

Foreword

It gives me immense pleasure to place the textbook of Geography entitled, “The Earth Our Habitat” for Class VI in the hands of the budding scholars. The Jammu and Kashmir State Board of School Education (BOSE) has initiated the review, revision & construction process of school textbooks in the light of guidelines of National Curriculum Framework(NCF) – 2005. Every care has been taken to contextualize the hackneyed and outdated means of presentation of contents. Innovation brought in the presentation of contents will help in bringing about the creativity among the pupil. How far the present textbook meets the demand of the students, only stake holders can say?

It has been the policy of this Board to minimise the contents of the text book without compromising on the quality of the contents. The contents of this textbook have been presented in a play way manner because the subject has become a monster which students try to escape and thereby deprive them of the joy of learning and endanger their interest in the whole of the schooling.

However, the desired result will be achieved only when the pedagogy is tailored to the requirements of the contents and the situation wherein a pupil finds herself/ himself glowing hope that stakeholders will share the opinion with us with regard to the presentation of contents of this book. I assure them that whatever sound suggestions come forward will be given due weightage and consideration. The success of this effort depends on the steps that school principals and teachers will take to encourage children to reflect on their own learning and to pursue imaginative activities and questions. We must recognise that given space-time and freedom, children generate new knowledge by engaging with the information passed on to them by adults. Inculcating creativity and initiative is possible if we perceive and treat children as participants in learning, not as receivers of fixed body of knowledge.

I place on record my appreciation for CDR and Academic Division particularly Dr. Sheikh Bashir Ahmad, Director (Academics) and his team, Mr. M.D. Zargar, Dy. Director (Academics) Kashmir Division, Mr. Mushtaq Ahmad Bandy Academic Officer (Social Sciences and Humanities) for their efforts in bringing out this book.

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Prof. Desh Bandu Gupta
Chairman

Acknowledgement

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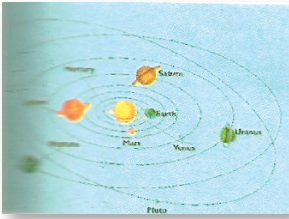
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Chapter 1



THE EARTH – In The Solar System

How wonderful it is to watch the sky after sunset! One would first notice one or two bright dots shining in the sky. Soon you would see the number increasing. You cannot count them any more. The whole sky is filled with tiny shining objects – some are bright, others dim. It seems as if the sky is studded with diamonds. They all appear to be twinkling. But if you look at them carefully you will notice that some of them do not twinkle as others do. They simply glow without any flicker just as the moon shines.

Along with these bright objects, you may also see the moon on most of the days. It may, however, appear at different times, in different shapes and at different positions. You can see the full moon only once in about a month's time. It is **Full moon** night or Poornima. A fortnight later, you cannot see it at all. It is a **New moon** night or Amavasya. On this day, you can watch the night sky best, provided it is a clear night.

Do you wonder why can't we see the moon and all those bright tiny objects during day time? It is because the very bright light of the sun does not allow us to see all these bright objects on the night sky.

The sun, the moon and all those objects shining in the sky are called **celestial bodies**.

Some celestial bodies are very big and hot. They are made up of gases. They have their own heat and light, which they emit in large amounts. These celestial bodies are called **stars**. The sun is a star.



Let's Do

You'll need: 1 torch, 1 sheet of plain paper, pencil and a needle.

Step:

1. Place the torch in the centre of the paper with its glass front touching the paper.
2. Now draw a circle around the torch.
3. Perforate the paper with the needle within the circled area.
4. Now place the perforated circle part of the paper on the glass front and wrap the paper around the torch with a rubber band.
5. Take care that the switch of the torch is not covered.
6. In a dark room, stand at some distance facing a plain wall. Switch off all other lights. Now flash the torch light on the wall. You will see numerous dots of light on the wall, like stars shine in the night.
7. Switch on all the lights in the room. All dots of light will be almost invisible.
8. You may now compare the situation with what happens to the bright objects of the night sky after the sun rises in the morning.



Figure 1.1: Saptarishi and the North Star

Countless twinkling stars in the night sky are similar to the sun. But we do not feel their heat or light, and they look so tiny because they are very very far from us.

You must have noticed that all objects look smaller when seen from a distance. How small an aeroplane looks when it is flying at a great height!

While watching the night sky, you may notice various patterns formed by different groups of stars. These are called **constellations**. Ursa Major or Big Bear is one such constellation. One of the most easily recognisable constellation is the small bear or Saptarishi (Sapta-seven, rishi-sages). It is a group of seven stars (Figure 1.1.) that forms a part of the large Ursa Major Constellation. Ask someone elder in your family or neighbourhood to show you more stars, planets and constellations in the sky.

In ancient times, people used to determine directions during the night with the help of

stars. The North star indicates the north direction. It is also called the **Pole Star**. It always remains in the same position in the sky. We can locate the position of the Pole Star with the help of the Saptarishi. Look at Figure 1.1, you will notice that, if an imaginary line is drawn joining the pointer stars and extended further, it will point to the Pole Star.

Some celestial bodies do not have their own heat and light. They are lit by the light of the stars. Such bodies are called **planets**. The word 'planet' comes from the Greek word "Planetai" which means 'wanderers'. The earth on which we live is a planet. It gets all its heat and light from the sun, which is our nearest star. If we look at the earth from a great distance, say the moon, it will appear to be shining just as the moon. The moon that we see in the sky is a satellite. It is a companion of our earth and moves round it. Like our earth, there are seven other planets that get heat and light from the sun. Some of them have their moons too.

Interesting Fact

Jupiter, Saturn and Uranus have rings around them. These are belts of small debris. These rings may be seen from the earth with the help of powerful telescopes.

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THE SOLAR SYSTEM

The sun, eight planets, satellites and some other celestial bodies known as asteroids and meteoroids form the solar system. We often call it a solar family with the sun as its Head.

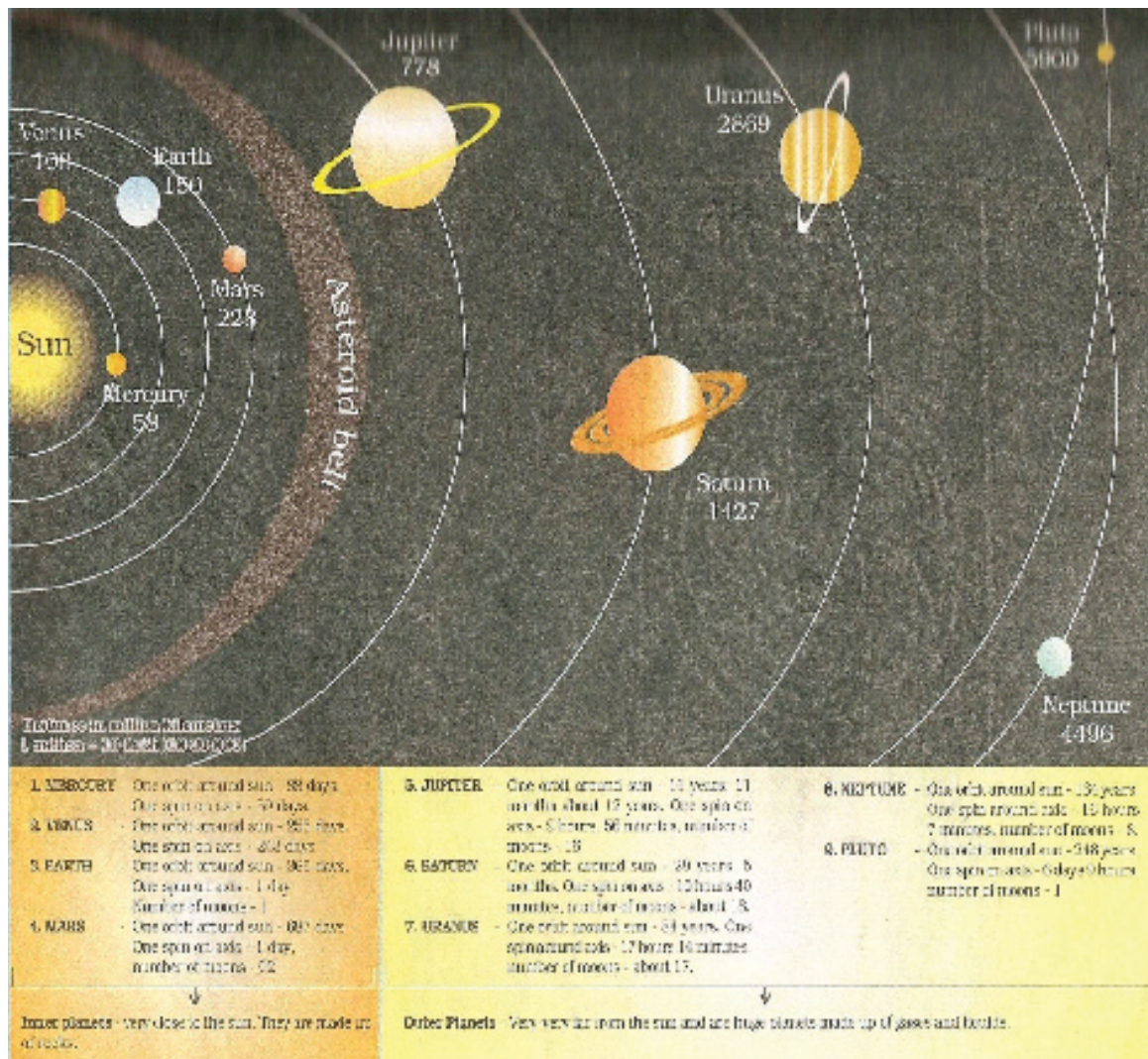


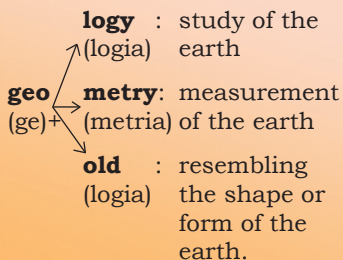
Figure 1.2: The Solar system

Do you know?

'Sol' in Roman mythology is the 'Sungod', 'Solar' means 'related to the sun'. The family of the sun is, therefore, called the solar system. Write down as many words using the word solar.

Word Origin

Many words used in a language may have been taken from some other language. Geography, for example, is an English word. It has its origin in Greek, which relates to description of the earth. It is made of two Greek words, 'ge' meaning 'earth' and 'graphia' meaning 'writing'. Find out more about the earth.



THE SUN

The sun is in the centre of the solar system. It is huge and made up of extremely hot gases. It provides the pulling force that binds the solar system. The sun is the ultimate source of heat and light for the solar system. But that tremendous heat is not felt so much by us because despite being our nearest star, it is far away from us. The sun is about 150 million km away from the earth.

PLANETS

There are eight planets in our solar system. In order of their distance from the sun, they are: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

There are four Dwarf Planets also they are Pluto, Charon, Eris & Ceres. [Now Pluto is not a planet remember it is a dwarf planet.]

All the eight planets of the solar system move around the sun in fixed paths. These paths are elongated. They are called orbits. Mercury is nearest to the sun. It takes only about 88 days to complete one round along its orbit. Pluto is supposed to be farthest till now. So it takes about 248 years to complete one round. Venus is considered as 'Earth's-twin' because its size and shape are very much similar to that of earth.

Do you know?

Humans have always been fascinated gazing at the night sky. Those who study the celestial bodies and their movements are called astronomers. Indian Mathematician and Astronomer Aryabhata was a famous astronomer of ancient India. Today, astronomers all over the world are busy exploring the universe.

THE EARTH

The earth is the third nearest planet to the Sun. In size, it is the fifth largest planet. It is slightly flattened at the poles. That is why, its shape is described as a **Geoid**. Geoid means an earth-like shape.

Conditions favourable to support life are probably found only on the earth. The earth is neither too hot nor too cold. It has water and air, which are very essential for our survival. The air has life-supporting gases like

oxygen. Because of these reasons, the earth is a unique planet in the solar system.

From the outer space, the earth appears blue because its two-thirds surface is covered by water. It is, therefore, called a blue planet.

THE MOON

Our earth has only one satellite. That is, the moon. Its diameter is only one-quarter that of the earth. It



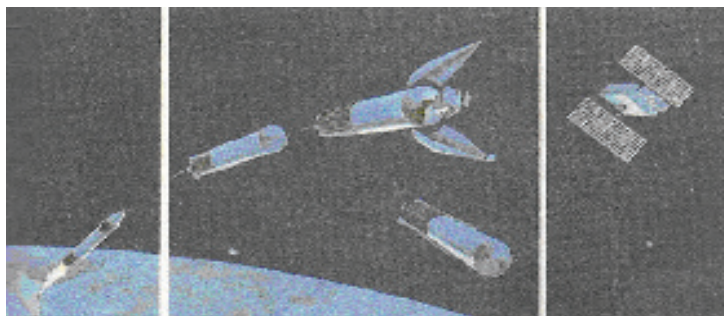
Figure 1.3: The moon as seen from the space

appears so big because it is nearer to our planet than other celestial bodies. It is about 3,84,400 km away from us. Now you can compare the distance of the earth from the sun and that from the moon.

The moon moves around the earth in about 27 days. It takes exactly the same time to complete one spin. As a

result, only one side of the moon is visible to us on the earth.

The moon does not have conditions favourable for life. It has neither water nor air. It has mountains, plains and depressions on its surface. These cast shadows on the moon's surface. Look at the full moon and observe these shadow.



Rocket launch Rocket fails back to the Earth Satellite enters orbit

Figure 1.4: Human-made Satellite

Do you know?

Light travels at the speed of about 300,000 km per second. Yet, even with this speed, the light of the sun takes about eight minutes to reach the earth.

Interesting Fact

Neil Armstrong was the first man to step on the surface of the moon on 29 July 1969. Find out whether any Indian has landed on the moon?

Satellite is a celestial body that moves around the planets in the same way as the planets move around the sun.

Human-made Satellite is an artificial body. It is designed by scientists to gather information about the universe or for communication. It is carried by a rocket and placed in the orbit around the earth.

Some of the Indian satellites are INSAT, IRS, EDUSAT, etc.

? What do animals and plants require in order to grow and survive?

ASTEROIDS

Apart from the stars, planets and satellites, there are numerous tiny bodies which also move around the sun. These bodies are called **asteroids**. They are found between the orbits of Mars and Jupiter (Figure 1.5). The largest asteroid is the Ceres. Scientists are of the view that asteroids are parts of a planet which exploded many years back.



Figure 1.5: Asteroids

METEOROIDS

The small pieces of rocks which move around the sun are called **meteoroids**. Sometimes these meteoroids come near the earth and tend to drop upon it. During this process due to friction with the air they get heated up and burn. It causes a flash of light. Sometimes, a meteor without being completely burnt, falls on the earth and creates a hollow.



Figure 1.6: Milky Way

Do you see a whitish broad band, like a white flowing path across the sky on a clear starry night? It is a cluster of millions of stars. This band is the *Milky Way galaxy* (Figure 1.6). Our solar system is a part of this galaxy. In ancient India, it was imagined to be a river of light flowing in the sky. Thus, it was named *Akash Ganga*. A **galaxy** is a huge system of billions of stars, and

clouds of dust and gases. There are millions of such galaxies that make the **Universe**. It is difficult to imagine how big the universe is. Scientists are still trying to find out more and more about it. We are not certain about its size but we know that all of us – you, I belong to this universe.



Can you relate yourself with the universe now? You are on the earth and the earth is a part of the solar system. Our solar system is a part of the Milky Way galaxy which is part of the universe. Think about the universe, and the fact that it contains millions of such galaxies. How do you fit in the picture.



EXERCISES

1. Answer the following questions briefly.

- (a) How does a planet differ from a star?
- (b) What is meant by the 'Solar Sytem'?
- (c) Name all the planets according to their distance from the sun.
- (d) Why is the Earth called a unique planet?
- (e) Why do we see only one side of the moon always?
- (f) What is the Universe?

2. Tick the correct answers

- (a) The planet known as the "Earth's Twin" is
 - (i) Jupiter (ii) Saturn (iii) Venus
- (b) Which is the third nearest planet to the sun
 - (i) Venus (ii) Earth (iii) Mercury
- (c) All the planets move around the sun in an
 - (i) Circular path (ii) Rectangular path (iii) Elliptical path
- (d) The Pole Star indicates the direction to the
 - (i) South (ii) North (iii) East
- (e) Asteroids are found between the orbits of
 - (i) Saturn and Jupiter
 - (ii) Mars and Jupiter
 - (iii) The Earth and Mars

3. Fill in the blanks

- (1) A group of _____ forming various patterns is called a _____.

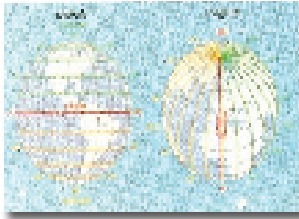
- (2) A huge system of stars is called _____.
- (3) _____ is the closest celestial body to our earth.
- (4) _____ is the third nearest planet to the sun.
- (5) Planets do not have their own _____ and _____.



Things to do

1. Prepare a chart of the solar system.
2. During a vacation visit a planetarium and describe your experience in the class.
3. Organise a quiz contest on the earth and the solar system.

Chapter 2



GLOBE – Latitudes and Longitudes

In the previous chapter, you have read that our planet earth is not a sphere. It is slightly flattened at the North and the South Poles and bulge in the middle. Can you imagine how it looks? You may look at a globe carefully in your classroom to get an idea. **Globe** is a true model (miniature form) of the earth [Figure 2.1].



Figure 2.1: Globe

Globes may be of varying size and type – big ones, which cannot be carried easily, small pocket globes, and globe-like balloons, which can be inflated and are handy and carried with ease. The globe is not fixed. It can be rotated the same way as a top spin or a potter's wheel is rotated. On the globe, countries, continents and oceans are shown in their correct size

It is difficult to describe the location of a point on a sphere like the earth. Now the question arises as to how to locate a place on it? We need certain points of reference and lines to find out the location of places.

You will notice that a needle is fixed through the globe in a tilted manner, which is called its **axis**. Two points on the globe through which the needle passes are two poles – North Pole and South Pole. The globe can be moved around this needle from west to east just as the earth moves. But, remember there is a major difference. The real earth has no such needle. It moves around its axis, which is an imaginary line.



Let's Do

Take a big round potato or a ball. Taking a knitting needle pierce through it. It resembles the axis shown in a globe. You can now move the potato or the ball around this axis from left to right.

Another imaginary line running on the globe divides it into two equal parts. This line is known as the **equator**. The northern half of the earth is known as the Northern Hemisphere and the southern half is known as the Southern Hemisphere. They are both equal halves. Therefore, the equator is an imaginary circular line and is a very important reference point to locate places on the earth. All parallel circles from the equator up to the poles are called **parallels of latitudes**. Latitudes are measured in degrees.

The equator represents the zero degree latitude. Since the distance from the equator to either of the poles is one-fourth of a circle round the earth, it will measure $\frac{1}{4}$ th of 360 degrees, i.e. 90°. Thus 90 degrees north latitude marks the North Pole and 90 degrees south latitude marks the South Pole.

As such, all parallels north of the equator are called 'north latitudes'. Similarly all parallels south of the equator are called 'south latitudes'.

The value of each latitude is, therefore, followed by either the word north or

Do you know?

By measuring the angle of the Pole Star from your place, you can know the latitude of your place.

south. Generally, this is indicated

by the letter 'N' or 'S'. For example, both Chandrapur in Maharashtra (India) and Belo Horizonte in Brazil (South America) are located on parallels of about 20° N latitude and Belo Horizonte is situated at 20° S latitude. We see in Figure 2.2 that as we move away from the equator, the size of the parallels of latitude decreases.

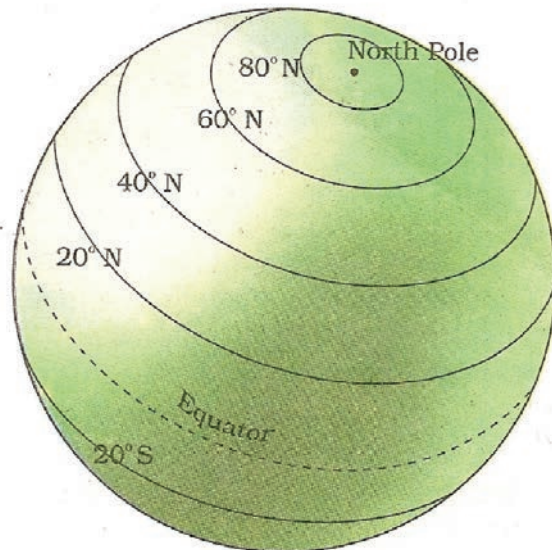


Figure 2.2: Latitude

IMPORTANT PARALLELS OF LATITUDES

Besides the equator (0°), the North Pole (90° N) and the South Pole (90° S), there are four important parallels of latitudes – (i) **Tropic of Cancer** (23 $\frac{1}{2}$ ° N) in the Northern Hemisphere. (ii) **Tropic of Capricorn** (23 $\frac{1}{2}$ ° S) in the Southern Hemisphere. (iii) **Arctic Circle** at 66 $\frac{1}{2}$ ° north of the equator, (iv) **Antarctic Circle** at 66 $\frac{1}{2}$ ° south of the equator.

HEAT ZONES OF THE EARTH

The mid-day sun is exactly overhead at least once a year on all latitudes in between the Tropic of Cancer and the Tropic of Capricorn. These are, therefore,

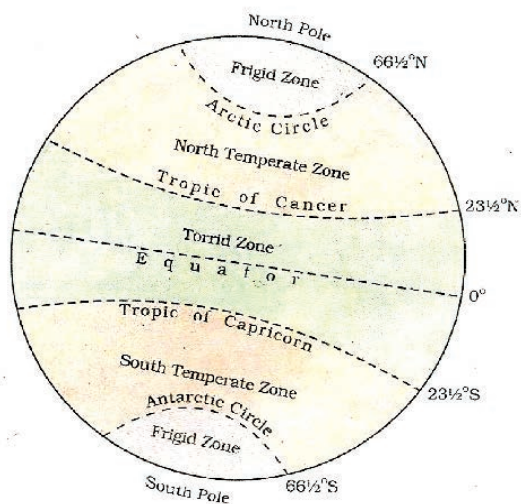


Figure 2.3: Important Latitude and Heat Zones

GLOBE – Latitudes and Longitudes

receives the maximum heat and is called the **Torrid Zone**.

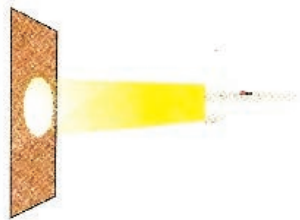


Figure 2.4 : (a)

Torch-light falling on a straight surface is bright and covers a smaller area.

The mid day sun never shines overhead on any latitude beyond the Tropic of Cancer and the Tropic of Capricorn. The angle of the sun's rays goes on decreasing towards the poles. As such, the areas bounded by 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, have moderate temperatures. These are, therefore, called **Temperate Zones**.

Areas lying between the Arctic Circle and the North Pole in the Northern Hemisphere and the Antarctic Circle and the South Pole in the Southern Hemisphere, are very cold. It is because here the sun does not rise much above the horizon. Therefore, its rays are always slanting. These are, therefore called **Frigid Zones**.



Figure 2.4 : (b)

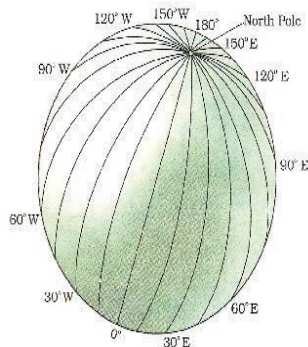
Torch-light falling on a slanted surface is less bright but covers a bigger area.

WHAT ARE LONGITUDES?

To fix the position of a place, it is necessary to know something more than the latitude of that place. You can see, for example, that Hyderabad (in Pakistan) and Allahabad (in India) are situated on the same latitude (i.e., 25° 25' N). Now, in order to locate them precisely, we must find out how far east or west these places are from the given line of reference running from the North Pole to the South Pole. These lines of references are called the meridians of longitude, and that distances between them are measured in 'degrees of longitude'. Each degree is further divided into minutes, and minutes into seconds.

They are semi-circles and the distance between them decreases steadily polewards until it becomes zero at the poles, where all the meridians meet.

Unlike parallels of latitude, all meridians are of equal length. Thus, it was difficult to number the meridians. Hence, all countries decided that the count should be from the meridian which passed through Greenwich, where the British Royal



Let's Do

Draw a circle. Let the Prime meridian divide it into two equal halves. Colour and label the eastern hemisphere and the western hemisphere. Similarly draw another circle and let the equator divide it into two halves. Now colour the Northern hemisphere and Southern hemisphere.

Observatory is located. This meridian is called the **Prime Meridian**. Its value is 0° longitude and from it we count 180° eastward as well as 180° westward. The Prime Meridian divides the earth into two equal halves, the Eastern Hemisphere and the Western Hemisphere. Therefore, the longitude of a place is followed by the letter E for the east and W for the west. It is, however, interesting to note that 1800 East and 1800 West meridians are on the same line.

Now look at the grid of the parallels of latitude and meridians of longitude on the globe (Figure 2.6). You can locate any point on the globe very easily if you know its latitude and longitude.

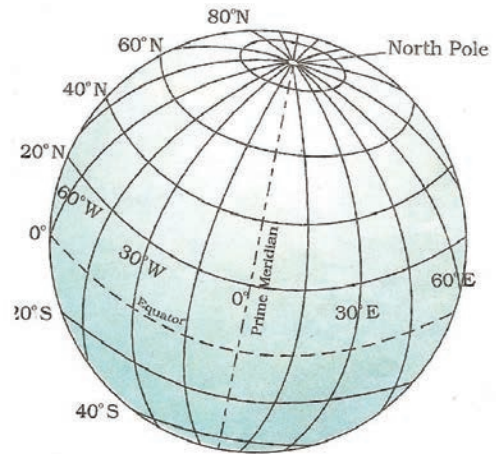


Figure 2.6 : Grid

For example, Dhubri in Assam is situated at 26° N latitude and 90° E longitude. Find out the point where these two lines cut each other. That point will be the location of Dhubri.

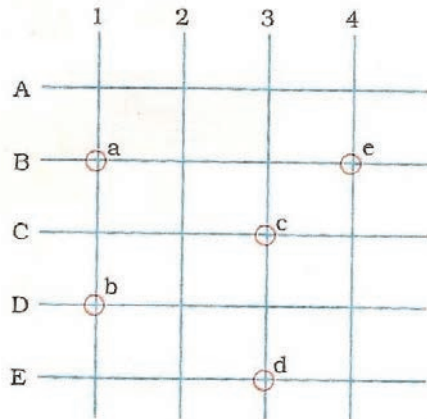


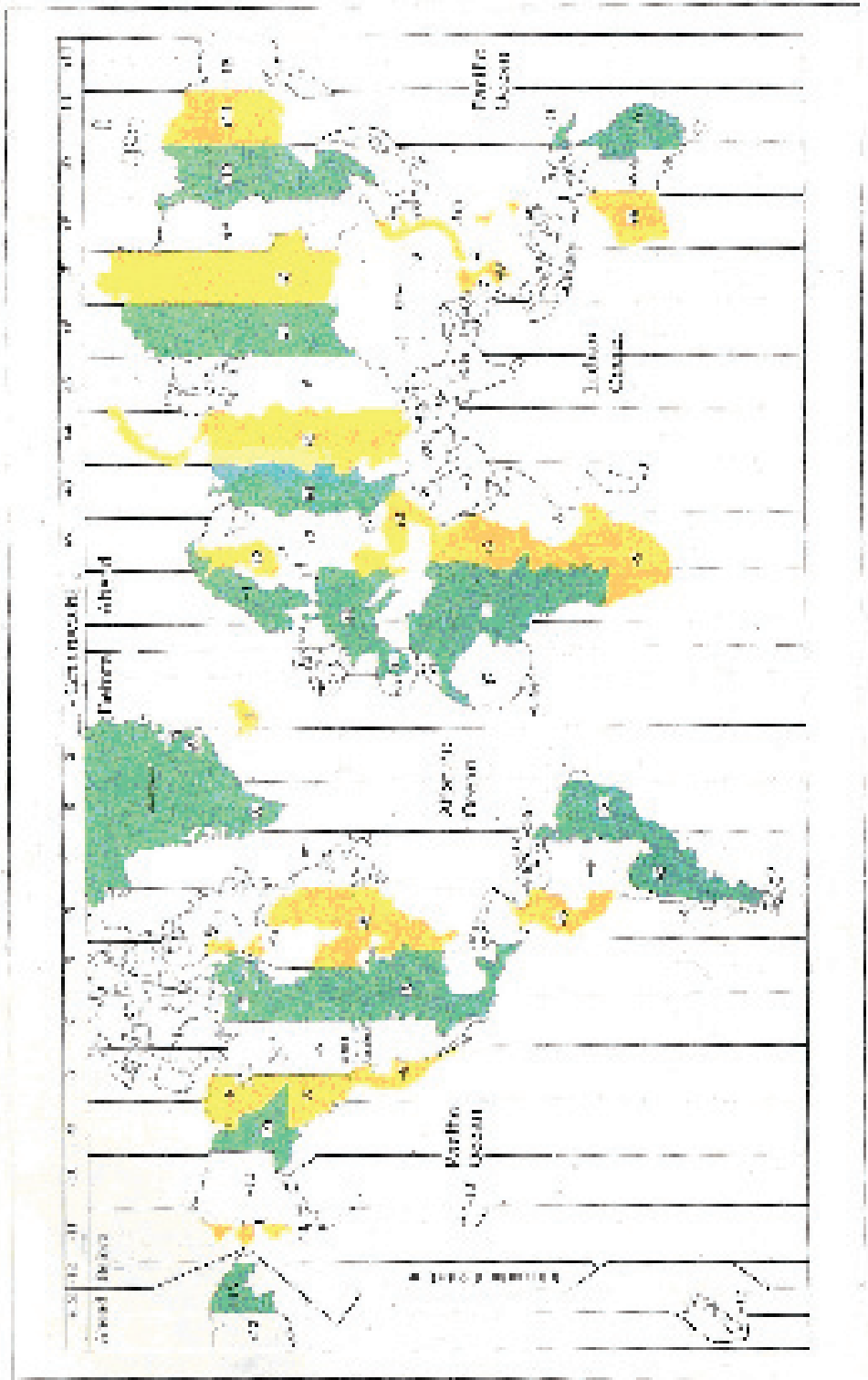
Figure 2.7

To understand this clearly draw equidistant vertical and horizontal lines on a paper (Figure 2.7). Label the vertical rows with numbers and horizontal rows with letters, draw some small circles randomly on points where these horizontal and vertical lines intersect each other. Name these small circles as a, b, c, d and e.

Let vertical lines represent East Longitudes and horizontal lines as North Latitudes.

Find out the location of other circles.

GLOBE – Latitudes and Longitudes



LONGITUDE AND TIME

The best means of measuring time is by the movement of the earth, the moon and the planets. The sun regularly rises and sets every day, and naturally, it is the best time-keeper throughout the world. Local time can be reckoned by the shadow cast by the sun, which is the shortest at noon and longest at sunrise and sunset.

When the Prime Meridian of Greenwich has the sun at the highest point in the sky, all the places along this meridian will have mid-day or noon.

As the earth rotates from west to east, those places east of Greenwich will be ahead of Greenwich time and those to the west will be behind it (Figure 2.8). The rate of difference can be calculated as follows. The earth rotates 360° in about 24 hours, which means 15° east an hour or 10 minutes in four minutes. Thus, when it is 12 noon at Greenwich, the time at 150° east of Greenwich will be $15 \times 4 = 60$ minutes, i.e., 1 hour ahead of Greenwich time, which means 1 p.m. But at 150° west of Greenwich, the time will be behind Greenwich time by one hour, i.e. it will be 11.00 a.m. Similarly, at 180°, it will be midnight when it is 12 noon at Greenwich.

At any place a watch can be adjusted to read 12 o'clock when the sun is at the highest point in the sky, i.e., when it is mid-day. The time shown by such a watch will give the local time for that place. You can see that all the places on a given meridian of longitude have the same local time.

WHY DO WE HAVE STANDARD TIME?

The local time of places which are on different meridians are bound to differ. For example, it will be difficult to prepare a time-table for trains which cross several latitudes. In India, for instance, there will be a difference of about 1 hour and 45 minutes in the local times of Dwarka in Gujarat and Dibrugarh in Assam. It is, therefore, necessary to adopt the local time of some central meridian of a country as the standard time for the country. In India, the longitude of $82\frac{1}{2}^{\circ}$ E ($82^{\circ} 30' \text{E}$) is treated as the standard meridian. The local time at this meridian is taken as the standard time for the whole country. It is known as the Indian Standard Time (IST).

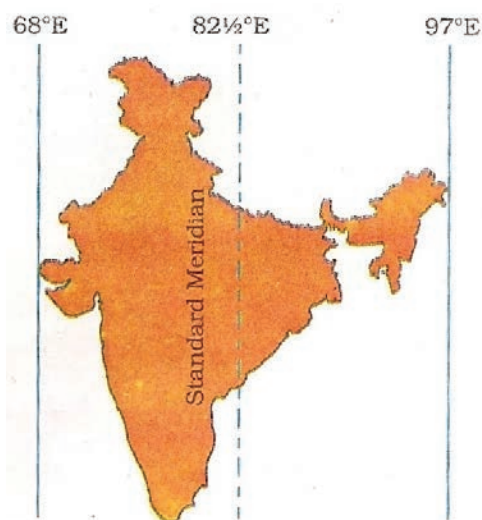


Figure 2.9 : Indian Standard Meridian

GLOBE – Latitudes and Longitudes

Kabeer lives in a small town near Bhopal. He tells his friend Alok that they will not be able to sleep tonight. A day and night cricket match between India and England had started at 2 p.m. in London. This means that the match would begin at 7.30 p.m. in India and finish well into the night. Do you know what is the time difference between India and England?

India located east of Greenwich at $82^{\circ}30'E$ is 5 hours and 30 minutes ahead of GMT. So it will be 7.30 p.m. in India when it is 2:00 p.m. noon in London.



EXERCISES

Some countries have a great longitudinal extent and so they have adopted more than one standard time. For example, in Russia, there are as many as eleven standard times. The earth has been divided into twenty-four time zones of one hour each. Each zone thus covers 15° of longitude.

1. Answer the following questions briefly.

- What is the true shape of the earth?
- What is a globe?
- What is the latitudinal value of the Tropic of Cancer?
- What are the three heat zones of the Earth?
- What are parallels of latitude and meridians of longitude?
- Why does the torrid zone receive maximum amount of heat?
- What is it 5.30 p.m. in India and 12.00 noon in London?

2. Tick the correct answers.

- The value of the prime meridian is
 - 900
 - 00
 - 600
- The frigid zone lies near
 - the Poles
 - the Equator
 - the Tropic of Cancer

- (c) The total number of longitudes are
 (i) 360 (ii) 180 (iii) 90
- (d) The Antarctic circle is located in
 (i) the Northern hemisphere
 (ii) the Southern hemisphere
 (iii) The Eastern hemisphere
- (e) Grid is a network of
 (i) parallels of latitudes and meridians of longitudes
 (ii) the Tropic of Cancer and the Tropic of Capricorn
 (iii) the North Pole and the South Pole.
3. Fill in the blanks
- (1) The Tropic of Capricorn is located at _____.
- (2) The Standard Meridian of India is _____.
- (3) The 00 Meridian is also known as _____.
- (4) The distance between the longitudes decreases towards _____.
- (5) The Arctic Circle is located in the _____ hemisphere.



Things to do

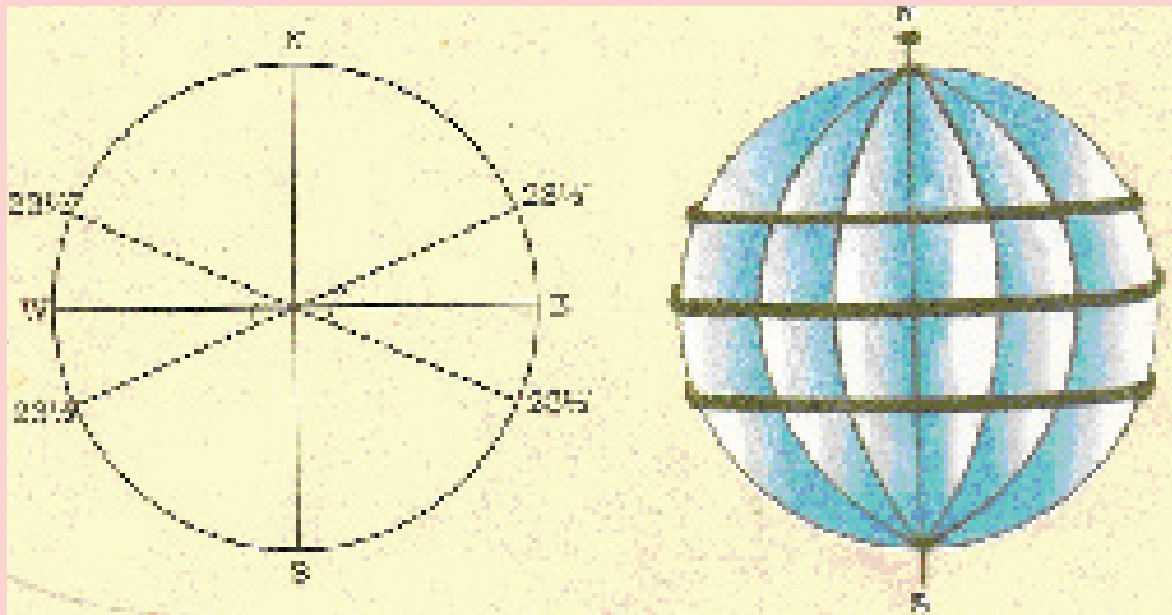
1. Draw a diagram of the earth showing the earth's axis, the Equator, Tropics of Cancer and Capricorn, Arctic Circle and Antarctic Circle.

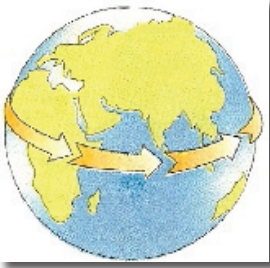
GLOBE – Latitudes and Longitudes

For Fun.

1. Draw and cut out six circles of the same size (approx. 3 cm. radius) from cardboard. Mark diameters (NS, EW) and $23\frac{1}{2}^\circ$ angles on each face of the circles as shown on the figure. Place the circle one on top of the other and stitch along the line NS. Now there are twelve semi-circles. Let one semi-circle represent 0° or Greenwich Meridian (Prime Meridian). The 6th semi-circle from it will be the 180° Meridian. Between the 0° and 180° there are 5 semi-circles on both sides which are West and East longitudes 30° apart. On two ends of the stapled line stick pins to represent the North and South Poles.

A rubber band around the model touching the EW points will represent the Equator. Two rubber bands touching the $23\frac{1}{2}^\circ$ points, South and North of the EW points will represent the tropics.





MOTION OF THE EARTH



Let's Do

Take a ball to represent the earth and a lighted candle to represent the sun. Mark a point on the ball to represent a town X. Place the ball in such a way that the town X is in darkness. Now rotate the ball from left to right. As you move the ball slightly, the town will have its sunrise. As the ball continues to move, the point X gradually gets away from the sun. This is sunset.

As you know that the earth has two types of motions, namely rotation and revolution. **Rotation** is the movement of the earth on its axis. The movement of the earth around the sun in a fixed path or orbit is called **Revolution**.

The axis of the earth which is an imaginary line, makes an angle of $66\frac{1}{2}^\circ$ with its orbital plane. The plane formed by the orbit is known as the **orbital plane**. The earth receives light from the sun. Due to the spherical shape of the earth, only half of it gets light from the sun at a time (Figure 3.2). The portion facing the sun experiences day while the other half away from the sun experiences night. The circle that divides the

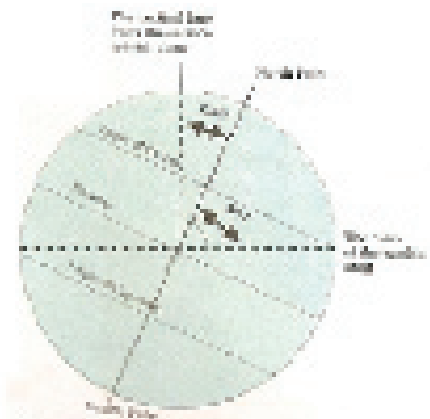


Figure 3.1 : Axis of the Earth and its orbital plane

day from night on the globe is called the **circle of**

illumination. This circle does not coincide with the axis as you see in the Figure 3.2. The earth takes about 24 hours to complete one rotation around its axis. The period of rotation is known as the earthday. This is the daily motion of the earth.



Figure 3.2 : Diagram showing the circle of illumination

continuous warmth to the region. The other half would remain in darkness and be freezing cold all the time. Life would not have been possible in such extreme conditions.

Motion of the Earth

REVOLUTION

The second motion of the earth around the sun in its orbit is called revolution. It takes $365 \frac{1}{4}$ days (one year) to revolve around the sun. We consider a year as consisting of 365 days only and ignore six hours for the sake of convenience.

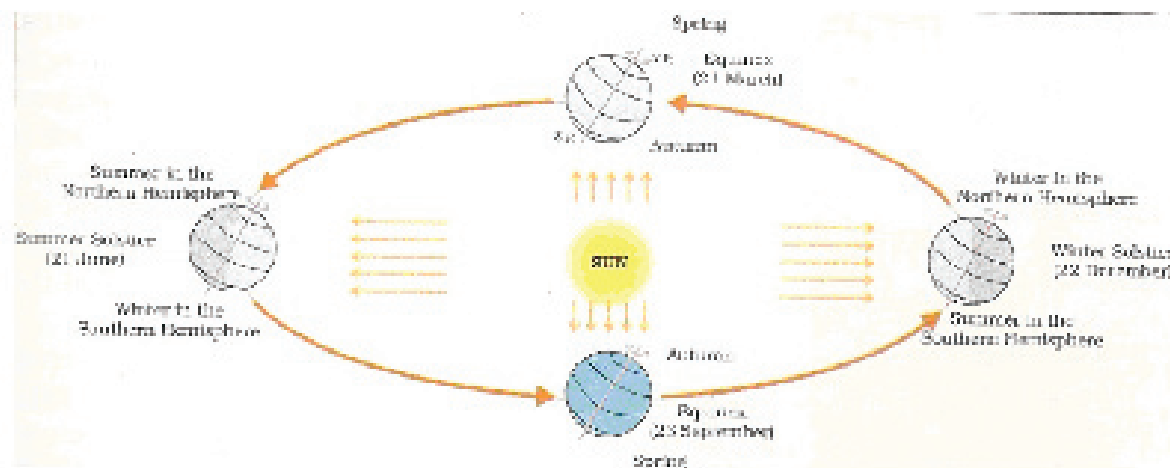


Figure 3.3 : Revolution of the Earth and Seasons

Six hours saved every year are added to make one day (24 hours) over a span of four years. This surplus day is added to the month of February. Thus every fourth year, February is of 29 days instead of 28 days. Such a year with 366 days is called a **leap year**. Find out when will the next leap year be?



Let's Do

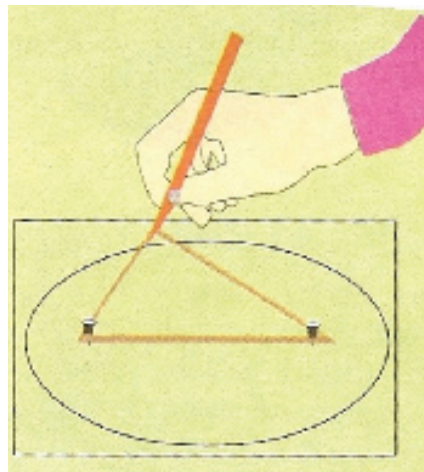
Do you know how to draw an ellipse? Take a pencil, two pins and a loop of thread. Now fix these pins on a paper as shown in the figure. Put the loop on the paper enclosing these two pins inside the loop. Now hold the pencil and draw the line keeping the thread tight and moving the pencil along it. The figure represents an ellipse.

From the Figure 3.3, it is clear that the earth is going around the sun in an **elliptical orbit**.

Notice that throughout its orbit, the earth is inclined in the same direction.

A year is usually divided into summer, winter, spring and autumn seasons. Seasons change due to the change in the position of the earth around the sun.

Look at the Figure 3.3. You will see that on 21st June, the



Northern Hemisphere is tilted towards the sun. The rays of the sun fall directly on the Tropic of Cancer. As a result, these areas receive more heat. The areas near the poles receive less heat as the rays of the sun are slanting. The North Pole is inclined towards the sun and the places beyond the Arctic Circle experience continuous daylight for about six months. Since a large portion of the Northern Hemisphere is getting light from the sun, it is summer in the regions north of the equator. The longest day and the shortest night at these places occur on 21st June. At this time in the Southern Hemisphere all these conditions are reversed. It is winter season there. The nights are longer than the days. This position of the earth is called the **Summer Solstice**.

On 22nd December, the Tropic of Capricorn receives direct rays of the sun as the South Pole tilts towards it. As the sun's rays fall vertically at the Tropic of Capricorn (23 ½° S), a larger portion of the Southern Hemisphere gets light. Therefore, it is summer in the Southern Hemisphere with longer days and shorter nights. The reverse happens in the Northern Hemisphere. This position of the earth is called the **Winter Solstice**. Do you know that Christmas is celebrated in Australia in the summer season?

On 21st March and September 23rd, direct rays of the sun fall on the equator. At this position, neither of the poles is tilted towards the sun; so, the whole earth experience equal days and equal nights. This is called an **equinox**.

On 23rd September, it is autumn season in the Northern Hemisphere and spring season in the Southern Hemisphere. The opposite is the case on 21st March, when it is spring in the Northern Hemisphere and autumn in the Southern Hemisphere.

Thus, you find that there are days and nights and changes in the seasons because of the rotation and revolution of the earth respectively.



Let's Do

To understand the earth's inclination in the same direction, draw a big ellipse on the ground and take a flag with a stick. Stand anywhere on the line of the ellipse. Point your flag to a fixed point far away like on a tree-top. Now move along the ellipse keeping your flag always pointing towards that fixed point. In this way, the axis of the earth remains inclined permanently in the same position. The revolution of the earth remains and the inclination of the earth's axis in a fixed direction cause seasons.

Motion of the Earth



EXERCISES

1. Answer the following questions briefly.

- (a) What is the angle of inclination of the earth's axis with its orbital plane?
- (b) Define rotation and revolution.
- (c) What is a leap year?
- (d) Differentiate between the Summer and Winter Solstice?
- (e) What is an equinox?
- (f) Why does the Southern Hemisphere experience Winter and Summer Solstice in different times than that of the Northern Hemisphere?
- (g) Why do the poles experience about six months day and six months night?

2. Tick the correct answers.

- (a) The movement of the earth around the sun is known as
 - (i) Rotation (ii) Revolution (iii) Inclination
- (b) Direct rays of the sun fall on the equator on
 - (i) 21 March (ii) 21 June (iii) 22 December
- (c) Christmas is celebrated in summer in
 - (i) Japan (ii) India (iii) Australia
- (d) Cycle of the seasons is caused due to
 - (i) Rotation (ii) Revolution (iii) Gravitation

3. Fill in the blanks.

- (a) A leap year has _____ number of days.

- (b) The daily motion of the earth is _____.
- (c) The earth travels around the sun in _____ orbit.
- (d) The sun's rays fall vertically on the Tropic of _____ on 21st June.
- (e) Days are shorter during _____ season.



Things to do

1. Make a drawing to show the inclination of the earth.
2. Record the timings of sunrise and sunset at your place taking help from your local newspaper on the 21st of each month and answer the following:
 - (a) In which month are the days shortest
 - (b) In which months are the days and nights nearly equal.

For Fun.

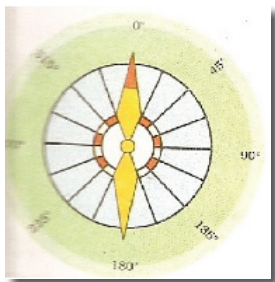
1. Draw different shapes of ellipses by placing two pins nearer and farther using the same loop of thread. Notice when the ellipse becomes circular.
2. On any sunny day, take a straight stick that is one metre long. Find out a clean and level place on the ground. Place this stick into the ground where it casts a distinctive (sharp) shadow.

Step (1). Mark the tip of the shadow with a stone or a twig or by any other means. The first shadow mark is always towards the west. See after 15 minutes and mark the tip of the shadow again. By then it would have moved a few centimeters away. Now join the two points and you have an approximate east-west line.

Step (2): Stand with the first mark to your left and the second mark to your right you are now facing north. This fact is true everywhere on the earth because the earth rotates in west to east direction.

An alternative method is more accurate but requires more time. Set up your shadow stick and mark the first shadow in the morning. Use a piece of string to draw a clean arc through this mark around the stick. At mid-day, the shadow will shrink or disappear. In the afternoon, it will lengthen again and at the point where it touches the arc, make a second mark. Draw a line through the two marks to get an accurate east-west line.

Chapter 4



MAPS:

You have learnt in the previous chapter about the advantages of a globe. However, globe has limitations as well. A globe can be useful when we want to study the earth as a whole. But. When we want to study only a part of the earth, as about our country, states, districts, towns and villages, it is of little help. In such a situation we use maps. A **map** is a representation or a drawing of the earth's surface or a part of it drawn on a flat surface according to a scale. But it is impossible to flatten a round shape completely.

We find that maps shows a small area and a few facts. Another map may contain as many as a big book. When many maps are put together we get an Atlas. Atlases are of various sizes, measurements drawn on different scales. Maps prove more information than a globe. They are of different types. Some of them are described below.



Let's Do

Take an old rubber ball and make any drawing all over it. You may also mark North Pole and South Pole on it. Now cut this ball with knife and try to flatten it. See how drawings are distorted.

PHYSICAL MAPS

Maps showing natural features of the earth such as mountains, plateaus, plains, rivers, oceans etc. are called **physical or relief maps**.

POLITICAL MAPS

Maps showing cities, towns and villages, and different countries and states of the world with their boundaries are called **political maps**.

THEMATIC MAPS

Some maps focus on specific information; such as road maps, rainfall maps, maps showing distribution of forests, industries etc, are known as **thematic maps**. Suitable titles are given on the basis of information provided in these maps.

There are three **Components of Maps** – distance, direction and symbol.

DISTANCE

Maps are drawings, which reduce the entire world or a part of it to fit on a sheet of paper. Or we can say maps are drawn to reduced scales. But this reduction is done very carefully so that the distance between the places is real. It can only be possible when a small distance on paper represents a large distance on the ground. Therefore, a scale is chosen for this purpose. Scale is the ratio between the actual distance on the ground and the distance shown on the map. For example, the distance between your school and you home is 10 km. If you show this 10 km, distance by 2 cm on a map, it means, 1 cm on the map will show 5 km, on the ground. The scale of you drawing will be 1 cm = 5 km. Thus, scale is very important in any map. If you know the scale, you will be able to calculate the distance between any two places on a map.

When a small area like your village or town is to be shown on paper, then we use a large scale that is 5 cm. on the map shows 500 metres only on the ground. It is called a **large scale map**.

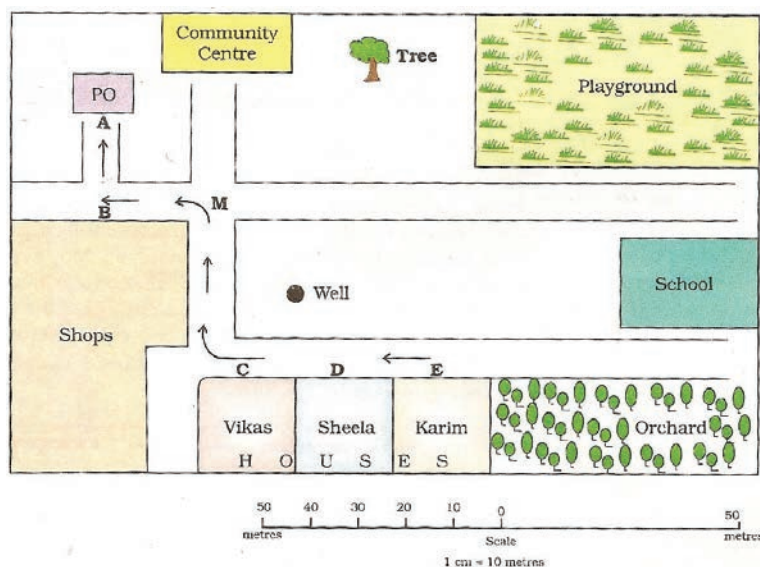
Direction

Most maps contain an arrow marked with the letters 'N' at the upper right hand corner. This arrow shows the northern direction. It is called the north line. When you know the north, you can find out other directions, for example east, west and south. There are four major directions, North, South, East and West {Figure 4.2 (a)}. They are called cardinal points. Other four



Let's Do

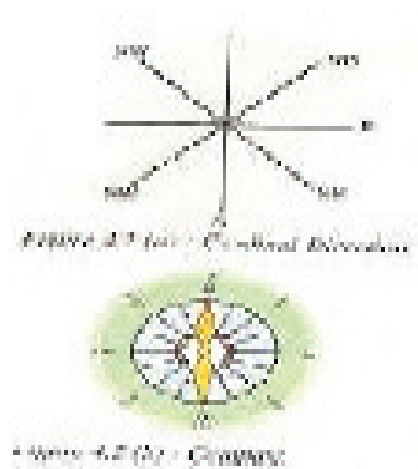
Look at the Figure 4.1. There is a scale. It may be used for measuring distance between places. For example the distance between the well and the tree is 5 cm. It means that the actual distance is 50 metres. Now the distance between the PO (A) to Karim's house (E) is 12 cm. It means 120 metres on the ground but you can not fly like a bird directly from E to A. You will have to walk on the road. Let us measure the total walking distance from E to C, then C to M, M to B and B to A. Add all these distances. This will be the total walking distance from Karim's house to the post office.



intermediate directions are north-east (NE), south-east (SE), south-west (SW) and north-west (NW). We can locate any place more accurately with the help of these intermediate directions.

Find out the following directions from the Figure 4.1: (a) The direction of the Community Centre, the playground from Vikas's house (b) the direction of school from shops.

We can find out the direction of a place with the help of a compass. It is an instrument used to find out main directions. Its magnetic needle always points towards north-south direction {Figure 4.2 (b)}.



SYMBOLS

It is the third important component of a map. It is not possible to draw on a map the actual shape and size of different features such as buildings, roads, bridges, trees, railway lines or a well. So, they are shown by using certain letters, shades, colours, pictures and lines. These symbols give a lot of information in a limited space. With the use of these symbols, maps can be drawn easily and are simple to read. Even if you don't know the language of an area and therefore cannot ask someone for directions, you can collect information from maps with the help of these symbols. Maps have a universal language that can be understood by all. There is an international agreement regarding the use of these symbols. These are called conventional symbols. Some of the conventional symbols are shown in the Figure 4.3.





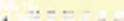


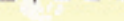













Railway Line	Broad gauge, Metro gauge, Railway station	  
Roads	Metalled, Unmetalled	 
Boundary	International, State, District,	  
River, Well, Tank, Canal, Bridge		    
Temple, Church, Mosque, Chhatra		   
Post Office, Post & Telegraph Office, Police Station		PO, PTO, PS
Settlements, Graveyard		 
Trees, Grass		 

Figure 4.3: Conventional Symbols

Maps

Various colours are used for the same purpose. For example, generally blue is used for showing water bodies, brown for mountain, yellow for plateau and green is used for plains.

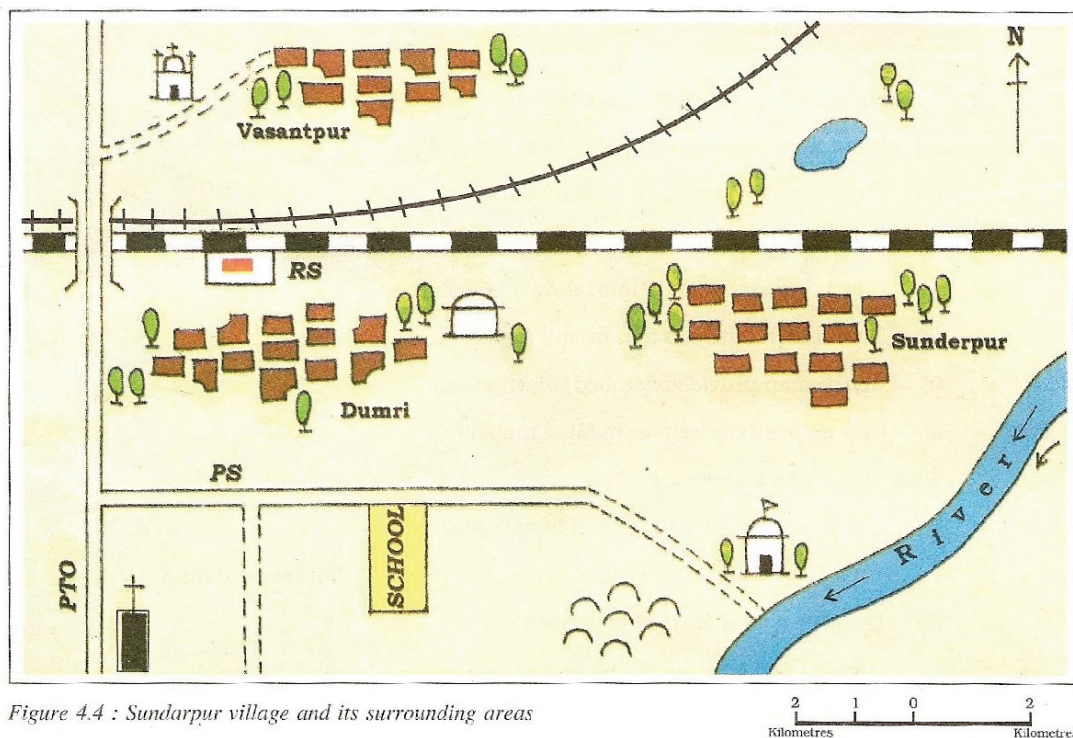


Figure 4.4 : Sundarpur village and its surrounding areas

SKETCH

A Sketch is a drawing mainly based on memory and spot observation and not to scale. Sometimes a rough drawing is required of an area to tell where a particular place is located with respect to other places. Suppose, you want to go to your friend's house, but you don't know the way. Your friend may make a rough drawing to show the way to his house. Such a rough drawing is drawn without scale, and is called a *sketch map*.

PLAN

A **Plan** is a drawing of a small area on a

Look at the Figure 4.4 and find out:

- In which direction is the river flowing?
- What kind of road passes by the side of village Dumri?
- Sundarpur is situated on what type of railway line.
- The Police station is situated on which side of the railway bridge.
- On which side of the railway line do the following lie.
 - Chhatra
 - Church
 - Pond
 - Mosque
 - River
 - Post and Telegraph Office
 - Grave yard

large scale. A large-scale map gives lot of information, but there are certain things which we may sometimes want to know for example the length and breadth of a room, which can't be shown in a map. At that time, we can refer drawings drawn to scale called a *plan*.



EXERCISES

1. Answer the following questions briefly.

- (a) What are the three components of a map?
- (b) What are the four cardinal directions?
- (c) What do you mean by the term 'the scale of the map'?
- (d) How are maps more helpful than a globe?
- (e) Distinguish between a map and a plan.
- (f) Which map provides detailed information?
- (g) How do symbols help in reading maps?

2. Tick the correct answers.

- (a) Maps showing distribution of forest are

(i) Physical map	(ii) Thematic map	(iii) Political map
------------------	-------------------	---------------------
- (b) The blue colour is used for showing

i) Water bodies	(ii) Mountains	(iii) Plains
-----------------	----------------	--------------
- (c) A compass is used -
 - (i) To show symbols
 - (ii) To find the main direction
 - (iii) To measure distance

Maps

- (d) A scale is necessary
- (i) For a map
 - (ii) For a sketch
 - (iii) For symbols



Things to do.

1. Draw a plan of your classroom and show the teacher's table, blackboard, desks, door and windows.
2. Draw a sketch of your school and locate the following:
 - (a) the principal's room (b) your classroom
 - (c) the playground (d) the library
 - (e) some big trees (f) drinking water.

For Fun.

1. Make the plan (in the space given below) of a fun-park where you can enjoy several activities : for example swings, slides, see-saw, merry-go-round, boating, swimming, looking into funny mirrors, etc. or anything else that you can think of.

Chapter 5



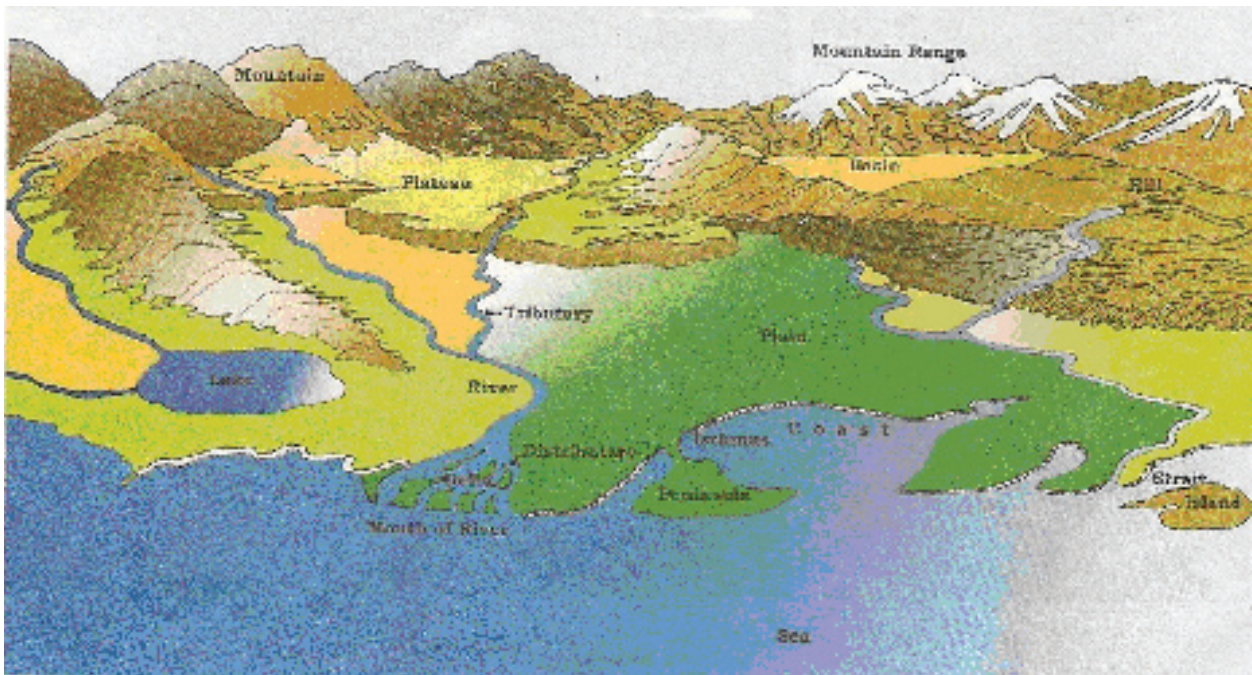
Major Landforms of the Earth

You must have seen some of the landform features as shown in the Figure 6.1 below. You will notice that the surface of the earth is not the same everywhere. The earth has an infinite variety of landforms. Some parts of the lithosphere may be rugged and some flat.

These landforms are a result of two processes. You will be amazed to know that the ground you are standing on is slowly moving. Within the earth, a continuous movement is taking place. The first, or the **internal process** leads to the upliftment and sinking of the earth's surface at several places.

Do you know?

A hill is a land surface higher than the local area. Broadly, a steep hill with an elevation of more than 600 metres is termed as a mountain. Name some mountains with a height of more than 8,000 metres.



The second, or the **external process** is the continuous wearing down and rebuilding of the land surface. The wearing away of the earth's surface is called erosion. The surface is being lowered by the process of **erosion** and rebuilt by

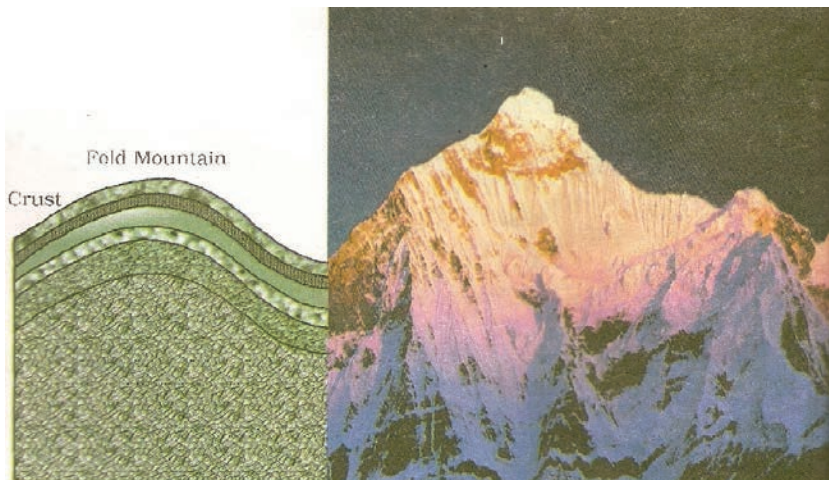
Major Landforms of the Earth

the process of **deposition**. These two processes are carried out by running water, ice and wind. Broadly, we can group different landforms depending on elevation and slope as **mountains, plateaus and plains**.

MOUNTAINS

A **mountain** is any natural elevation of the earth surface. The mountains may have a small summit and a broad base. It is considerably higher than the surrounding area. Some mountains are even higher than the clouds. As you go higher, the climate becomes colder.

In some mountains, there are permanently frozen rivers of ice. They are called glaciers. There are some mountains you cannot see as they are under the sea. Because of harsh climate, less people live in the mountain areas. Since the slopes are steep, less land is available for farming.



Let's Do



Making of a Mountain:

1. All you require is a pile of paper.
2. Put the papers on your table.
3. Push the papers from both sides by your hands.
4. The sheet will be folded and rise into a peak.
5. You have made a mountain!

In the same process our Himalayas and the Alps were formed.

Mountains may be arranged in a line known as **range**. Many mountain systems consist of a series of parallel ranges

Do you know?

Mauna Kea (Hawaii) in the Pacific Ocean is an undersea mountain. It is higher than Mount Everest being 10,205 metres high.

extending over hundreds of kilometres. The Himalayas, the Alps and the Andes are mountain ranges of Asia, Europe and South America, respectively (Figure 5.1????). Mountains vary in their heights and shape.

There are three types of mountains – **Fold Mountains, Block Mountains and the Volcanic Mountains**. The Himalayan Mountains and the Alps are young fold mountains with rugged relief and high conical peaks. The Aravali ange in India is one of the oldest fold mountain systems in the world. The range has considerably worn down due to the processes of erosion. The Appalachians in North America and the Ural mountains in Russia have rounded features and low elevation. They are very old fold mountains.

Fold Mountains are created when large areas are broken and displaced vertically. The uplifted blocks are termed as **horsts** and the lowered blocks are called **graben**. The Rhine valley and the Vosges mountain in Europe are examples of such mountain systems. Locate them on the world map in the atlas and find out some more examples of this type of landforms.

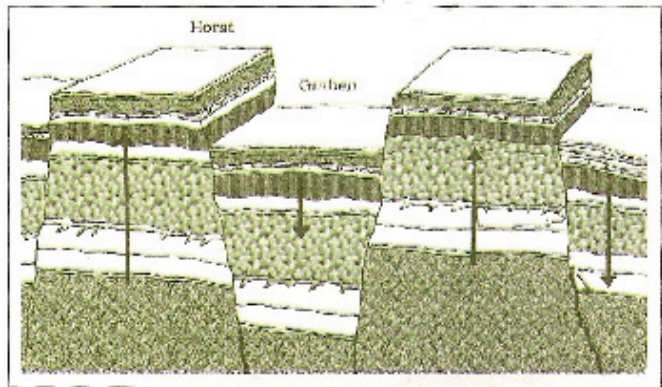


Figure 6.3 : A Block Mountain

Volcanic mountains are formed due to **Volcanic activity**. Mt. Kilimanjaro in Africa and Mt. Fujiyama in Japan are examples of such mountains.

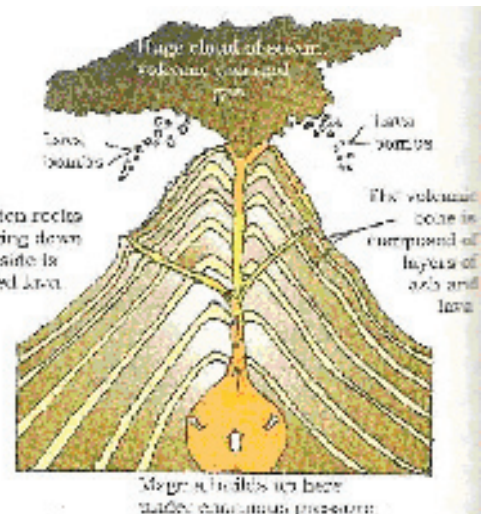
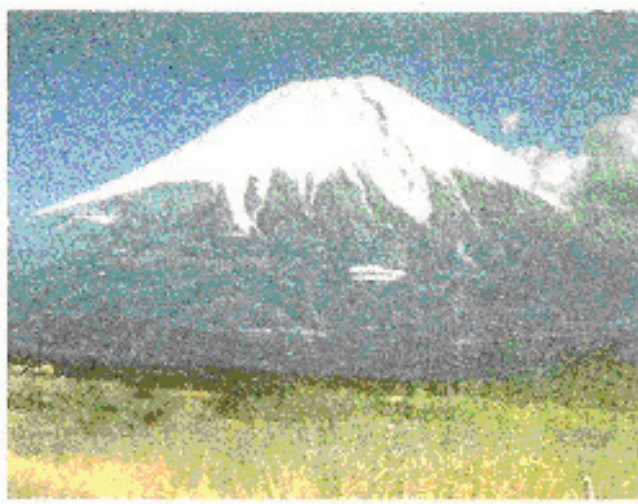


Figure 6.4 : Volcanic Mountain

Major Landforms of the Earth

Mountains are very useful. The mountains are a **storehouse** of water. Many rivers have their source in the **glaciers** in the mountains. Reservoirs are made and the water is harnessed for the use of people. Water from the mountains is also used for irrigation and generation of hydro-electricity. The **river valleys** and **terraces** are ideal for cultivation of crops. Mountains have a rich variety of **flora** and **fauna**. The forests provide fuel, shelter and other products like gum, raisin, etc. Mountains provide an idyllic site for tourists. They visit the mountains for their scenic beauty. Several sports like paragliding, hang gliding river rafting and skiing are popular in the mountains. Can you name some places in the Himalayas associated with these sports?



Can you name this game

Plateaus

A plateau is an elevated flat land. It is a flat – topped table land standing above the surrounding area. A plateau may have one or more sides with steep slopes.



Figure 6.5 : Plateau

The height of plateau often varies from few hundred metres. Plateaus, like mountains may be young or old. The Deccan plateau in India is one of the oldest plateaus. The East African Plateau in Kenya, Tanzania and Uganda and the Western plateau of Australia are other examples. The Tibet plateau is the highest plateau in the world with a height of 4,000 to 6,000 metres above the mean sea level.

Plateaus are very useful because they are rich in mineral deposits. As a result, many of the mining areas in the world are located in the plateau areas. The African plateau is famous for gold and diamond mining. In India huge reserves of iron, coal and manganese are found in the Chhotanagpur plateau.

In the plateau areas, there may be several waterfalls as the river falls from a great height. In India, the Hundru falls in the Chhotanagpur plateau on the river Subarnarekha and the Jog falls in Karnataka are examples of such waterfalls.

The lava plateaus are rich in black soil that are fertile and good for cultivation. Many plateaus have scenic spots and are of great attraction to tourists.

PLAINS

Plains are large stretches of flat land. They are, generally, not more than 200 metres above mean sea level. Some plains are extremely level. Others may be slightly rolling and undulating. Most of the plains are formed by rivers and their tributaries. The rivers flow down the slopes of mountains and erode them. They carry forward the eroded material. Then they deposit their load consisting of stones, sand and silt along their course and in their valleys. It is from these deposits that plains are formed.

Generally, plains are very fertile. Construction of transport network is easy. Thus, these plains are very thickly-populated regions of the world. Some of the largest plains made by the rivers are found in Asia and North America. For example, in Asia, these plains are formed by the Ganga and the Brahmaputra in India and the Yangtze in China.



Figure 6.6 : Plains

Plains are the most useful areas for human habitation. There is great concentration of people as more flat land is available for building houses, as well as for cultivation. Because of fertile soils, the land is highly productive for cultivation. In India too, the Indo-Gangetic plains are the most densely populated regions of the country.

LANDFORMS AND THE PEOPLE

Humans have been living on different kinds of landforms in different ways. Life is difficult in mountainous areas. Plains provide much better conditions. It is easy to grow



Figure 6.7 : Rope

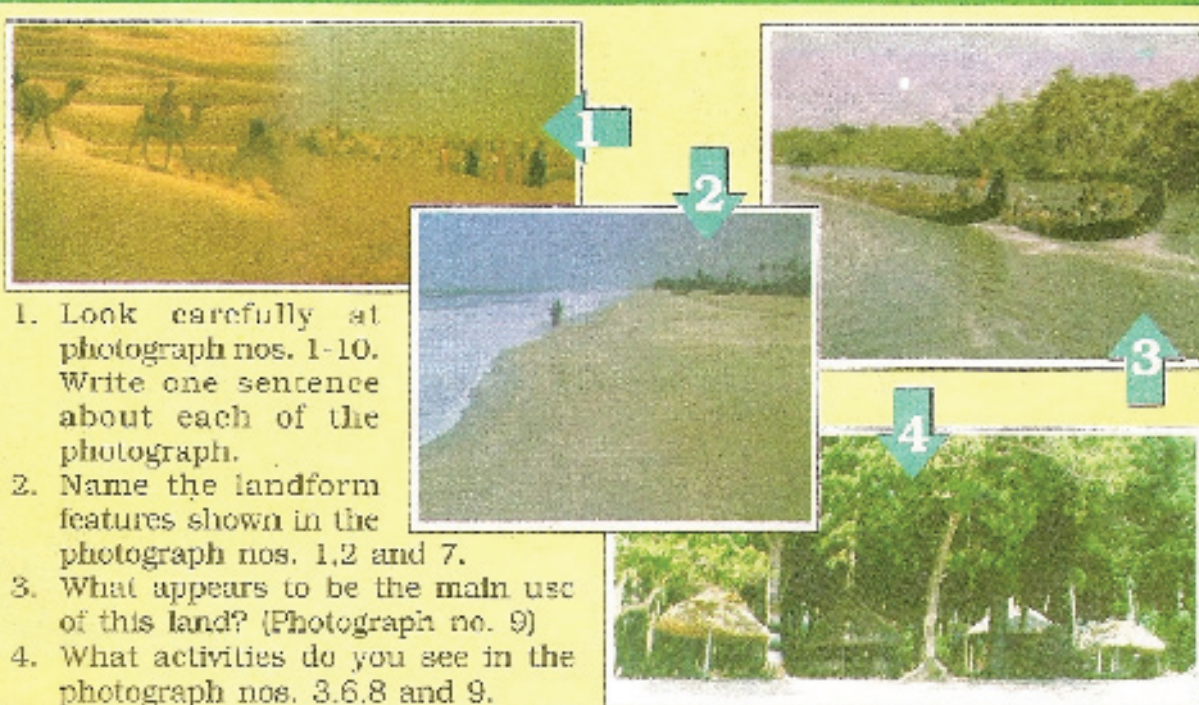
Major Landforms of the Earth

crops, build a house or a road in a plain than a mountain. Can you point out some differences in the ways of people live on different kinds of landforms? Sometimes, natural calamities such as earthquakes, volcanic eruption, storms and floods cause widespread destruction. Huge loss of life and property takes place. By creative awareness about such incidences we may lower the risks.

You may find out from your own surroundings in how many ways we use the land and water. Quite often we use the land and water. Quite often we use the land in a wasteful manner, for example constructing houses on a fertile land. Similarly we throw garbage on land or in water making them dirty. We should avoid using such important gifts of nature in a careless manner. The available land is not only for our use. It is our duty to leave the earth a better place for future generations as well.



Figure 6.8 : A polluted river



1. Look carefully at photograph nos. 1-10. Write one sentence about each of the photograph.
2. Name the landform features shown in the photograph nos. 1, 2 and 7.
3. What appears to be the main use of this land? (Photograph no. 9)
4. What activities do you see in the photograph nos. 3, 6, 8 and 9.

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5. What type of houses do you see in photograph no. 4&5.
6. Name the water sports/ games shown in photograph no. 3&8

Major Landforms of the Earth



EXERCISES

1. Answer the following questions briefly.

- (a) What are the major landforms?
- (b) What is the difference between a mountain and a plateau?
- (c) What are the different types of mountains?
- (d) How are mountains useful to man?
- (e) How are plains formed?
- (f) Why are the river plains thickly populated?
- (g) Why are mountains thinly populated?

2. Tick the correct answers.

- (a) The mountains differ from the hills in terms of
 - (i) elevation
 - (ii) slope
 - (iii) aspect
- (b) Glaciers are found in
 - (i) the mountains
 - (ii) the plains
 - (iii) the plateaus
- (c) The Deccan Plateau is located in-
 - (i) Kenya
 - (ii) Australia
 - (iii) India
- (d) The river Yangtze flows in
 - (i) South America
 - (ii) Australia
 - (iii) China
- (e) An important mountain range in Europe is
 - (i) the Andes
 - (ii) the Alps
 - (iii) the Rockies

3. Fill in the blanks.

- (1) A _____ is an unbroken flat or a low-level land.
- (2) The Himalayas and the Alps are examples of _____ types of mountains.
- (3) _____ areas are rich in mineral deposits.
- (4) The _____ is a line of mountains.
- (5) The _____ areas are most productive for farming.



Things to do.

1. What kind of landforms are found in your State?
Based on the reading of this chapter, say how they are of use to the people.

Map Skills

1. On an outline map of the world, mark the following :
 - (a) Mountain ranges: Himalayas, Rockies and Andes
 - (b) Plateau : Tibet.

Chapter 6



Our Country-India

India is a country of vast geographical expanse. In the north, it is bound by the lofty **Himalayas**. The **Arabian Sea** in the west, the **Bay of Bengal** in the east and the **Indian Ocean** in the south, wash the shores of the Indian peninsula.

The peninsula is a piece of land that is surrounded by water on three sides (figure 6.1).

India has an area of about 3.28 million sq. km. The north-south extent from Kashmir to Kanyakumari is about 3,200 km. And the east-west extent from Arunachal Pradesh to Kuchchh is about 2,900 km. The lofty mountains, the Great Indian Desert, the Northern Plains, the uneven plateau surface and the coasts and islands present a diversity of landforms. There is a great variety in the climate, vegetation, wildlife as well as in the language and culture. In this diversity, we find unity that is reflected in traditions that bind us as one nation. India has a population of more than a hundred crores since the year 2001. It is the second most populous country of the world after China.

LOCATIONAL SETTING

India is located in the northern hemisphere. The **Tropic of Cancer (23°30'N)** passes almost halfway through the country (Figure 7.2). From south to north, India extends between **8°4'N** and **37°6'N** latitudes. From west to east, India extends between **68°7'N** and **97°25'N** longitudes. If we divide the world into eastern and western hemisphere, which hemisphere would India belong to? Due to great longitudinal extent of about 29°, there could be a wide differences in local time of places located at two extreme points of India. As such, the difference between these two points would be of about two hours. As you have learnt earlier, the local time changes by four minutes for every one degree of longitude. The such rises two hours earlier in the east (Arunachal Pradesh) than in the west (Gujarat). You have already read earlier, why the local time of longitude of 82° 30'E has been taken as the Indian Standard Time. This meridian or longitude is also termed as the Standard Meridian of India.

Do you know?

Large countries which stretch extensively from east to west do not have a single Standard Time for the whole country. The USA and Canada have six time zones extending from the Pacific coast to the Atlantic coast. Do you remember how many time zones are there in Russia.

INDIA'S NEIGHBOURS

There are seven countries that share land boundaries with India. Find out names of these countries from the Figure 7.1. How many of these countries do not have access to any ocean or sea? Across the sea to the south, lie our island neighbours – Sri Lanka and Maldives. Sri Lanka is separated from India by the *Palk Strait*.

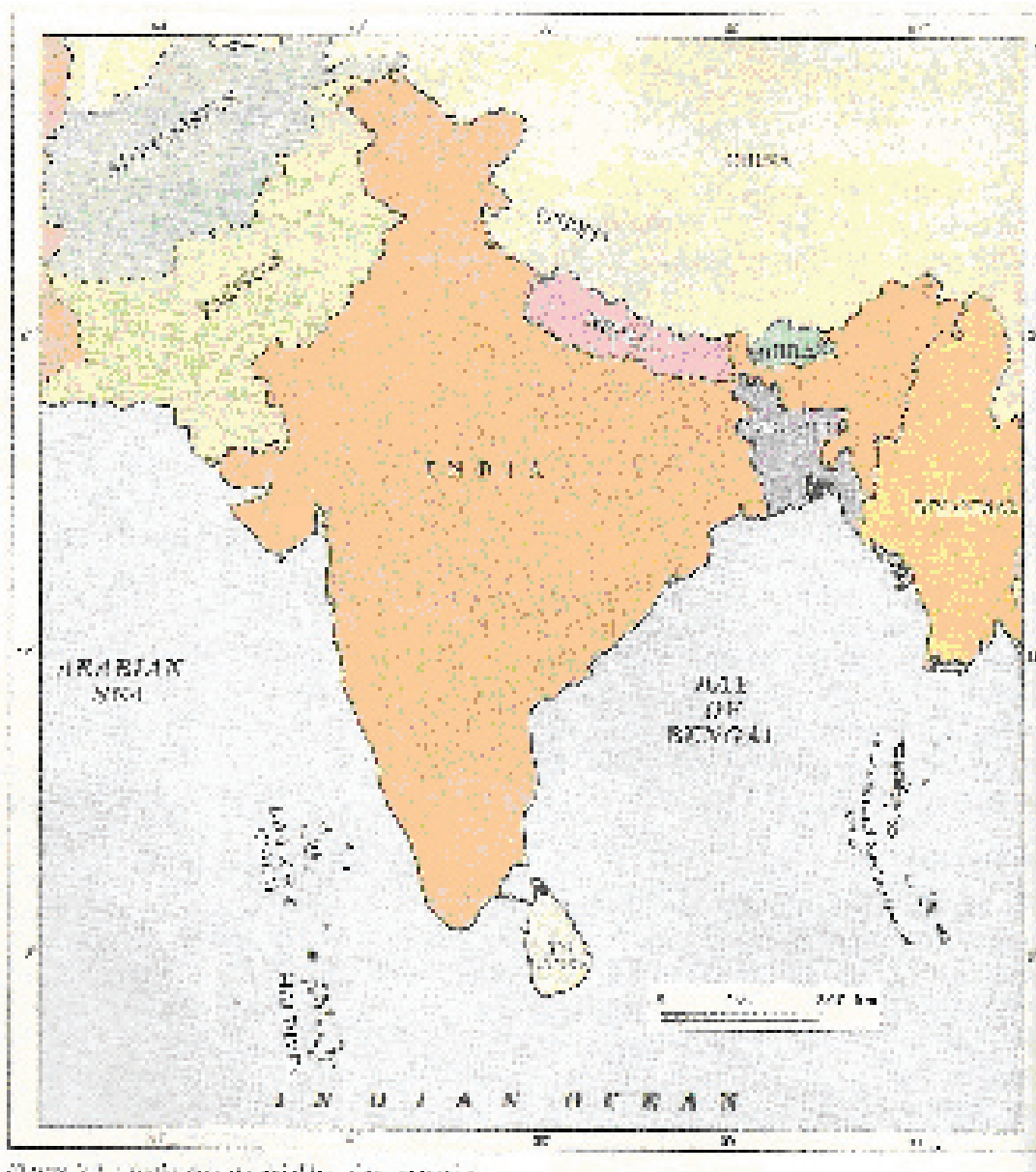
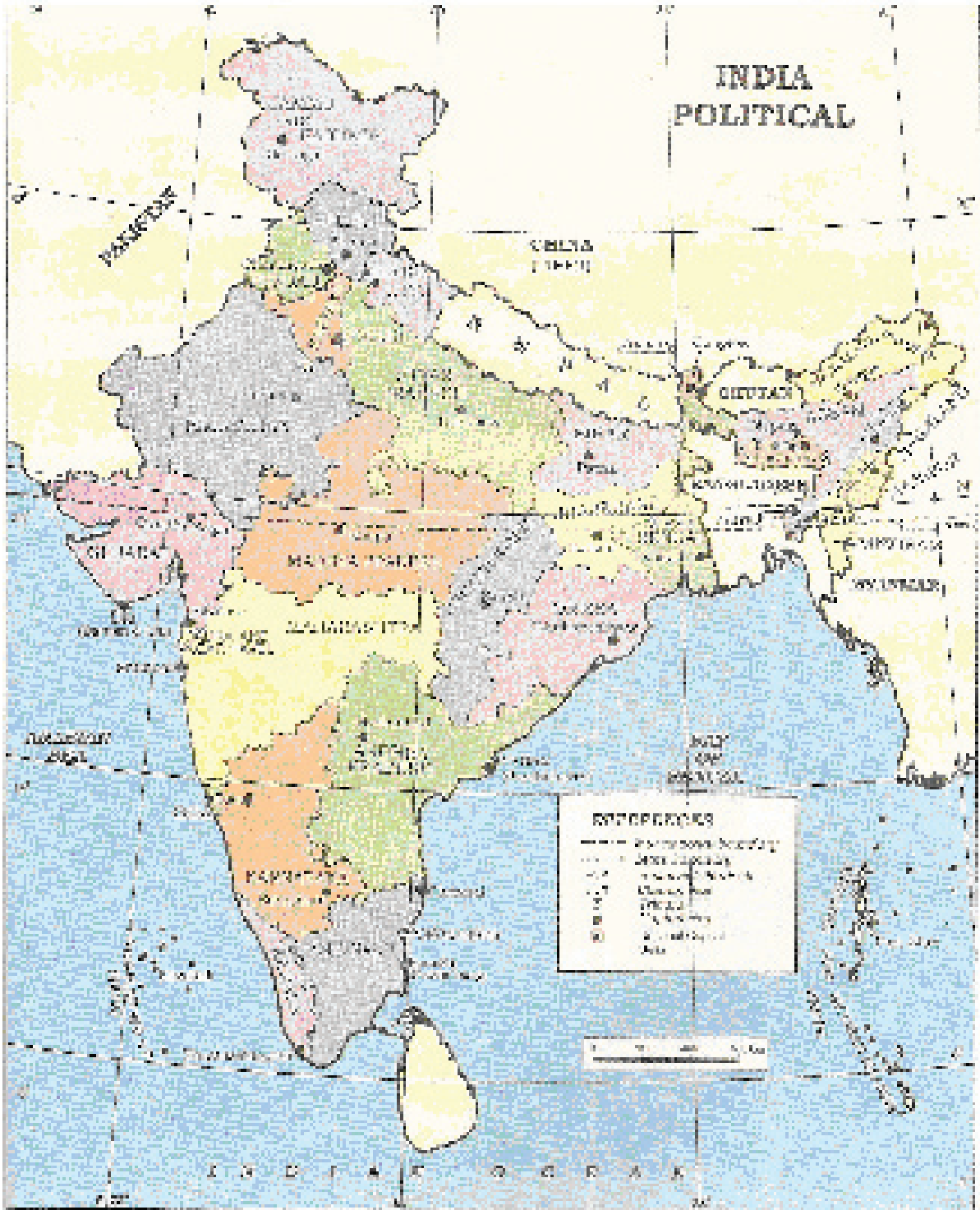


Figure 7.1 India and its land boundary countries

Our Country-India

Figure 22: Example of a γ -ray spectrum

POLITICAL AND ADMINISTRATIVE DIVISIONS

India is a vast country. For administrative purposes, the country is divided into 28 States and 7 Union Territories (Appendix-I). Delhi is the national capital. The states have been formed mainly on the basis of languages. Rajasthan is the largest state and Goa is the smallest state in terms of area. The states are further divided into districts.

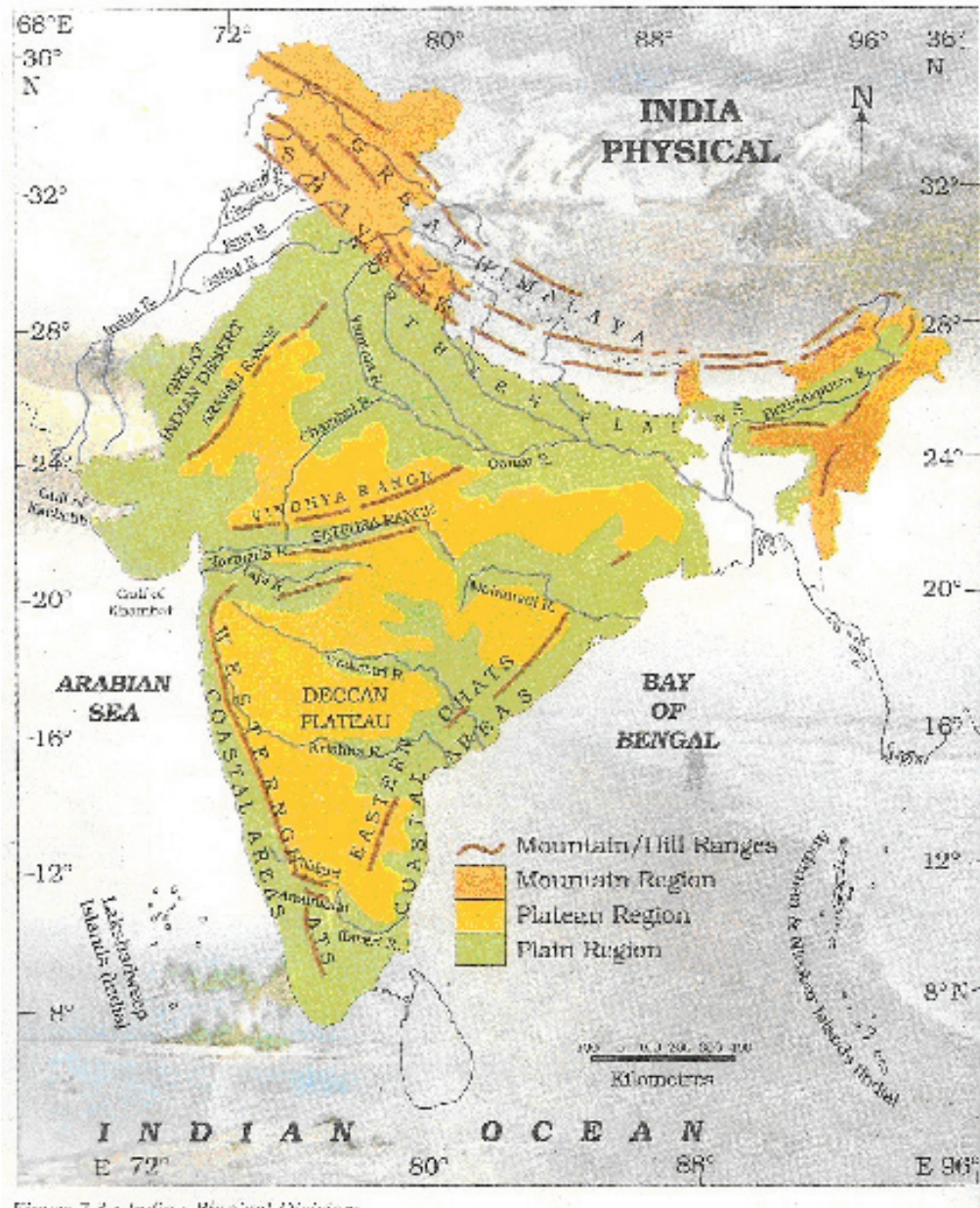


Figure 7.3 : India : Physical Divisions

Our Country-India

PHYSICAL DIVISIONS

India is marked by a diversity of physical features such as mountains, plateaus, plains, coasts and islands. Standing as sentinels in the north are the lofty snow-capped Himalayas. *Him+alaya* mean 'the abode of snow'. The Himalayan mountains are divided into three main parallel ranges. The northernmost is the **Great Himalaya** or **Himadri**. The world's highest peaks are located in this range. **Middle Himalaya** or **Himachal** lies to the south of Himadri. Many popular hill stations are situated here. Find out the names of five hill stations. The **Shiwalik** is the southernmost range.

Do you know?

The Ganga and the Brahma-putra form the world's largest delta, the Sunderban delta. The delta is triangular in shape. It is an area of land formed at the mouth of the river (where rivers enter into the sea, that point is called the mouth of the river, Figure 6.1).

The **Northern Indian plains** lie to the south of the Himalayas. They are generally level and flat. The alluvial deposits laid down by the rivers – the Indus, the Ganga, the Brahmaputra and their *tributaries*, form these. These river plains provide fertile land for cultivation. That is the reason for high concentration of population in these plains.

In the *western* part of India lies the **Great Indian desert**. It is a dry, hot and sandy stretch of land. It has very little vegetation.

To the south of northern plains lies the **Peninsular plateau**. It is triangular in shape. The relief is highly uneven. This is a region with numerous hill ranges and valleys. Aravali hills, one of the oldest ranges of the world, border it on the north-west side. The **Vindhyas** and the **Satpuras** are the important ranges. The rivers **Narmada** and **Tapi** flow through these ranges. These are west-flowing rivers that drain into the Arabian Sea. The **Western Ghats** or **Sahyadris** border the plateau in the west and the **Eastern Ghats** provide the eastern boundary. While the western Ghats are almost continuous, the Eastern are broken and uneven (Figure 7.3). The plateau is rich in minerals like coal and iron-ore.

To the West of the Western Ghats and the East of Eastern Ghats lie the **Coastal plains**. The western coastal plains are

Alluvial deposits :

These are very fine soils, brought by rivers and deposited in the river basins.

Tributary : A river or stream which contributes its water to a main river by discharging it into main river from either side (Figure 6.1).



Let's Do

Many girls are named after rivers e.g. Yamuna, Mandakini and Kaveri. Do you know anyone in your locality who is named after a river? Ask your parents and others and make a list of such names. Could you also find other names related to water e.g. Shabnam?



very narrow. The eastern Coastal plains are much broader. There are a number of east flowing rivers. The rivers **Mahanadi, Godavari, Krishna** and **Kaveri** drain into the Bay of Bengal. These rivers have formed fertile deltas at their mouth. The

Sunderban delta is formed where the Ganga and Brahmaputra flow into the Bay of Bengal.

Do you know?

Corals are skeletons of tiny marine animals called polyps. When the living polyps die, their skeletons are left. Other polyps grow on top of the hard skeleton which grows higher and higher, thus forming the coral islands. Figure 7.4 shows Coral islands.

Danger Waters

Down there in Sumatra started a big quake,
But no one had expected the Tsunami it did make,
Waves big as mountains like an army they charged,
And into the South Asian lands with all might
they barged.
Full with fury, they killed people in thousands,
And destroyed everything from buildings to farmlands.
The waves came and went from Sumatra to
other places,
And left nothing there except empty spaces.
People were left without shelter and food.
Tourists who had come decided they never should.
People lost their loved, near and dear ones,
Survivors snatched and fought for clothes and buns.
Relief to the affected was being sent out,
But now of disease there was a big hunt.
People feared going near the sea.
Could it swell up again giving no time to flee?
The fear installed in them may stay by the days.
But in this darkness of sorrow there's still a
happy ray!



Aparna Sinha
IX Std.



Vednath Swain
IV Std.

Our Country-India



Two groups of islands also form part of India, Lakshadweep Islands are located in the Arabian Sea. These are coral islands located off the coast of Kerala. The Andaman and the Nicobar Islands lie to the southeast of the Indian mainland in the Bay of Bengal. Do you know which group of islands were affected by the Tsunami in 2004? Find out through newspaper reports and by speaking to people how in different ways people faced this challenge when Tsunami struck the Indian coast. Tsunami is a huge sea wave generated due to an earthquake on the sea floor.



EXERCISES

1. Answer the following questions briefly.

- (a) Name the major physical divisions of India.
- (b) India shares its land boundaries with seven countries. Name them.
- (c) Which two major rivers fall into the Arabian Sea?
- (d) Name the delta formed by the Ganga and the Brahmaputra.
- (e) How many States and Union Territories are there in India? Which states have a common capital?
- (f) Why do a large number of people live in the Northern plains?
- (g) Why is Lakshadweep known as a coral island?

2. Tick the correct answers.

- (a) The southernmost Himalayas are known as
 - (i) Shiwaliks
 - (ii) Himadri
 - (iii) Himachal
- (b) Sahyadris is also known as
 - (i) Aravali
 - (ii) Western Ghats
 - (iii) Himadri
- (c) The Palk Strait lies between the countries
 - (i) Sri Lanka and Maldives
 - (ii) India and Sri Lanka
 - (iii) India and Maldives
- (d) The Indian islands in the Arabian Sea are known as
 - (i) Andaman and Nicobar
 - (ii) Lakshadweep Islands
 - (iii) Maldives

Our Country-India

- (e) The oldest mountain range in India is the
(i) Aravali hills (ii) Western Ghats (iii) Himalayas

3. Fill in the blanks.

- (a) India has an area of about _____.
(b) The Greater Himalayas are also known as _____.
(c) The largest state in India in terms of area is _____.
(d) The river Narmada falls into the _____ sea.
(e) The latitude that runs almost halfway through India _____.

Map Skills

1. On an outline map of the India, mark the following :
- (a) Tropic of Cancer
(b) Standard Meridian of India
(c) State in which you live.
(d) Andaman Islands and Lakshadweep Islands.
(e) Western Ghat and Eastern Ghat.

Chapter 7



INDIA: Climate, Vegetation and Wildlife

You read in newspapers daily and watch on T.V. or hear other talking about weather. You must know that **Weather** is about day to day changes in the atmosphere. It includes changes in temperature, rainfall and sunshine etc. For example, as such it may be hot or cold; sunny or cloudy; windy or calm. You must have noticed that when it is hot continued for several days you don't need any warm clothing. You also like to eat or drink cold things. In contrast there are days together, you feel cold without woollen clothes when it is verywindy and chilly, you would like to have something hot to eat.

Broadly, the major seasons recognised in India are

- Cold weather Season (Winter) December to February.
- Hot Weather Season (Summer) March to May.
- Southwest Monsoon Season (Rainy) June to September.
- Season of Retreating Monsoon (Autumn) October and November.

COLD WEATHER SEASON OR WINTER

During the winter season, cool, dry winds blow from north to the south. The sun rays do not fall directly in the region as a result, the temperature are quite low in northern India.

HOT WEATHER SEASON OR SUMMER

In the hot weather season sun rays more or less directly fall in this region. Temperature becomes very high. Hot and dry winds called **loo**, blow during the day.

Let's have fun :

1. People in all parts of our country drink delicious cool drinks called *Sharbat* made from fruits available in their regions. They are excellent thirst-quenchers and protect our bodies from the ill-effect of the harsh 'loo'. Have you tried 'Sharbat', made from raw mango, bel, lemon, tamarind, kokum, phalsa, watermelon and buttermilk made from curds; for example *chhaachhi*, *mattha*, *mori*, *chash*, etc? Many make banana and mango milkshakes too.
2. After a hot summer, the first rains bring much joy. All our languages have melodious songs on 'rains'. They sound happy and bring cheer. Learn two songs on rains and sing them together. Write or collect five poems on rains. Ask your friends, neighbours and family members for names for rains and other seasons in different languages. For instance,
Varsha - Hindi Pous - Marathi
Barish - Urdu Borsha - Bengali



INDIA: Climate, Vegetation and Wildlife

SOUTH WEST MONSOON OR RAINY SEASON

This season is marked by the onset and advance of monsoon. The winds blow from Arabian Sea and Bay of Bengal towards the land. They carry moisture with them. When these winds strike the mountain barriers, rainfall occurs.

SEASON OF RETREATING MONSOONS OR AUTUMN

Winds move back from the mainland to the Bay of Bengal. This is the season of the retreating monsoons. The southern parts of India, particularly Tamil Nadu and Andhra Pradesh receive rainfall in this season.

However, the **climate** is about the average weather condition, which have been measured over many years.

The climate of India has broadly been described as Monsoon type. **Monsoon** is taken from the Arabic word '**mausim**', which means seasons. Due to India's location in the tropical region, most of the rain is brought by monsoon winds. Agriculture in India is dependent on rains. Good monsoons mean adequate rain and a bountiful crop.

The climate of a place is affected by its **location, altitude, distance from the sea, and relief**. Therefore we experience regional differences in the climate of India. Jaisalmer and Bikaner in the desert of Rajasthan are very hot. While Drass and Kargil in Jammu and Kashmir are freezing cold. Coastal places like Mumbai and Kolkata experience moderate climate. They are neither too hot nor too cold. Being on the coast, these places are very humid. Mawsynram in Meghalaya receives the world's highest rainfall, while in a particular year it might not rain at all in Jaisalmer in Rajasthan.

What would happen if monsoons were weak, or even worse, failed to occur one year?

Tick the correct answer.

- Crop will be-
affected/ not affected
- The level of the water in a well will-
come-up/ go-down
- Summer will be-
longer/ shorter

Let's Do

On a map of India, locate the places mentioned in the paragraph.

NATURAL VEGETATION

We see a variety of plant life in our surroundings. How nice it is to play in a field with green grasses. There are also small plants called bushes and shrubs like cactus and flowering plants etc. Besides there are many tall trees some with many branches and leaves like neem, mango or palm. The grasses, shrubs and trees, which grow on their own without interference or help from human beings are called natural habitation. Do you wonder how these differ from each

other. Different types of natural vegetation are dependent on different climatic conditions, among which the amount of rainfall is very important.

TROPICAL RAIN FOREST

Tropical Rain Forests occur in the areas which receive heavy rainfall. They are so dense that sunlight doesn't reach the ground. Many species of trees are found in these forests, which shed their leaves at different times of the year. As a result, they always appear green and are called evergreen forest look at the Figure 8.1. Important trees found in these forests are *mahogany*, *ebony* and *rosewood*. Andaman and Nicobar Islands, parts of North-Eastern states and a narrow strip of the Western slope of the Western Ghats are home of these forests.

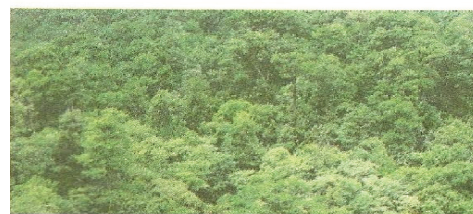
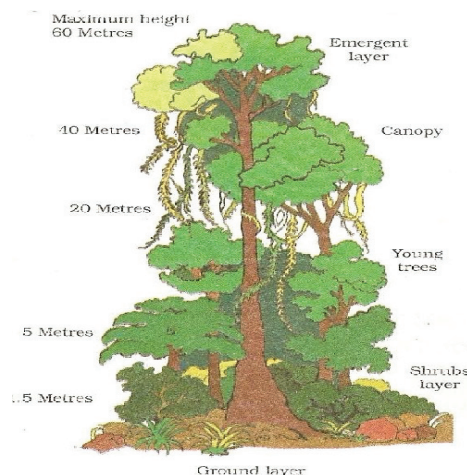


Figure 8.1 : Tropical Rain Forest

TROPICAL DECIDUOUS FORESTS

In a large part of our Country, we have this type of forest. These forests are also called monsoon forests. They are less dense. They shed their leaves at a particular time of the year. Important trees of these forests are sal, teak, peepal, neem and shisham. They are found in Madhya Pradesh, Uttar Pradesh, Bihar, Jharkhand, Chhattisgarh, Orissa, and in parts of Maharashtra.



Figure 8.2: Tropical Deciduous Forest

THORNY BUSHES

This type of vegetation is found in dry areas of the country. The leaves are in the form of spines to reduce the loss of water. Cactus,

khair, babool, keekar are important and are found in the state of Rajasthan, Punjab, Haryana, Eastern slopes of Western Ghats and Gujarat.



Figure 8.3: Thorny Bushes

MOUNTAIN VEGETATION

A wide range of species is found in the mountains according to the variation in height. With increase in height, the temperature falls. At a height between 1500 metres and 2500 metres most of the trees are conical in shape. These trees are called coniferous trees. Chir, Pine and Deodar are important trees of these forests and are also found in our State.



Figure 8.4: Mountain Vegetation

MANGROVE FORESTS

These forests can survive in saline water. They are found mainly in *Sunderbans* in West Bengal and in the *Andaman* and species of trees in Mangrove forests after which *Sunderbans* have been named *Nicobar Islands*. Sundari is a well-known.



Figure 8.5: Mangrove Forests

WHY ARE FORESTS NECESSARY?

Forest are very useful for us. They perform various functions. Plants release oxygen that we breathe and absorb Carbon dioxide. The roots of the plants bind the soil; thus, they control soil erosion.

Forests provide us with timber for furniture, fuel wood, fodder, medicinal plants and herbs, **lac**, honey, gum, etc.

Forests are the natural habitat of wild life.

Natural vegetation has been destroyed to a large extent because of the reckless cutting of trees. We should plant more trees and protect the existing ones and make people aware of the importance of trees. We can have special programmes like Van Mahotsav to involve more people in making our earth green.

Leela's parents planted a sapling of "neem" to celebrate her birth. On each birthday, a different sapling was planted. It was watered regularly and protected from severe heat, cold and animals. Children took care not to harm it. When Leela was 20, twenty one beautiful trees, stood in and around her house. Birds built their nests on them, flowers bloomed, butterflies fluttered around them, children enjoyed their fruits, swung on their branches and played in their shade.

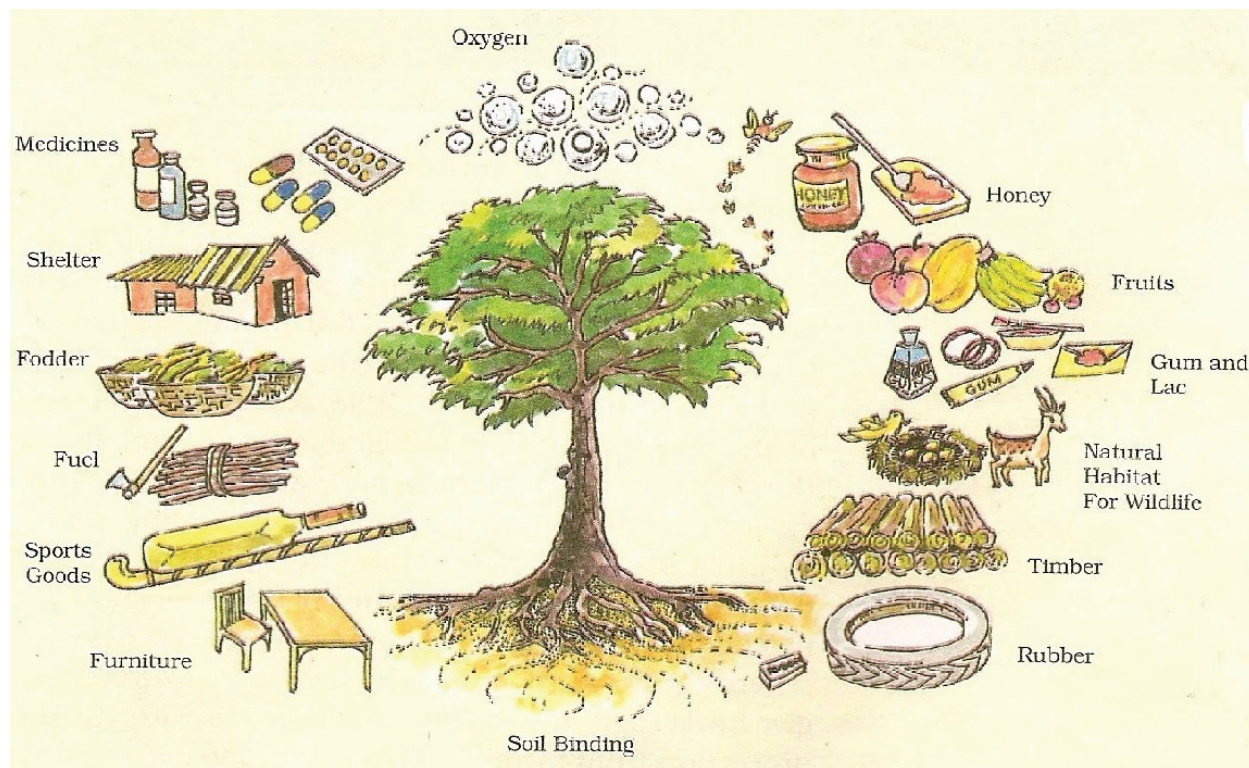


Figure 8.6: xxxxxx of herbs

INDIA: Climate, Vegetation and Wildlife

WILD LIFE

Forests are home to a variety of wild life. There are thousands of species of animals and a large variety of reptiles, amphibians, mammals, birds, insects and worms which dwell in the forest.

The tiger is our national animal. It is found in various parts of the country. Gir forest in Gujarat is the home of Asiatic lions. Elephants and one-horned rhinoceroses roam in the forests of Assam. Elephants are also found in Kerala and Karnataka. Camels and wild asses are found in the The Great Indian desert and the Rann of Kuchchh. Wild goats, snow leopards, bears, etc. are found in the Himalayan region. Besides these, many other animals are found in our country such as monkey, wolf, jackal, nilgai, **cheetal** etc.



Figure 8.7: Wild Life

India is equally rich in bird life. The peacock is our **national bird**. Other common birds are parrots, pigeons, mynah, geese, bulbul and ducks. These are several bird sanctuaries which have been created to give birds their natural habitat. These provide the birds protection from hunters. Can you name five birds that are commonly found in your area?

There are several hundreds of species of snakes found in India. Cobras and kraits are important among them.

Due to cutting of forests and hunting, several species of wildlife of India are declining rapidly. Many species have already become extinct.

In order to protect them many national parks, sanctuaries and biosphere reserves have been set up. The Government has also started Project Tiger and Project Elephant to protect these animals. Can you name some wildlife sanctuaries of India and locate them on a map?

Largescale poaching alleged in Simlipal reserve

J & K State Board of School Education

INDIA: Climate, Vegetation and Wildlife



EXERCISES

1. Answer the following questions briefly.

- (a) Which winds bring rainfall in India? Why is it so important?
- (b) Name the different seasons in India.
- (c) What is natural vegetation?
- (d) Name the different types of vegetation found in India.
- (e) What is the difference between evergreen forest and deciduous forest?
- (f) Why is tropical rainforest also called evergreen forest?

2. Tick the correct answers.

- (a) The world's highest rainfall occurs in
 - (i) Mumbai
 - (ii) Asansol
 - (iii) Mawsynram
- (b) Mangrove forests can thrive in
 - (i) saline water
 - (ii) fresh water
 - (iii) polluted water
- (c) Mahogany and rosewood trees are found in
 - (i) mangrove forests
 - (ii) tropical deciduous forests
 - (iii) tropical evergreen forests
- (d) Wild goat and snow leopards are found in
 - (i) Himalayan region
 - (ii) Peninsular region
 - (iii) Gir forests

(e) During the south west monsoon period, the moisture laden winds blow from

(i) land to sea

(ii) sea to land

(iii) plateau to plains

3. Fill in the blanks.

(a) Hot and dry winds known as _____ blow during the day in the summers.

(b) The states of Andhra Pradesh and Tamil Nadu receive a great amount of rainfall during the season of _____.

(c) _____ forest in Gujarat is the home of _____.

(d) _____ is a well-known species of mangrove forests.

(e) _____ are also called monsoon forest.

For Fun

1. Make a list of trees in your surroundings and collect the pictures of plants, animals and birds and paste them in your copy.
2. Plant a sapling near your home and nurture it and write down the changes you observe for a few months.
3. Does any migratory bird come in your locality? Try to identify that. Be watchful in winter season.
4. Visit a zoo in your city or visit a nearby forest or sanctuary with your elders. Watch various types of wildlife there.

States and Union Territories of India

State	Capital	Union Territory	Capital
Andhra Pradesh	Hyderabad	Andaman and Nicobar Islands	Port Blair
Arunachal Pradesh	Itanagar	Chandigrah	Chandigrah
Assam	Dispur	Dadra & Nagar Haveli	Silvessa
Bihar	Patna	Daman & Diu	Daman
Chhattisgarh	Raipur	Lakshadweep	Kavaratti
Goa	Panaji	Pondicherry	Pondicherry
Gujarat	Gandhi Nagar	National Capital Territory of Delhi	Delhi
Haryana	Chandigrah		
Himachal Pradesh	Shimla		
Jammu & Kashmir	Srinagar		
Jharkhand	Ranchi		
Karnataka	Bangalore		
Kerala	Tiruvnenentapuram		
Madhya Pradesh	Bhopal		
Maharashtra	Mumbai		
Manipur	Imphal		
Mehghalya	Shillong		
Mizoram	Aizawl		
Nagaland	Kohima		
Orissa	Bhubaneshwar		
Punjab	Chandigrah		
Rajasthan	Jaipur		
Sikkim	Gangtok		
Tamil Nadu	Chennai		
Utteranchal	Dehradun		
Utter Pradesh	Lucknow		
Tripura	Agartala		
West Bengal	Kolkata		