any one natural disaster in the country.

Hands on!

Make a first aid box

Take a red plastic lunch box. Wash it thoroughly with soap and dry it. Neatly arrange the following things in the box.

box of assorted adhesive bandages, package of sterile gauze, sterile bandages, sterile cotton, antibiotic ointment, small scissors, tweezers, thermometer, small bottle of antiseptic lotion (Dettol or Savlon)

Life Skills and Values

Being aware, helpful and responsive

- What help can you provide during a natural disaster, for e.g., collect clothes, medicines, blankets? Discuss with your classmates.
- Find out the telephone numbers of your nearest police station, fire station, ambulance service, hospital and local Disaster Management Authority. Keep these handy for any emergency.

16 Some People Never Die

Mind opener

Do you sometimes hear the names of people who are no longer alive, being talked about at home or on television? Why do you think these people are remembered even after their death?

Looking Ahead

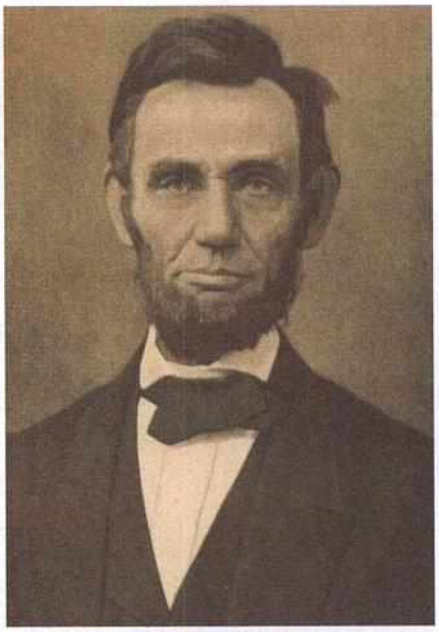
In this lesson you will learn about some great people who have made a difference in our lives:

- *Abraham Lincoln*
- *Martin Luther King*
- *Mahatma Gandhi*
- *Mother Teresa*

Out of the millions and millions of people in the world, there are only a few who become great. They may be rulers, religious leaders, social workers, scientists, or others who improve the lives of the people by their teachings or work. We remember these people long after their death. They always live in our memories. Let us read about some people who made a difference in our lives.

Abraham Lincoln

Abraham Lincoln was born in the year 1809, in a very poor family in the USA. He spent much of his childhood helping his parents in their work. He attended school for less than one full year in his entire life.



Abraham Lincoln

However, he had a great desire to learn, and was encouraged by his stepmother to read and write. He read the few books he could get, over and over again. At the age of 22, he settled in the state of Illinois. After trying his hand at various jobs, he became a lawyer. He was very successful as a lawyer. At the age of only 25, he was elected to the Illinois House of Representatives. (This was like the State Legislative Assemblies in India.)

At that time, **slavery** was common in the USA. People from Africa, who were called 'Negroes' (a disrespectful term that is no longer used) or 'Blacks', were kept as slaves by the white people. They could be bought and sold in the market. They were treated badly, made to work long hours, and their living conditions were very bad. Lincoln was against slavery. This made him unpopular in the southern states of the USA where people favoured slavery.


TO BE SOLD, on board the Ship *Bance-Iſland*, on tueſday the 6th of *May* next, at *Aſhley-Ferry*; a choice cargo of about 250 fine healthy

NEGROES,

juſt arrived from the Windward & Rice Coaſt. —The utmoſt care has already been taken, and ſhall be continued, to keep them free from the leaſt danger of being infected with the SMALL-POX, no boat having been on board, and all other communication with people from *Charles-Town* prevented.

Auſtin, Laurens, & Appleby.

N. B. Full one Half of the above Negroes have had the SMALL-POX in their own Country..

An advertisement for the sale of slaves

In 1860, Lincoln was elected President of the USA. After his election, many states in the south wanted to break away from the USA and announced that they would form a separate nation. This led to a war between the northern and southern states, which lasted four years. It is called the **American Civil War**. The war was won by the northern states backed by Lincoln, and the USA remained a united country.

Even before the war ended, Lincoln made an announcement giving freedom to the three million slaves in the USA. Two years later, a law was passed banning slavery in the USA. Lincoln was elected President for the second time. He wanted people to live in peace and unity. He made plans to remove the differences between the northern and southern states.

But before he could carry out his plans, he was shot dead by a supporter of the southern states.

Mahatma Gandhi

Mohandas Karamchand Gandhi was born on 2 October 1869 at Porbandar in Gujarat. At that time, the British ruled India. He studied law in England. He then went to South Africa and became a successful lawyer. South Africa was also ruled by the British at that time.

The Blacks of Africa and the Indians living there were treated badly by the British. Gandhiji decided to fight against this injustice. He developed his own method of fighting against injustice. He opposed injustice by using non-violent methods of protest. This method was called **Satyagraha**. Satyagraha in Sanskrit means 'truth and firmness'. His methods were successful, and he became very well known in South Africa and India.

Gandhiji in South Africa

Gandhiji launching the Satyagraha Movement in Champaran, Bihar

Gandhiji returned to India after spending more than 20 years in South Africa. He decided to continue his struggle against the unjust British rule in India using the weapon of Satyagraha. He launched his **Non-Cooperation Movement** in India in 1920. It spread rapidly all over India and soon had millions of followers. Under this form of protest, people silently opposed the British and did not become violent even when beaten by the police.

Gandhiji was arrested, but the British were soon forced to release him. Later, Gandhiji started many other movements against the British. Ultimately, the British had to bow before the might of non-violence, and India became free of British rule on 15 August 1947.

Gandhiji was against the practice of untouchability in India. He worked to improve the condition of the oppressed. He also worked for Hindu-Muslim unity in India, and was heartbroken when India was partitioned into India and Pakistan. Gandhiji was shot dead on 30 January 1948 by a person who did not like his methods. Gandhiji is remembered throughout the world as a great soul. He is called Mahatma Gandhi. 'Mahatma' means the 'great soul'.

Did you know?

So impressed was Rabindranath Tagore with Gandhiji's work for the uplift of the poor and downtrodden that he decided to call him Mahatma or the 'great soul'.

Martin Luther King

Even after slavery was banned in the USA, the Blacks were treated badly. They were not considered to be equal to the Whites. In several places, buses had separate seats for Blacks and Whites. Blacks were not allowed in several eating places. Martin Luther King was the main person who fought against this

Martin Luther King addressing the crowds at Washington, 1963

Martin Luther King giving his famous speech 'I have a dream...' during the 1963 "March on Washington"

injustice. He was born in the southern state of Georgia in USA, in 1929.

Martin Luther King visited India in 1959 to understand Gandhiji's Satyagraha Movement. He used Gandhiji's non-violent methods of protest, demanding equality for the Blacks in the USA. He gained tremendous support among the Blacks.

On 28 August 1963, about 2,00,000 people joined him in his '**March on Washington**'. A year later, a law was passed in the USA granting equality to the Blacks. King was given the Nobel Peace Prize for his efforts. However, in some states the injustice towards Blacks continued. In Alabama, some white officials prevented Blacks from voting in the elections. The people joining King's protest march were beaten by the police. But the protest continued.

Soon a law was passed which ensured that the Blacks could not be stopped from voting. Martin Luther King was shot dead in 1968 at the young age of 39. But, during his lifetime he made it possible for a whole race of people to live with dignity.

Mother Teresa

Agnes Gonxha Bojaxhiu was born in 1910. She became a nun when she was only 12 years old and was given the name Teresa.

At the age of 18, she was sent to India to teach at a convent in Kolkata. One day she felt as if God was telling her to work for the poorest people of the city. She left the convent and moved into the slums of Kolkata. She started to look after the poor and needy children.

In 1950, she and the people working with her set up a new order called **Missionaries of Charity**. They took a vow to serve the poor. She believed that serving the poor meant serving

Mother Teresa with the homeless poor in Kolkata

Christ himself. Over the years, the Missionaries of Charity opened schools, orphanages, homes for people with leprosy, and homes for the dying poor in India and other countries.

For her selfless service for the poor, Mother Teresa received many awards. Among them are the Bharat Ratna from the Indian government, the Magsaysay Award and the Nobel Peace Prize. She died in the year 1997. But she will live forever in the memory of the people, especially the poor.

Mother Teresa with a child

I now know

1. Abraham Lincoln fought and won the battle against slavery in the USA.
2. Mahatma Gandhi's method of Satyagraha won India its freedom.
3. Martin Luther King used Gandhiji's non-violent methods of protest to win equality for the Blacks in the USA.
4. Mother Teresa is remembered for her selfless service to the poor people of Kolkata.

Words to remember

slave: a person who is 'owned' by someone else and is forced to work for that person without payment

movement: (Here) an effort by a large group of people to achieve something, especially a reform in society

convent: a place where nuns live

charity: money or help given out of kindness to the poor and needy

Exercises

A. Answer the following questions.

1. Why did many people in the southern states of the USA dislike Abraham Lincoln?
2. What important announcement did Lincoln make during the Civil War in the USA?

3. What do you understand by the word 'satyagraha'?
4. Name two things Gandhiji is remembered for, other than the fight against the injustice of the British rule in India.
5. Who inspired Martin Luther King to adopt non-violent methods of protest?
6. What was the importance of King's March on Washington?
7. Why did Mother Teresa start working for the poor?
8. What vow did the Missionaries of Charity take?

B. Match the columns.

1. President of the USA	a. Martin Luther King
2. 'Great soul'	b. Mother Teresa
3. March on Washington	c. Abraham Lincoln
4. Bharat Ratna	d. Mahatma Gandhi

Multiple choice questions

(Some of the questions could have more than one correct answer.)

1. Who among these fought against the practice of slavery?
   a. Abraham Lincoln b. Mahatma Gandhi
   c. Mother Teresa d. Martin Luther King
2. In the Satyagraha movement, Gandhiji told the people to fight against the British using
   a. force b. arms c. peaceful methods d. combination of all these methods
3. Which other leader used Gandhiji's method to fight injustice?
   a. Abraham Lincoln b. Mother Teresa c. Martin Luther King d. all of them
4. Which of these leaders was shot dead by someone opposing the cause he was fighting for?
   a. Abraham Lincoln b. Mahatma Gandhi c. Martin Luther King d. all of them

Weblinks

http://www.biography.com/bio4kids/bio4kids-meet.jsp
http://www.pitara.com/magazine/people.asp

HOTS: Think and Answer

- What do you think would have happened if the southern states had won the American Civil War?

- Abraham Lincoln, Mahatma Gandhi and Martin Luther King were all people who worked for the good of people. Even then they were shot dead by people who must have had hatred towards them. Why do you think such good people were hated by some?

Enrichment Activities

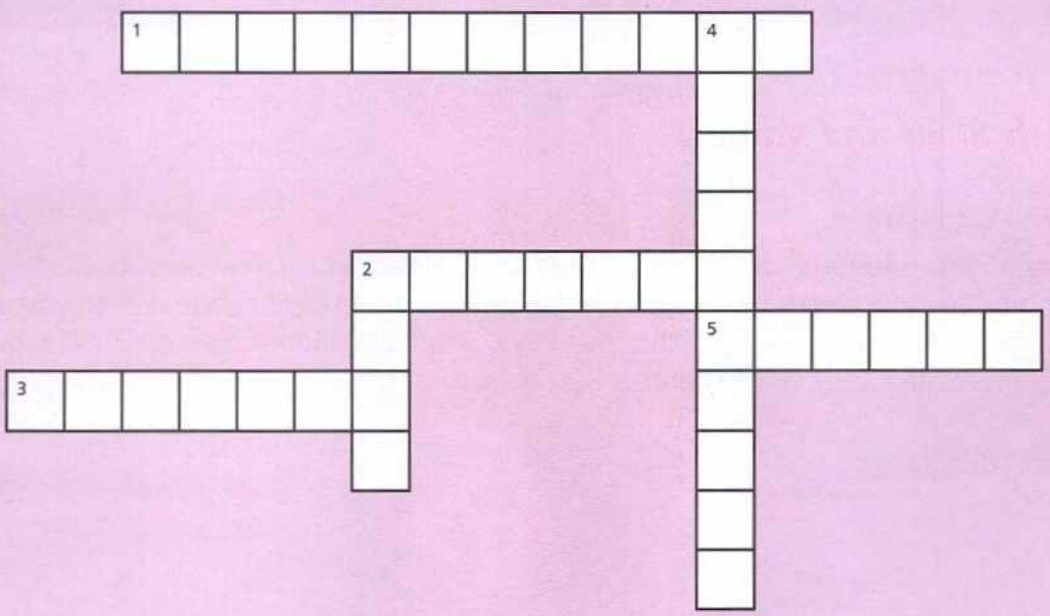
- **Puzzle time:** A. Complete the crossword using the clues given below.

Across

1. Founded Missionaries of Charity
2. City where Mother Teresa worked
3. Fought against slavery in the USA
5. Fought against discrimination of Blacks and Indians in South Africa

Down

2. Equality for the Blacks
4. Non-violent protest



- **Speak out:** Learn Martin Luther King's famous speech 'I have a dream...' or Abraham Lincoln's Gettysburg Address. Say as much of the speech as you can in class. Speak loudly and clearly, and with the right emotions. You can find the speeches at http://www.famousquotes.me.uk/speeches/
- **Write right:** Write about any famous Indian whom you admire. Explain why you admire the person and how their life has influenced you.

- **Find out:** Find out about three other great people who are no longer alive, but whose memory lives in the minds of people.
- **Project work:** Find out more about slavery in America as it existed a few hundred years ago. Work in groups of four and prepare a report on your findings.

Hands on!

Make a difference

Are you satisfied with the cleanliness of your neighbourhood park? If not, you can organise a cleanliness drive with your friends that will make all the people of the neighbourhood happy.

Gather your friends and motivate them to participate in the cleanliness drive. Get permission from parents and neighbours before you begin. You will need trash bags, brooms and dustpans. Equip each friend with these and set off to clean the neighbourhood park. Using the broom and dustpan, sweep the mess into the trash bag. Make sure you wear protective gear like masks, boots and gloves.

You'll feel like a hero and the park will reflect how much you care.

Life Skills and Values

Learning to care

Many of you celebrate your birthday with friends having a party. On your next birthday, celebrate your birthday with the children of an orphanage. When you see how happy they are with the little they have, you will feel humbled. You will enjoy the party more, and they will remember you for a long time.

17 The United Nations

Mind opener

When you fight with your brother or sister, your parents stop the fight. They explain to you why you should not fight. If you have a complaint against someone in school, you go to your teacher. If two countries have problems with each other, who will mediate and stop the dispute?

Looking Ahead

In this lesson you will learn about the UN:

- *How and why it was created*
- *Its aims and principles*
- *Its main organs and its special agencies*
- *Its achievements*
- *India's contributions to the UN*

The World Wars

World War I broke out in August 1914. It was a terrible war in which several nations of the world were involved. The War started in Europe when the industrialised nations of the world became jealous of each other's powers. Each country wanted its own empire to grow. Millions of soldiers and other people were killed or wounded. Cities were destroyed and there was a severe shortage of food.

After a few years of peace, **World War II** broke out in September 1939. It ended in 1945 after USA dropped atomic bombs over two Japanese cities—Hiroshima and Nagasaki. The loss of life and the destruction of cities in World War II was much greater than in World War I.

Destruction of London during World War I

The devastation of Hiroshima after the nuclear bomb was dropped on it

The Formation of the United Nations

After World War II, the nations of the world came together to find ways of preventing wars in future. The tremendous destruction and misery of the two wars had made them wiser. As a result of their efforts, the **United Nations** was born in the year 1945. A set of rules, called the **Charter of the United Nations**, was made at a conference in San Francisco, USA. It was signed by 50 member countries on 24 October 1945. Today, 193 countries are members of the United Nations.

Did you know?

South Sudan is the newest country to join the UN. South Sudan became independent on 9 July 2011.

Aims of the UN

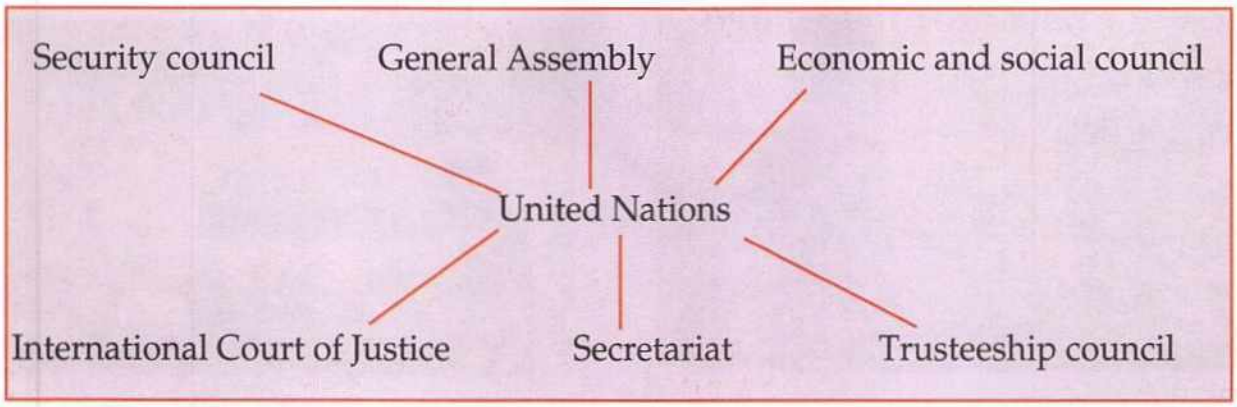
According to the Charter of the UN, its aims are:

- **To maintain international peace and security:** The main aim of the United Nations is to prevent war. Disputes are discussed at the meetings and efforts are made to find peaceful solutions.

  Sometimes, when there is danger of war between two nations, the UN sends a military force called the **Peacekeeping Force** to prevent war.

The United Nations building in New York

- **To develop friendly relations between nations**
- **To encourage respect for human rights and the freedom of all the people:** All member nations of the UN are expected to ensure that human rights are upheld in their country.
- **To achieve international cooperation in solving economic and social problems:** It believes that the world can have lasting peace only when all the nations of the world achieve progress and development. Therefore, it expects the richer nations to help the poorer countries improve their living conditions. It also helps to improve education in these countries.
- **To help fight diseases and preserve the environment**



The Principles of the United Nations

- All countries that are members of the UN are equal, however developed or underdeveloped they may be.
- All countries that are members of the UN must obey the Charter.
- Countries must try to settle their differences by peaceful means.
- The UN will not interfere in the domestic affairs of any country.

Structure of the UN

The UN has six different **organs** or bodies, that have different functions. They are:

1. The General Assembly
2. The Security Council
3. The Secretariat
4. The Economic and Social Council
5. The International Court of Justice
6. The Trusteeship Council

Let us study in brief the working and responsibilities of the main organs.

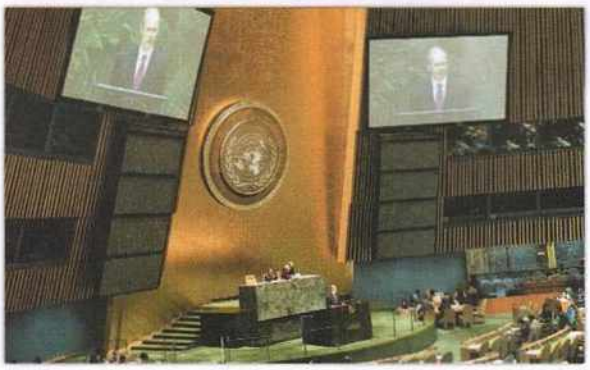
The General Assembly

The General Assembly is the main organ of the UN. It is made up of all 193 member countries. Each country has one vote. It meets every year. Discussions on all actions of the UN are held in the General Assembly. Every member country can put forward its ideas and opinions. Based on the discussions, decisions are taken on what actions should be taken.

Members decide routine matters with a simple majority vote (more than half the votes). Important decisions require a two-thirds majority. However, it is not compulsory for the member nations to follow the recommendations of the General Assembly.

The Security Council

The Security Council is the most powerful organ of the UN. It is responsible for maintaining international peace, and for restoring



A session of the UN General Assembly in progress

A session of the UN Security Council in progress

peace if a war breaks out. The Council meets whenever there is a threat to peace. It may also meet if a nation has a complaint against another nation. All the member countries have to accept its decisions.

The Security Council has 15 members. Five of them have **permanent seats**. These are the United States of America, United Kingdom, France, Russia and China. These permanent members have the power to **veto** or overrule any majority resolution. The other 10 members are elected, each for two years.

The Secretariat

The people who work in the UN, that is the staff members, form the Secretariat. It carries out the day-to-day work of the UN. The head of the Secretariat is the **Secretary-General**. He or she carries out the decisions of the Security Council, and is a powerful person.

The Secretary-General is chosen for five years by the General Assembly. The present Secretary-General António Guterres assumed the post on 1 January 2017.

António Guterres, the current Secretary-General of the UN

Economic and Social Council (ECOSOC)

The Economic and Social Council (ECOSOC) works under the General Assembly. It looks after those programmes of the UN which provide help to developing nations. It also looks after the programmes related to education, health and culture. It looks after the work of several agencies that work for the poor and needy.

Special Agencies

Much of the work of the UN is carried out by specialised agencies. They deal with food aid, health, education, environment and agriculture. Member countries pay for the work of these agencies.

The richer a nation is, the more it pays. Let us look at the aims and programmes of some of these agencies.

United Nations Children's Fund (UNICEF)

UNICEF is responsible for the welfare of children all over the world. It conducts programmes, especially in developing countries, to ensure that the food, health, and educational needs of children are met.

United Nations Educational, Scientific and Cultural Organisation (UNESCO)

UNESCO was established by the UN in 1946. Its aim is to encourage nations to work together in the areas of education, science and culture. The UNESCO educates people about health and farming methods, spreading scientific knowledge, teacher-training, and cultural exchange of students and teachers between countries.

World Health Organisation (WHO)

WHO was established in 1948. Its aim is to improve the health of the people worldwide. It provides help and training for health workers to fight against diseases such as malaria, tuberculosis and AIDS. It promotes research in health and medicine. It also provides information about outbreaks of epidemics.

Inoculating a child against a disease

Food and Agricultural Organisation (FAO)

The main aim of FAO is 'freedom from hunger' for every human in the world. It helps nations to increase food production. It provides them with help in getting better seeds, controlling crop and animal diseases, improving irrigation, conserving soil and forests, etc. It warns

of food shortages and arranges food for people suffering during such times.

International Labour Organisation (ILO)

The aim of the ILO is to improve the working conditions and living standards of the working class.

Achievements of the UN

The United Nations has tried to prevent tension or war between countries. It has been largely successful in its efforts. Wars between India and Pakistan, Iran and Iraq, Israel and Palestine, North and South Korea and many others were not allowed to grow bigger mainly because of the efforts of the United Nations. The UN has also played an important part in arms control, especially in preventing the use of nuclear weapons.

The UN has been very successful in its fight against poverty, disease and illiteracy. It has also achieved success in improving cultural cooperation among countries.

However, people in the developing world feel that the UN does not understand the problems of the developing nations very well, and is therefore unable to solve their problems. It could not prevent the invasion of Iraq by American-led armed

American troops in Iraq

forces in 2003, nor put an end to the war in Darfur, Sudan.

Some people have also questioned the veto power enjoyed by the five permanent members of the UN.

India's Contribution to the United Nations

India has been a member of the United Nations since it was formed in 1945. It has always stood for peace, and played an important role in the UN's efforts for world peace. Some of the main achievements and efforts of India are as follows.

Indian members of the UN peacekeeping force in Ethiopia, Africa

- Indian armed forces have been used as **peacekeeping forces** in the Middle East, Cyprus, and the Democratic Republic of Congo and Sudan.
- India is not a permanent member of the UN Security Council. However, India has been elected several times for a seat in the Security Council, for example during 1984-85 and 1991-92.
- India played a prominent role in putting forward the concerns of developing countries at the United Nations.
- India actively opposed the policy of considering Blacks as inferior to Whites in South Africa. This policy was known as **apartheid**. Finally due to the pressures of the United Nations and countries like India, apartheid was abolished in South Africa. India established relations with South Africa only after this.
- Many Indians are working in the UN agencies. India has also received help from time to time from the agencies for its development programmes.

I now know

1. The United Nations was formed after the death and destruction caused by World War II, on 24 October 1945.
2. The main aims of the UN are to prevent war, to safeguard human rights, improve living standards, fight diseases and preserve the environment.
3. The six organs of the UN are the General Assembly, the Security Council, the Secretariat, the Economic and Social Council, the International Court of Justice, and the Trusteeship Council.
4. The Secretary-General is the highest official of the UN.
5. The work of the UN, other than maintaining world peace, is carried out by specialised agencies.
6. India has played a prominent role in the activities of the UN.

Words to remember

human rights: basic rights that all people are entitled to regardless of their nationality, sex, race, religion or language

veto power: is the power of a state to forbid or stop an official action, especially enactment of a law

apartheid: the policy of treating Blacks as people who are inferior to the Whites

specialised: developed or designed for a special activity or function

epidemic: an infectious disease that affects a large number of people within a community, population, or region

Exercises

A. Match the special agency of the UN with its aims.

1.	Welfare of children of the world	a. FAO
2.	Freedom from hunger	b. ILO
3.	Promotion of education, science and culture	c. UNICEF
4.	Improve conditions of the working class	d. WHO
5.	Improve health of people	e. UNESCO

B. Write T for true and F for false sentences.

1. The only aim of the UN is to prevent wars.
2. All nations are members of the Security Council.
3. The General Assembly is the most powerful organ of the UN.
4. There have been no wars between nations after the UN was formed.
5. India has never had a seat in the Security Council.

C. Answer the following questions.

1. Why was the United Nations formed?
2. Besides maintaining world peace, in what other ways does the UN help its member countries?
3. Name the six organs of the UN. Which organ is the most powerful?
4. Name the five permanent members of the Security Council.
5. Who is the head of the UN? List his or her main responsibilities.
6. What do you mean by 'specialised agencies' of the UN? Name any four agencies of the UN.
7. What is apartheid? Why did India oppose it?

Weblinks

www.un.org/en/aboutun/index.shtml
www.undp.org.in

HOTS: Think and Answer

- War has broken out between two nations, and the UN decides that one of them has wrongly attacked the other. What action can the Security Council take against the country that attacked first?
- The Indian cricket team has started playing against South Africa only a few years back. There were no matches between India and South Africa before that. What do you think is the reason for this?

Multiple choice questions

1. The set of rules according to which the UN is governed is called
   a. the Constitution of the United Nations b. the Government of the United Nations
   c. the Secretariat d. the Charter of the United Nations
2. Which of these is not an aim of the UN :
   a. to maintain international peace b. to encourage respect for human rights
   c. to help the less developed nations achieve progress
   d. to govern and rule newly formed nations
3. In the General Assembly,
   a. all countries have one vote
   b. countries with larger populations have more votes
   c. countries that are more developed have more votes
   d. the poorer countries have more votes
4. The most powerful organ of the UN is the
   a. the General Assembly b. the Security Council
   c. The International Court of Justice d. the Secretariat
5. The agency of the UN that is responsible for the welfare of children all over the world is the
   a. UNESCO b. UNICEF c. WHO d. ILO
6. Which country followed the policy of apartheid?
   a. the USA b. Britain c. South Africa d. Germany

Enrichment Activities

- **Speak out:** Has the UN really been able to bring peace to the world?
- **Find out:** The flag of the United Nations is given here. It consists of a map of the world surrounded by olive branches. Find out what the symbol on the flag means.

  Find out the name of the Indian who was considered for the post of Secretary General of the UN in 2006-07.

- **Art work:** Prepare a poster or collage that invites young men and women to join the UN Peacekeeping Force. Also write a catchy slogan.
- **Project work:** Work in groups. Each group can prepare a project report or create a website on any of the special agencies of the UN, like the UNESCO or the UNICEF. Focus especially on their activities in India.

Hands on!

Hold a Model United Nations Session in your class. Each child can represent a different nation. Have a discussion on the challenge posed by the issues of water scarcity and lack of access to sanitation in South and South-East Asia. Try to come up with solutions to the problems—how to ensure that enough water is being supplied to the growing population and that proper sanitation methods are put in place.

This picture shows a Model United Nations Session being conducted in Delhi Public School, Sharjah.

Life Skills and Values

The ability to debate, discuss and stay calm in a crisis

What qualities should a person have to become a country's representative to the United Nations? The person should be able to get his or her point across clearly, be able to negotiate or discuss issues, and be able to stay calm even in an emergency.

These are qualities that will help you in life, wherever you are, and whatever may be your job. Try and develop these skills.

18 The British Raj and the First War of Independence

Mind opener

Throughout history some countries have tried to rule over other countries. What do you think are the reasons for this?

Looking Ahead

In this lesson you will learn about:

- *The arrival of the Europeans in India*
- *The establishment of the British Empire in India*
- *The rising discontent among the Indians*
- *The Revolt of 1857*

European Traders

Several hundred years ago, the Arabs and the Europeans traded with India. They traded mainly over land. India at that time was a very rich country, famous for its spices, gold, pearls and silk. The first European to find a sea route to India was the Portuguese explorer **Vasco da Gama**. He travelled around Africa and landed at Calicut, in Kerala, a little over 500 years ago.

The Portuguese started trading with India, mainly in spices. They were followed by the Dutch, French and English traders. Soon, they started fighting against each other to get a bigger share of the trade for themselves.

Finally, the British defeated the others. The British formed the **English East**

Vasco da Gama's meeting with the Zamorin, the ruler of Calicut

India Company in the year 1600 for trading in India. They made trading centres in the western and eastern coasts. They bought mainly spices and textiles from India. For some time their main concern was only trading.

Did you know?

The Portuguese established trading centres along the west coast of India. These centres were called **factories**, because they were the places where **factors**, or officials of the company, bought and sold goods for the company. The factories were fortified, or made strong, to protect them from attack.

British Control

The wealth taken back to Britain by the traders of the East India Company was used to fund the **industrial revolution** in Britain. The British now needed a steady supply of raw materials for their factories. They also needed a market to sell the goods being made by the factories.

Soon the British were not content with being mere traders in India. They wanted to control the land. Around 250 years ago, the Mughal Empire in India had started declining. Several regional kingdoms emerged. The British took advantage of the constant fighting between them, and started gaining control over India. The first stage of the British conquest of India was marked by the **Battle of Plassey** in 1757. In

Mir Jafar with Robert Clive, the commander of the British Forces, after the Battle of Plassey

this battle, the British defeated Siraj-ud-Daulah, the Nawab of Bengal, and became very powerful in Bengal. Over the next 100 years they extended their control over most of India.

Discontent among Indians

Soon there was widespread discontent among the Indians. The officers of the East India Company used unfair means to get rich. They did so at the cost of the Indians. The farmers in India were forced to grow crops like indigo and cotton, which provided the British with raw materials for their factories. The British purchased these at very low prices. As a result, the farmers suffered. They became poorer, while the British made huge profits.

The mill cloth made by the British industries was sold in India. This was cheaper and of better quality than the cloth made by local weavers, so more

The first trading centre established by the British in India, at Surat, in 1613 (note how the settlement is fortified with strong walls)

and more people bought it. As a result of this, the Indian handloom industry suffered and the workers became poorer. Traders also suffered because of the goods coming from Britain.

The British made unjust laws through which they could take control of more and more kingdoms in India. One such law said that if a ruler died without a child, their kingdom would be taken over by the British. This made the Indian rulers very unhappy.

Many of the Indians—the farmers, workers, traders, and rulers—were angry and dissatisfied with the British rule. Whenever such a situation exists, there are chances of a **revolt** or an **uprising**. People forget their fears and differences, and together rise against the rulers. This is what happened in India in 1857. A small incident started a revolt that quickly spread through the population.

British traders in India

The Revolt of 1857—The First War of Independence

Before the revolt started, there were several months of tension among the Indian soldiers because of the new rifles they had to use. To load these rifles, the soldiers had to bite off the ends of greased cartridges. A rumour spread among the soldiers that the cartridges were greased with the fat of cows and pigs. The Hindus regard cows as sacred, and Muslims regard pigs as unclean. So the rumour angered both the Hindu and the Muslim soldiers.

On 29 March 1857, an Indian soldier **Mangal Pandey** attacked a British officer near Calcutta (now Kolkata). There was widespread discontent and anger among the Indian soldiers when Mangal Pandey was hanged on 8 April 1857. On 10 May 1857, Indian soldiers in Meerut shot down their officers and took over Meerut. Then they marched to Delhi and persuaded the last Mughal

Bahadur Shah Zafar

Tatya Tope

Nana Saheb

emperor **Bahadur Shah Zafar** to lead the revolt.

The Revolt spread rapidly to other parts of India. Different leaders led the revolt in different parts of India. Some of the prominent leaders were **Nana Saheb**, **Tatya Tope**, **Rani Lakshmi Bai** and **Begum Hazrat Mahal.** But the British had superior weapons and greater military strength. Many Indians also sided with the British. The Revolt of 1857, also known as the **First War of Independence**, was finally crushed by the British. However, the British were alarmed by the Revolt.

Rani Lakshmi Bai of Jhansi

In 1858, the British Government decided to take India under its direct control. The rule of the East India Company ended. A Viceroy was appointed to rule over India, on behalf of the Crown.

Though the Revolt failed, Indians were inspired by the bravery of those who fought against the British. It made them realise the injustice of the British rule, and the value of freedom. It made them aware that if they stood united, they could defeat the British and gain independence.

Words to remember

trade: the activity of buying and selling goods
textiles: cloth or fabric
handloom: a loom, or cloth weaving machine, that is operated by hand
revolt: an uprising of the people that attempts to overthrow the government

I now know

1. Vasco da Gama was the first European to find a sea route to India.
2. The British formed the East India Company in the year 1600 for trading in India.
3. Taking advantage of the constant fighting between different kingdoms in India, the British started taking control of India.
4. The British made unjust laws, and used unfair means to get rich, at the cost of the Indians.
5. This made the Indians angry and dissatisfied with the British rulers.
6. The Revolt of 1857, or the First War of Independence, was started in Meerut by the sepoys or Indian soldiers serving in the British army.
7. Bahadur Shah Zafar was made the leader of the revolt.
8. Nana Saheb, Tatya Tope, Rani Lakshmi Bai and Begum Hazrat Mahal were some prominent leaders who led the revolt in different territories.
9. The Revolt was crushed but it marked the beginning of the Indian freedom struggle.
10. In 1858, the British Government took direct control of India.

Exercises

A. Fill in the blanks.

1. The first European to find a sea route to India was _____ .
2. The British became very powerful in Bengal after the Battle of _____ in 1757.
3. The Revolt of 1857 started in the city of _____ .
4. _____ was declared the leader of the 1857 revolt.
5. The British _____ took over the control of India from the East India Company.

B. Write T for true and F for false sentences.

1. On his first trip to India, Vasco da Gama landed in the city of Calcutta.
2. The British bought cheap raw materials from Indians and sold them as finished goods at high prices.
3. India became independent from British rule after the rule of the East India Company ended.
4. The British were able to take control of India because the rulers were always fighting among themselves.
5. The Revolt of 1857 was the first war of independence fought by the Indians.

C. Answer the following questions.

1. Which European country was the first to start trade with India?
2. Name three other European countries that started trading with India.

3. Why did the countries trading with India fight among themselves? Who finally won the fight?
4. What gave the British an opportunity to start gaining control over India?
5. Explain why the Industrial Revolution in Britain was bad for the weavers in India.
6. Give one example of an unjust law made by the British to take over kingdoms in India.
7. Why were the Indian soldiers unhappy with the new rifles?
8. Why were the British able to crush the Revolt of 1857?

Multiple choice questions

1. Which of these countries traded with India about 500 years ago?
   a. Britain b. Portugal c. French d. all of these
2. One of the main items the European traders bought from India was:
   a. furniture b. jewellery c. spices d. arms
3. The Indian soldier who started the revolt against the British was
   a. Tatya Tope b. Nana Saheb c. Rani Lakshmi Bai d. Mangal Pandey
4. The Mughal Emperor who participated in the First War of Independence was
   a. Bahadur Shah Zafar b. Akbar c. Humayun d. Shah Jahan
5. Who did the British defeat in the Battle of Plassey?
   a. Tatya Tope b. Nana Saheb c. Rani Lakshmi Bai d. Siraj-ud-Daulah

Weblinks

http://www.gatewayforindia.com/history/british_history1.htm
http://oudh.tripod.com/1857/1857.htm - freedom fighters of 1857

HOTS: Think and Answer

- 'Even though the Revolt of 1857 did not succeed, it taught the Indians an important lesson.' Explain.

Enrichment Activities

- **Speak out:** Speak on the topic 'United we stand, divided we fall'. You could give examples from this chapter to prove your point.

- **Write right:** Imagine it is 1857, and you are a soldier in the British army. Create a pamphlet inviting other soldiers to join the revolt you and your friends are planning. It should list the reasons why you are revolting and what you are planning to do after the revolt.
- **Art work:** Paint a picture of the Revolt of 1857, or of any of the leaders of the Revolt.
- **Find out:** Find out the names of the leaders who led the revolt at the following places.

  1. Delhi 2. Kanpur 3. Lucknow 4. Gwalior 5. Jhansi
- **Role play:** Working in groups, write a play about Mangal Pandey and his role in the Revolt of 1857, and enact it in class.
- **Project work:** Do a project on any of the leaders of the Revolt of 1857. You could present it as a report or prepare a website.

Hands on!

On a map of the world, trace the route taken by Vasco da Gama to travel from Lisbon in Portugal to Calicut in India.

Life Skills and Values

Strength in Unity

The British started off as trading partners of India but were able to rule India because of the constant fighting between the different kingdoms in India. What important lesson for life does this give us?

If we work together, our strength increases. But if we fight among ourselves, we become weak. Others can then take advantage of us.

19 The Struggle for Independence

Mind opener

There were many Indians who did not want the British to leave India. Why do you think they felt this way? Do you agree with them? Have a discussion in class.

Looking Ahead

In this lesson you will learn about:

- *The role of the social reformers*
- *The rise of Indian Nationalism*
- *The partition of Bengal and the Swadeshi Movement*
- *Activities of the revolutionaries*
- *World War I and after*

Social Reformers

Even before the Revolt of 1857, there was a growing awareness among some educated Indians about the need to reform or change Indian society. Certain unwanted practices, such as the caste system, killing of female babies, sati and child marriage, were dividing Indian society and keeping it backward.

The educated Indians realised that removal of these outdated customs were necessary for the progress of Indian society. This could be done by educating the people. Several social reformers like **Raja Rammohun Roy**, **Ishwar Chandra Vidyasagar**, **Swami Dayanand Saraswati, Savitribai Phule** and **Sir Syed Ahmed Khan** fought against these unwanted practices.

Raja Rammohun Roy

Swami Dayanand Saraswati

Sir Syed Ahmed Khan

The Rise of Indian Nationalism

The Revolt of 1857 made the people of India realise the injustice of British rule, and the value of freedom. The people most affected by this thinking were the educated Indians. They became more and more dissatisfied with the British rule. Many of these people, and some Englishmen who supported them, came together in 1885 and formed the **Indian National Congress**.

The first session of the Indian National Congress was held in Bombay (now Mumbai). After that, it met in different cities every year. At first, the Indian National Congress did not raise the question of freedom from British rule. Their main demand was to bring reforms so that Indians could lead a more free and better life under the British. Some of the important leaders at this time were **Dadabhai Naoroji**, **Gopal Krishna Gokhale** and **Womesh Chandra Bonnerjee**. They were referred to as the **moderates**.

Members of the Indian National Congress at its first meeting in 1885

However, several other leaders were not in favour of such a 'soft' approach. They felt that they would gain nothing by following such an approach. They preferred a stronger and more active opposition to the British. They wanted **swaraj** or self-rule for the Indians. They were called the **radicals**.

Some of the important leaders of this group were **Lokmanya Tilak**, **Bipin Chandra Pal** and **Lala Lajpat Rai**. Tilak declared, 'Freedom is my birthright, and I shall have it.' He started a newspaper called ***Kesari*** in which he spoke out against the British. He wanted to arouse the feeling of patriotism in Indians.

Lokmanya Tilak

Lala Lajpat Rai

Dadabhai Naoroji

Gopal Krishna Gokhale

The Partition of Bengal and the Swadeshi Movement

The British were worried about the growing feeling of nationalism among the Indians. They realised that if the people of India got united, they could easily throw the British out. One of the ways in which they could prevent Indians from uniting was to divide them on the basis of religion. At that time, the feeling of nationalism was the strongest in Bengal. So, in 1905, they decided to **divide Bengal** into two parts—one for the Hindus and the other for the Muslims.

The Indians protested strongly against the division of Bengal. The anger in the people gave rise to the **Swadeshi Movement**. Swadeshi means 'own country'. People pledged to use goods made in their own country and boycotted British goods. Bonfires of British goods, especially clothes, were made at several places. Women and students also participated in the movement. It started in Bengal but soon spread to other parts of India.

The British tried to ruthlessly put down the movement. People were fined and mercilessly beaten. But ultimately, the opposition to the partition of Bengal was successful and the British were forced to reunite it.

Activities of the Revolutionaries

After the partition of Bengal, several young Indians started using more violent means to fight the British. They formed groups to fight the British, and were willing to sacrifice their lives for the country. They were called the **revolutionaries**. The movement spread to many states of India.

Important revolutionaries were Aurobindo Ghosh, Barun Ghosh, Khudiram Bose, Chandrashekhar Azad, Bhagat Singh, Sukhdev, Raj Guru and Udham Singh.

Bhagat Singh

The movement, however, was not very successful. Since the revolutionaries resorted to violent means of protest, they were not joined by the general masses.

Mahatma Gandhi comes back to India in 1915

World War I and After

World War I broke out in 1914. Lakhs of Indian soldiers fought with the British army. Thousands were killed. Indians thought that the British would be more sympathetic towards them after the war. However, this did not happen. The British became even harsher towards Indians. They imposed fresh taxes to recover the losses they suffered in the war.

You already know that Mahatma Gandhi came back to India from South Africa in 1915 while World War I was still going on. Soon he took over the leadership of the Independence movement going on in India.

I now know

1. Social reformers fought against the evils that divided the Indian society and made it backward.
2. The Indian National Congress was formed in 1885 by people who were dissatisfied with the British rule in India.
3. The Indian National Congress initially demanded reforms for Indians under the British rule.
4. Many members of the Congress did not like the soft approach of the leaders and wanted swaraj or self-rule.
5. To weaken the feeling of nationalism among Indians, the British tried to divide them on the basis of religion.
6. The protests against the British division of Bengal led to the Swadeshi Movement.
7. The revolutionaries believed in fighting the British with arms.
8. The British became harsher towards the Indians after World War I.

Words to remember

social: related to society and to people's lives
reformer: someone who wants to change and improve something
nationalism: love of and pride in one's own country
patriotism: strong feeling of love, respect and loyalty towards one's country

Exercises

A. Fill in the blanks.

1. Social _____ fought against the evils in Indian society.
2. The first session of the Indian National Congress was held in _____ .
3. The Congress leaders who preferred a soft persuasive approach towards the British were known as _____ .

Exercises

4. Indians who thought that the British should be driven out with the help of arms were known as _____ .
5. Lokmanya Tilak started the newspaper _____ .
6. During the _____ Movement people burnt British goods.

B. Name the following.

1. Two social reformers: _____ _____
2. Two 'moderate' leaders in the Indian National Congress: _____
3. Two leaders in the Indian National Congress who wanted to take a stronger approach to the British: _____
4. Two revolutionaries: _____

C. Answer the following questions.

1. According to the social reformers, why was Indian society divided and backward?
2. Why did the reformers want to educate the people of India?
3. How did the thinking of the educated people in India change after the First War of Independence?
4. What was the difference between the 'moderates' and the 'radicals'?
5. Who said 'Freedom is my birthright, and I shall have it'?
6. Why did the British think of partitioning Bengal?
7. What was the Swadeshi Movement?
8. Why did the British impose more taxes on the people after World War I?

HOTS: Think and Answer

- During the Swadeshi Movement people boycotted British goods. Do you think we should do the same today and boycott all foreign goods? (Hint: At that time India made very few products. Today we make many products and sell them to different countries)

Enrichment Activities

- **Write right:** Write a paragraph or two on the life of the freedom fighter you admire the most.
- **Group project:** Make a project file or a website on the leaders of the Indian National Congress or the revolutionaries and their activities.
- **Speak out:** Imagine that you are Lokmanya Tilak. Give a speech urging the people of India to rise against the British and to fight for their freedom.

Multiple choice questions

1. Who among these were social reformers?
   a. Sir Syed Ahmed Khan b. Swami Dayanand Saraswati
   c. Raja Rammohun Roy d. all of these
2. Who among these was not a 'moderate'?
   a. Dadabhai Naoroji b. Lokmanya Tilak
   c. Gopal Krishna Gokhle d. W C Bonnerjee
3. Who said these words— 'Freedom is my birthright and I shall have it'?
   a. Lala Lajpat Rai b. Lokmanya Tilak
   c. Gopal Krishna Gokhle d. Bipin Chandra Pal
4. The British efforts at partitioning Bengal gave rise to:
   a. Formation of Indian National Congress b. World War I
   c. Swadeshi Movement d. Revolutionary Movement
5. Mahatma Gandhi came back to India from South Africa
   a. in 1905 when the British decided to divide Bengal
   b. in 1914 when World War I broke out
   c. in 1857 when the First War of Independence started
   d. in 1915 while World War I was going on

Hands on!

Let us Act

Watch a few movies like **Bhagat Singh** and **Mangal Pandey**, made on India's struggle for independence. Now form groups of 10 or 12. Write a script for a play based on the life of a freedom fighter. Enact it in class.

Life Skills and Values

Respecting diversity

People are different from each other. They have different ways of thinking and doing things. If everyone was forced to think in the same way and do things in the same way, the world would be a very difficult place to live in! For example, if everyone ate the same kind of food, we would no longer be able to enjoy the fun of eating different kinds of food.

We should learn to respect everyone—however different be their food habits, clothes or religious beliefs.

20 Gandhiji Leads The Nation

Mind opener

A person is troubling you. You want them to stop. You can either pick a fight with them and try to force them to stop, or you can be calm and try to explain the wrong-doing on their part. Which one do you think is more effective?

Looking Ahead

In this lesson you will learn about:

- *Gandhiji's contribution to the freedom struggle*
- *The Rowlatt Acts and the Jallianwala Bagh Massacre*
- *The Non-Cooperation Movement and the Civil Disobedience Movement*
- *The Simon Commission and the Demand for Purna Swaraj*
- *World War II and the Quit India Movement*
- *Subhas Chandra Bose and the Indian National Army*
- *How India finally became free*

After returning to India in 1915, Gandhiji travelled to various parts of the country. He wanted to know more about the people. He was shocked by what he saw. Most people were very poor. Social evils like the caste system kept the people divided and backward. Gandhiji was very sad to see that some groups of people were considered 'untouchables' and were treated very badly. Gandhiji believed that India would be fit for freedom only when Indians treated each other as equals and with respect.

He started working towards this aim. He travelled around the country speaking out against the practice of 'untouchability'. He quickly won the support and respect of the common people of India.

People gather on the banks of the Sabarmati River to hear Gandhiji speak; Gandhiji was loved by the masses

The Rowlatt Acts and the Jallianwala Bagh Massacre

You have read that after World War I ended, the British became harsher towards Indians. They imposed fresh taxes and passed new laws to suppress Indians. This was the time when Gandhiji launched his **Satyagraha Movement** in India. Satyagraha, as you know, is a non-violent method of protest against any form of injustice. In 1919, the British passed new laws called the **Rowlatt Acts**. Under these laws they could arrest anyone without a trial.

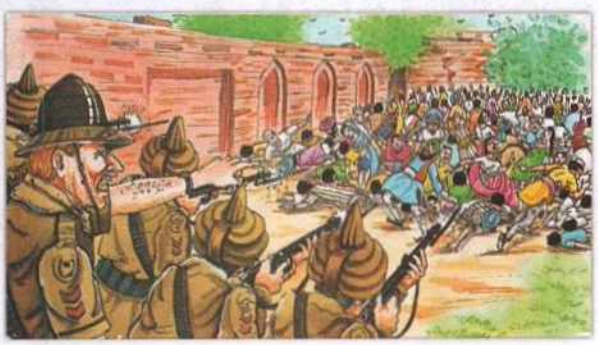
Gandhiji asked the people to oppose the laws. Demonstrations and meetings were held all over the country. Gandhiji's Satyagraha Movement now had millions of followers. On 13 April 1919, a public meeting was held in Jallianwala Bagh in Amritsar. It was attended by about 10,000 men, women and children. On the orders of General Dyer, the British soldiers blocked the only exit from the park, and fired for 10 minutes into the unarmed crowd. Thousands were killed or injured.

The incident shocked the entire country and also some British. Dyer was forced to resign in March 1920. In July 1920, however, the House of Lords in Britain pardoned Dyer.

The Non-Cooperation Movement

The shootings and the British government's attitude convinced Gandhiji and the people of India that India must become independent.

Gandhiji now launched the Non-Cooperation Movement. He asked the people of India not to cooperate with the British. Indians working for the British Government resigned, lawyers boycotted the courts, and Indian children were withdrawn from British government schools. Throughout the country, men, women and children sat on the streets and blocked them. They refused to rise even when beaten by the police.



General Dyer ordering the massacre at Jallianwala Bagh

Peaceful protestors being beaten up by British troops during the Non-Cooperation Movement

Gandhiji was arrested, but the British were soon forced to release him. In 1922, the people participating in the Non-Cooperation Movement in Chauri Chaura in Uttar Pradesh became violent. They set fire to a police station, killing twenty-two policemen. Gandhiji considered this as a failure of the Movement, and called it off. He firmly believed that the Movement could only succeed if it was non-violent. He was arrested by the British and put in prison.

During the Non-Cooperation Movement many young leaders joined the freedom struggle. Among them were **Pandit Jawaharlal Nehru**, **Netaji Subhas Chandra Bose** and **Maulana Abul Kalam Azad**.

Pandit Jawaharlal Nehru with Gandhiji

Did you know?

Udham Singh, a revolutionary, shot Sir Michael O'Dwyer, believing him to be the main person behind the Jallianwala Bagh massacre on 13 March 1940, in London. General Dyer who had actually carried out the massacre died earlier in 1927.

Maulana Abul Kalam Azad

Netaji Subhas Chandra Bose

The Civil Disobedience Movement

In 1930, Gandhiji launched a massive Civil Disobedience Movement. He called on Indians to refuse to pay taxes, especially the tax on salt, to the British Government. The 'Salt Law' passed by the British forbade Indians from making salt. Gandhiji decided to start the Civil Disobedience Movement by breaking this unjust law. He organised a peaceful march from the Sabarmati Ashram

Gandhiji leading the Dandi March

Gandhiji picking up a handful of salt to break the Salt Law

in Ahmedabad to Dandi on the sea shore. A large number of people took part in this march, known as the **Dandi March**.

At Dandi, Gandhiji and his followers made salt by evaporating sea water. Gandhiji was arrested, but the Civil Disobedience Movement spread throughout India.

The Simon Commission and the Demand for Purna Swaraj

The British wanted to make some changes in the way India was governed. In 1928, a committee under Sir Simon, called **Simon Commission**, began working on this. There was no Indian in the Commission. This angered the Indians. They decided to boycott the Commission. They staged demonstrations and shouted the slogan 'Simon go back'.

The Congress now decided to demand **Purna Swaraj** or complete independence for India.

World War II and the Quit India Movement

The British arrested tens of thousands

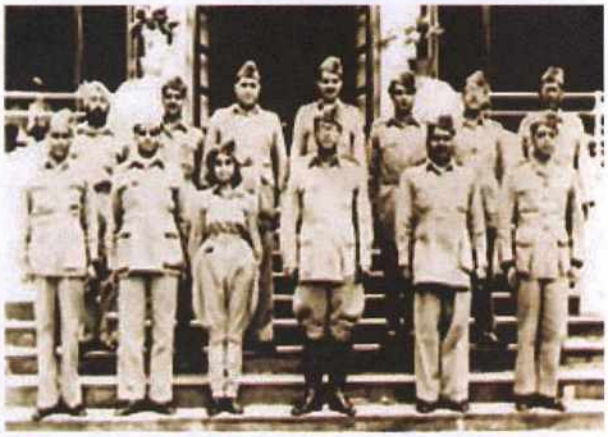
Quit India Movement

of people, but could not crush the Movement. Finally, they were forced to introduce reforms. In 1935, they passed the **Government of India Act**. Elections were held throughout the country. The Congress won in most provinces and formed governments. But power still remained in the hands of the British.

World War II broke out in 1939. The British declared war on India's behalf, without talking to the Indian leaders. In protest, the Congress ministries in the provinces resigned. The Congress declared that India would not join the war until the British granted complete independence. They held talks with the British. But the talks failed, and the Congress under the leadership of Gandhiji, launched the **Quit India Movement** in August 1942. Gandhiji and other leaders were arrested. There were violent protests all over the country.

Netaji Subhas Chandra Bose and the Indian National Army

Subhas Chandra Bose had been



Subhas Chandra Bose with members of the INA

Jawaharlal Nehru being sworn in as the first Prime Minister of independent India

elected President of the Indian National Congress twice. He was lovingly called 'Netaji'. He was convinced that the British would never leave India peacefully. He went to Japan from where he organised an army of 40,000 Indian soldiers. He called it the **Azad Hind Fauj** or the **Indian National Army**.

The Indian National Army (INA) fought against the British on the north-east borders of India. Though the INA could not win the war, their struggle helped strengthen the freedom struggle.

India Becomes Free

By the time World War II ended in 1945, the British realised that they could no longer keep the Indians in their control. The Quit India Movement and the Indian National Army had shaken them. They agreed to move out of India and started discussions with the Congress and the Muslim League.

The 'divide and rule' policy of the British had been successful in dividing the Hindus and Muslims. The Muslim League, under the leadership of Mohammad Ali Jinnah, demanded a separate nation for the Muslims. Gandhiji was against the division of India.

India got its independence on 15 August 1947, but was divided into two nations—**India** and **Pakistan**. Gandhiji's dream of a united India had been shattered.

Words to remember

non-cooperation: a type of protest where you refuse to do things that someone wants you to do

committee: a group of people chosen to do a particular job

boycott: not to do or buy something to show protest

I now know

1. After coming back to India, Gandhiji worked to remove evil practices from Indian society and to unite Indians against the British.
2. Gandhiji launched a movement to oppose the Rowlatt Acts in 1919.
3. The same year the British massacred thousands of unarmed people in Jallianwala Bagh in Amritsar.
4. After this, Gandhiji launched the Non-Cooperation Movement, but he stopped it after it turned violent.
5. Protests against the Simon Commission in 1928 again brought the people together against the British.
6. In 1929, Congress declared their demand for Purna Swaraj.
7. In 1930, Gandhiji launched the Civil Disobedience Movement with the Dandi March.
8. The Quit India Movement was launched in 1942.
9. The Indian National Army of Subhas Chandra Bose fought the British on the north-east borders of India, but was finally defeated.
10. After World War II, the British Government decided to free India.
11. India got its independence on 15 August 1947, but was divided into two nations—India and Pakistan.

Exercises

A. Fill in the blanks.

1. Gandhiji launched the Satyagraha Movement in India to oppose the _____ Acts.
2. The British, under General Dyer, massacred thousands of unarmed Indians gathered at _____ in Amritsar.
3. Indians protested against the _____ Commission as there was no Indian in it.
4. In the 1929 session of the Congress, the Congress demanded _____ from the British.
5. The Civil Disobedience Movement was launched with the _____ .
6. The _____ Movement was launched while World War II was going on.
7. The Indian National Army was formed by _____ .

B. Answer the following questions.

1. What did Gandhiji do as soon as he came back to India?
2. Why did Gandhiji protest against the Rowlatt Acts?
3. After which incident did Gandhiji launch the Non-Cooperation Movement?

4. Why did Gandhiji call off the Non-Cooperation Movement?
5. When did the Congress demand Purna Swaraj? What did this mean?
6. What was the Civil Disobedience Movement? How did it start?
7. What did the Civil Disobedience Movement achieve?
8. Why did the Congress ministries in the provinces resign after World War II started?
9. What role did Netaji Subhas Chandra Bose play in the freedom struggle?
10. 'India became independent but Gandhiji's dream was shattered.' Why?

C. Match the incidents with the years in which they happened.

1. Simon Commission	a. 1919
2. Jallianwala Bagh massacre	b. 13 April 1919
3. Rowlatt Acts	c. 1928
4. Civil Disobedience Movement	d. 1929
5. Government of India Act	e. 1930
6. Quit India Movement	f. 1935
7. World War II ends	g. 1942
8. India gets Independence	h. 1945
9. Purna Swaraj	i. 1947

Multiple choice questions

1. Satyagraha means
   a. speaking the truth
   b. violent protest against an injustice
   c. non-violent protest against an injustice
   d. any kind of protest against an injustice
2. To protest against which of these did Gandhiji undertake the Dandi March?
   a. Salt laws b. Rowlatt Acts c. Simon Commission d. Jallianwala Bagh massacre
3. The Quit India Movement was launched in
   a. 1928 when the Simon Commission started its work
   b. 1929 after the Congress decided to demand Purna Swaraj
   c. 1935 after the Government of India Act was passed
   d. 1942 after the failure of talks between the Congress and the British during World War II
4. Which of these leaders was in favour of the partition of India into two nations?
   a. Gandhiji b. Mohammad Ali Jinnah c. Subhas Chandra Bose
   d. None of these

Weblinks

http://kids.superindian.com/ . Click on 'India's freedom Struggle' under 'Indian History'
http://india.gov.in/knowindia/history_freedom_struggle.php

HOTS: Think and Answer

- Indians helped the British in World War I but not in World War II. Why?
- Was the Jallianwala Bagh massacre an act of bravery or cowardice on the part of the British?
  (Hint: They fired on unarmed people.)

Enrichment Activities

- **Speak out:** Have a debate on the topic: 'Peaceful revolts are more effective than violent revolts'.
- **Write right:** Write a paragraph on the topic 'What freedom means to me'. For each person the meaning of the word 'freedom' is different. For one person it might mean not having to attend office, for you it might mean having no one tell you to study, for someone else it might mean being able to express his or her thoughts openly.
- **Find out:** Find out about the recent peaceful Jasmine Movements in several countries in the Middle East. How were these similar to Gandhiji's Movement against the British?
- **Art work:** Draw and paint a picture of Gandhiji. Or you could make a poster or collage on the life and achievements of Gandhiji.
- **Project work:** Do a project on Gandhiji's life.

Hands on!

The next time you have a disagreement with someone, and you want to get into a fight—stop and try out Gandhiji's non-violent method. See if you can make it succeed.

Life Skills and Values

Controlling anger

Sometimes we get so angry that we lose control over ourselves. In this state we say things that hurt others, and which we regret later. This can often affect our relationship with our family and friends. Being able to control our anger is an important life skill.

Here are some tips to controlling your anger.

- If you feel your temper rising, do not say anything for some time. Take a deep breath and slowly count till ten. This will help you cool down.
- If this does not help, walk away instead of saying anything. Let your temper subside. Express your opinions after you have calmed down. Chances are that you will then not say rash things which you will regret later.
- Think carefully before you say anything. Otherwise, you're likely to say something you'll regret.

21 Our Government

Mind opener

The government lays down rules and makes laws. It also ensures that we live according to the laws and that we follow all the rules. But why do we need such a government? Wouldn't our lives be freer and happier without one? Discuss.

Looking Ahead

In this lesson you will learn about:

- *The different levels of government in our country*
- *The functions of the Central Government and its constitution*
- *The functions of the State Government and its structure*
- *The Supreme and High Courts*

The Three Levels of Government

India is a huge country. It is not possible for a single government to look after the entire country properly. So, the Indian government works at different levels—at the **local level**, at the **level of the state** and at the **national level.**

The local level refers to your village, town or locality. The state level covers an entire state, like Punjab, Kerala, Bihar, etc. The national level refers to the entire country. When the government works at different levels, it brings the government closer to the people.

Thus, our government consists of:

- A **Central** or **Union Government** for the entire country; it is based in the capital Delhi
- **State Governments** for the different states; they are based in the state capitals
- **Local Government** for the governance of the immediate community; urban areas are governed by **municipal**

Sansad Bhavan or the Parliament House, New Delhi

corporations or **municipal councils** and rural areas are governed by **Panchayati Raj** institutions such as the **Zilla Parishad** and **Gram Panchayat**

Relationship between the Centre and the States

The responsibility of governing the country is divided between the Centre and the State Governments. Certain responsibilities concern the country as a whole—for example the defence of our borders, or our relationship with other countries. These are the responsibilities of the Central Government.

Educating the people and looking after law and order in the different states are the responsibilities of the State Governments. The Central Government provides help to the State Governments whenever required.

The relationship between the different levels of government, and the responsibilities of each, are clearly laid out in our **Constitution**. The Constitution, as you learnt last year, is a set of rules according to which our country is run.

The Central Government

Making laws for the country, and seeing that they are implemented, is the main responsibility of the Central Government. The main law making body of the country is the **Parliament**. The Parliament consists of two houses, the **Lok Sabha** and the **Rajya Sabha**, and the **President**.

The Lok Sabha

The Lok Sabha is the lower House of the Parliament. The members of the Lok Sabha are directly elected by the people, for a period of five years. It is therefore called the **House of the People**. The **Speaker** ensures the smooth proceedings of the House.

Any citizen of India, above 25 years of age, can contest elections for the Lok Sabha. Citizens of India above 18 years of age can vote in the General Elections to elect the members of the Lok Sabha.

To ensure that the elections are fair, the country has been divided into **constituencies**. The constituencies vary in size, but all have roughly the same population. There are, at present, 543 constituencies.

Candidates from several political parties stand for election from each constituency. The candidate who gets most votes is declared elected from that constituency.

The 17th Lok Sabha, which was formed after the General Election in 2019, has 545 members. The Lok Sabha can have a maximum strength of 552 members, of which 530 members represent the states, 20 members