AS PER THE LATEST ICSE SYLLABUS

9

ICSE GEOGRAPHY

R K JAIN

Ratna Sagar

AS PER THE LATEST ICSE SYLLABUS

ICSE GEOGRAPHY

9

R K JAIN

Ratna Sagar

SYLLABUS

There will be one paper of two hours duration carrying 80 marks and Internal Assessment of 20 marks.

The questions paper will consist of Part I and Part II.

Part I (compulsory) will consist of two questions. Question 1 will consist of short answer questions from the entire syllabus and Question 2 will consist of a question based on World Map.

Part II Candidates will be required to choose any five questions.

Candidates will be expected to make the fullest use of sketches, diagrams, graphs and charts in their answers.

Questions may require answers involving the interpretation of photographs of geographical interest.

PRINCIPLES OF GEOGRAPHY

1. Our World

(i) Earth as a planet – shape of the Earth. Earth as the home of humankind and the conditions that exist.

(ii) Geographic grid – Latitudes and longitudes

(a) Concept of latitudes – main latitudes, their location with degrees, parallels of latitude and their uses.

(b) Concept of longitudes – Prime Meridian, time (local, standard and time zones), Greenwich Mean Time (GMT) and International Date Line (IDL), Eastern and Western hemisphere

(c) Using latitudes and longitudes to find location, Calculation of time.

(d) Great Circles and their use.

(iii) Rotation and Revolution

Rotation – direction, speed and its effects (occurrence of day and night, the Sun rising in the east and setting in the west, Coriolis effect)

Revolution of the Earth and inclined axis – effects: the variation in the length of the day and night and seasonal changes with Equinoxes and Solstices.

2. Structure of the Earth

(i) Earth's structure

Core, mantle, crust – meaning, exgtent and their composition.

(ii) Landforms of the earth – mountains, plateaus plains (definition, types and their formation):

Mountains – fold, residual and block.

Plateaus – intermont and volcanic.

Plains – structural and depositional.

Examples from the world and India.

(iii) Rocks – difference between minerals and rocks; types of rocks – igneous, sedimentary, metamorphic, their characteristics and formation; rock cycle

(iv) Volcanoes – meaning; Types – active, dormant and extinct; Effects – constructive and destructive;

Important volcanic zones of the world.

(v) Earthquakes – meaning, causes and measurement; Effects – destructive and constructive; Earthquake zones of the world

(vi) Weathering and Denudation – meaning, types and effects of weathering; Types – Physical weathering – block and granular disintegration, exfoliation; Chemical weathering – oxidation, carbonation, hydration and solution; Biological weathering – caused by humans, plants and animals; Meaning and agents of denudation; Work of river and wind; Stages of a river course and associated land forms – V-shaped valley, waterfall, meander and delta; Wind – deflation hollows and sand dunes.

3. Hydrosphere

Meaning of hydrosphere; Tides – formation and pattern; Ocean currents – their circulation pattern and effects (Specifically of Gulf Stream, North Atlantic Drift, Labrador Current, Kuroshio and Oyashio).

4. Atmosphere

(i) Composition and structure of the atmosphere – Troposphere, Stratosphere, Ionosphere and Exosphere; Ozone in the stratosphere, its depletion; Global warming and its impact.

(ii) Insolation – Meaning of insolation and terrestrial radiation; Factors affecting temperature – latitude, altitude, distance from the sea and slope of the land, winds and ocean currents.

(iii) Atmospheric pressure and winds – Meaning and factors that affect atmospheric pressure; Major pressure belts of the world; Factors affecting direction and velocity of wind – pressure gradient, Coriolis Effect; Permanent winds – Trades, Westerlies and Polar Easterlies; Periodic winds – land and sea breezes, monsoons; Local winds – Loo, Chinook, Foehn and Mistral; Variable winds – Cyclones and anticyclones; Jet streams – Meaning and importance

(iv) Humidity – meaning and difference between relative and absolute humidity; Condensation – forms (clouds, dew, frost, fog and mist); Precipitation – forms (rain, snow, and hail); Types of rainfall – relief/orographic, convectional, cyclonic/frontal with examples from the different parts of the world.

5. Pollution

a. Types of pollution – air, water (fresh and marine), soil, radiation and noise

b. Sources

Noise – Traffic, factories, construction sites, loudspeakers, airports; Air – vehicular, industrial, burning of garbage; Water – domestic and industrial waste; Soil – chemical fertilizers, biomedical waste and pesticides; Radiation – X-rays, radioactive fallout from nuclear plants.

c. Effects – on the environment and human health

d. Preventive measures – Car pools, promotion of public transport, no smoking zone, restricted use of fassil fuels, saving energy and encouragement of organic farming.

6. Natural regions of the World

Location, area, climate, natural vegetation and human adaptation

Equatorial region, tropical grasslands, Tropical Deserts, Tropical Monsoon, Mediterranean, Temperate grasslands, Taiga and Tundra.

7. Map Work

On an outline map of the world, candidates will be required to locate, mark and name the following:

1. The major natural regions of the world – Equatorial, Tropical Monsoon, Tropical Deserts, Mediterranean type, Tropical grasslands, temperate grasslands, Taiga and Tundra.
2. The Oceans, Seas, Gulfs and Straits – all Major Oceans, Caribbean Sea, North Sea, Black Sea, Caspian Sea, South China Sea, Mediterranean Sea, Gulf of Carpentaria, Hudson Bay, Persian Gulf, Gulf of Mexico, Gulf of Guinea, Bering Strait, Strait of Gibraltar, Strait of Malacca.
3. Rivers – Mississippi, Colorado, Amazon, Parana, Paraguay, Nile, Zaire, Niger, Zambezi, Orange, Rhine, Volga, Danube, Murray, Darling, Hwang Ho, Yangtse Kiang, Ob, Indus, Ganga, Mekong, Irrawaddy, Tigris, Euphrates.
4. Mountains – Rockies, Andes, Appalachian, Alps, Himalayas, Pyrenees, Scandinavian Highlands, Caucasus, Atlas, Drakensburg, Khinghan, Zagros, Urals, Great Dividing Range.
5. Plateaus—Canadian shield, Tibetan plateau, Brazilian highlands, Patagonian plateau, Iranian plateau, Mongolian plateau.

INTERNATIONAL ASSESSMENT
PRACTICAL WORK/PROJECT WORK

1. A record file having any three of the following exercises will be maintained. (the file will be evaluated out of 10 marks).

a. Uses of important types of maps.

b. Directions and how to identify them - an illustrative diagram.

c. Reading and using statement of scale, graphic scale and scale shown by representative fraction method. (No drawing work, only explaining their meanings).

d. Reading of one town guide map or an atlas map. (Recognizing the symbols and colours used, identifying directions and distances).

e. Drawing and recognizing forms of important contours viz., valleys, types of slopes, conical hill, plateau, escarpment and sea cliff.

f. Drawing at least one sketch map to organize information about visiting an important place, a zoo or a monument.

2. Candidates will be required to prepare a project report on any one topic. the topics for assignments may be selected from the list of suggested assignments given below. Candidates can also take up an assignment of their choice under any of the four broad areas given below. (the project will be evaluated out of 10 marks).

Suggested list of Assignments

a. Weather records: Maintaining and interpreting weather records as found in the newspaper for at least one season.

b. Collection of data from secondary sources (Using Modern techniques i.e. GPS, remote Sensing, Aerial Photography and Satellite imageries): Preparing a PowerPoint presentation on current issues like – use of Earth resources/development activities/dangers of development and ecological disasters like droughts, earthquakes, volcanoes, floods, landslides cyclones and tornadoes in the world.

c. Physical Features: Collection of data from primary and secondary sources or taking photographs and preparing national sketches of features found in the vicinity or areas visited during the year as a part of school activity.

d. Find out the sources of pollution of water bodies in the locality and determine the quality of water.

e. Collect information on global environmental issues and problems and communicate your findings through appropriate modes (posters, charts, collages, cartoons, handouts, essays, street plays and PowerPoint presentation).

f. Area Studies: Choosing any aspect from Section B (World Studies) and preparing a PowerPoint presentation or a write up on it.

g. Meteorological Instruments and their uses – six's maximum and minimum thermometer, mercury barometer, aneroid barometer, wind vane, anemometer, rain gauge and hygrometer.

INTERNAL ASSESSMENT IN GEOGRAPHY – GUIDELINES FOR MARKING WITH GRADES

Criteria	Preparation	Procedure/ Testing	Observation	Inference/Results	Presentation
Grade I (4 marks)	Gives complete theoretical information using relevant geographical terms	States the objectives and defines the aspects to be studies.	Studies text and source material and makes a list.	States theoretical information in a coherent and concise manner using geographical terminology. Uses a variety of techniques. Shows resourcefulness. Supports investigation with relevant evidence.	Neatly and correctly stated statement of intent and conclusion matches with objectives.
Grade II (3 marks)	Provides adequate information using appropriate terms.	States objectives but not the limitations of the study.	Makes a limited list of source material only from secondary sources.	Uses sound methodology-using methods suggested. Makes a valid statement about the data collected. Attempts to develop explanation using available information.	Limited use of reference material and a presentation, which is routine.
Grade III (2 marks)	State objectives using some geographical terms but mostly in descriptive terms.	Only lists the aspects to be studied.	References are minimal.	Uses methodology in which selective techniques are applied correctly. Makes descriptive statement. Analysis is limited. Relates and describes systematically the data collected. Tries to relate conclusion to original aim.	Simple and neat with correct placement of references, acknowledgments, contents, maps and diagrams.
Grade IV (1 marks)	State intent without using relevant geographical terms but explaining them correctly.	Shows evidence of what to look for and how to record the same.	Uses mythology with some techniques but is unable to systematically record data and collect information.	Makes few relevant statements. Does analyze data that is not presented or tends to copy analysis available from other sources. Makes superficial conclusions. Link between the original aim and conclusion is not clear.	Neat but lacking in correct placement of table of contents, maps, diagrams and pictures.
Grade V (0 marks)	Does not make any use of geographical terms.	Has not collected any relevant data and has not presented sources correctly.	Does not use any logical technique and does not follow the methodology suggested.	Does not analyze data. Does not use the suggested methods. Makes conclusions but does not relate them to the original aim.	Presents the report without reference.

CONTENTS

The Earth as a Planet

1

COURSE CONTENT – Syllabus and Focus

Shape of the Earth, Earth as the home of humankind and the conditions that exist.

We use the term **universe** for everything that exists in space. Most of the scientists believe that the origin of universe was due to the **Big Bang** which occurred about 20 billion years ago. The universe has countless number of **galaxies**. The cluster of stars in the sky is called a galaxy. Each galaxy in the universe has billions of stars. Our Sun is a **star** and we can see about 6000 stars from the Earth at a time. They all belong to a galaxy, called the **Milky Way galaxy** or the **Aakash Ganga**.

THE SOLAR SYSTEM

The stars are huge in size and are made up of very hot gases. They look very small as they are very far from us. The Sun looks comparatively bigger as it is very close to the Earth. The Sun has a family, which is called the **Solar System**. The main members of the Solar family are the planets, satellites, asteroids, comets and meteors. All the members of the Solar family stay together due to the strong pull of Sun's gravity.

Did You Know?

We notice some dark spots on the surface of Sun. These areas have comparatively lower temperature than the surface of Sun. These spots look dark as they are cooler and are called the **Sunspots**.

THE SUN AS A STAR

The Sun is the largest member of the Solar System and is a huge ball of very hot gases. The diameter of the Sun is about 1,392,000 km, which is 109 times greater than that of the Earth. The Sun is about 1.3 million times bigger than the Earth. It is located at an average distance of about 148 million km from the Earth. It is the main source of heat and light for all forms of life on the Earth.

The light from the Sun, travelling at a speed of about 300,000 km per second, takes about 8 minutes and 20 seconds to reach the surface of the Earth.

THE PLANETS

The planets are important members of the Solar System. There are eight planets in the Solar System. In order of their distance from the Sun, these are – Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus

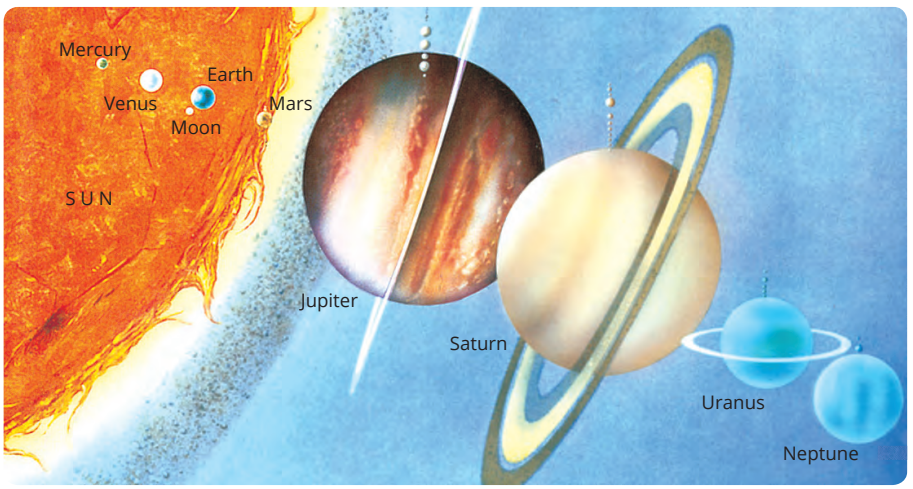


Fig. 1.1 The planets of the Solar System

and Neptune (See Fig. 1.1). All the planets rotate on their axes and also revolve around the Sun from west to east, i.e. in the anti-clockwise direction. The path of revolution around the Sun is fixed and is called the **orbit**. All planets except Mercury and Venus have satellites, also called moons. The planets do not have their own light, but reflect the light of the Sun.

The planets in the Solar System are generally placed in the following two groups:

1. **The Inner Planets** include Mercury, Venus, Earth and Mars. These are also called the **terrestrial planets**, as their structure is similar to that of the Earth.
2. **The Outer Planets** include Jupiter, Saturn, Uranus and Neptune. These are also called the **Jovian planets**, as their structure is similar to that of the Jupiter. They are of gaseous origin.

EARTH – A UNIQUE PLANET

In the Solar System, Earth is the third planet from the Sun. It is the fifth largest planet and is called the living planet. Earth is the home of humankind. The Earth is a unique planet and its uniqueness is due to the following reasons.

1. The Earth lies between Venus and Mars. The Earth is located at an average distance of about 148 million km from the Sun. It is considered as the optimum location in the Solar System. Among the other seven planets, those near the Sun are too hot and those away from the Sun are too cold to sustain life.
2. The average temperature on the side which is facing the Sun is about 17 °C. In comparison, the day temperature at Mercury (the nearest planet to the Sun) is as high as 400 °C and on Mars, it ranges between 20 °C and –140 °C. Even a minor change in the distance of the Earth from the Sun, would have made it either too cold or too hot for the survival of living organisms.
3. Life exists on the Earth due to the presence of land, water and air. These three domains represent the three states in which matter can exist–solid, liquid and gas. The narrow zone of contact between land, water and air has conditions where all forms of life exist.
4. The Earth has a favourable environment, which is due to the favourable living conditions. The Earth has optimum conditions for the origin, growth and survival of various forms of life. If the heat energy received from the Sun (insolation) increases or decreases by about 10 per cent, then a very large part of the Earth would become unsuitable for the living organisms.
5. Due to the rotation of the Earth around its axis, the part of the Earth facing the Sun constantly gains heat due to insolation and the part of the Earth away from the Sun constantly loses heat due to terrestrial radiation towards the outer atmosphere. This helps in keeping the extremes of temperature between day and night well within tolerable limits.
6. The presence of water is a unique feature of our planet. The area under land and water on the surface of the Earth is about 29 per cent and 71 per cent respectively. Water is found in oceans, seas, gulfs, bays, lakes, rivers, etc. The water is continuously moving from the Earth's surface into the atmosphere and back again to the Earth's surface through the **hydrological cycle**. This maintains

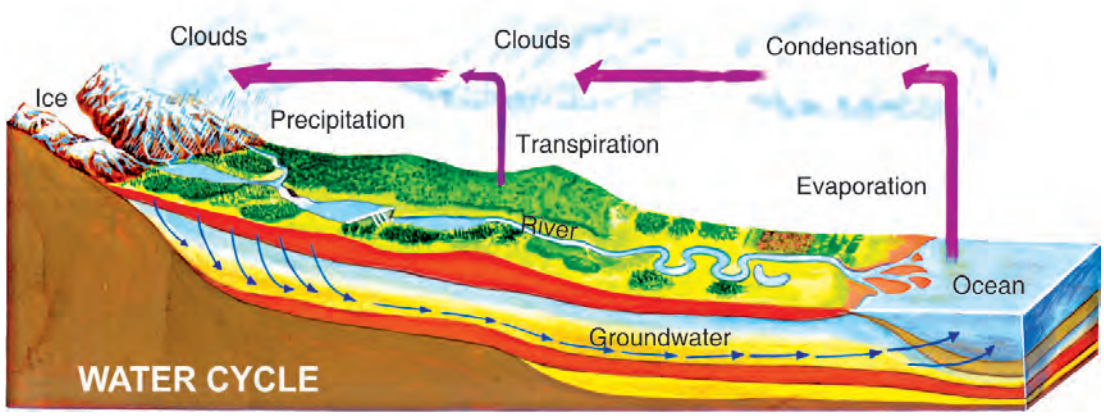


Fig. 1.2 The hydrological cycle

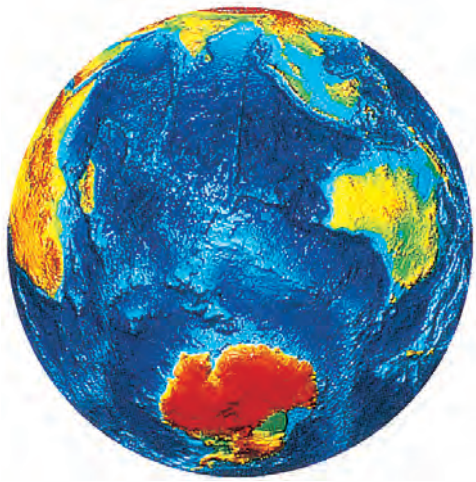


Fig. 1.3 Earth – The Blue Planet

the continuous flow of water on the Earth. The presence of adequate amount of water on Earth provides ideal conditions for the origin, growth and development of various life forms.

7. The presence of atmosphere around the Earth has made it a unique planet. The main gases present in the atmosphere are nitrogen (78 per cent) and oxygen (21 per cent). The lower layers of the atmosphere have adequate amount of oxygen, which is needed for breathing by human beings and other living organisms. Nitrogen and carbon dioxide are needed by plants for their growth. Thus, the presence of atmosphere around the Earth has made life possible on it.
8. The atmosphere also acts as a shield and protects the planet from harmful **ultraviolet rays** coming from the Sun. These rays are not able to reach the Earth's surface due to the presence of **ozone layer** in the atmosphere. The atmosphere also absorbs the radiations from the Earth's surface. This helps in keeping the Earth comparatively warmer during the night time and also during the winter season.

Did You Know?

When astronauts from the Earth, for the first time, landed on the surface of Moon, they watched the Earth from there, as no one had ever seen it before. It looked blue in colour due to the presence of water all over it. Thus the Earth is popularly known as the **blue planet** or the **watery planet**.

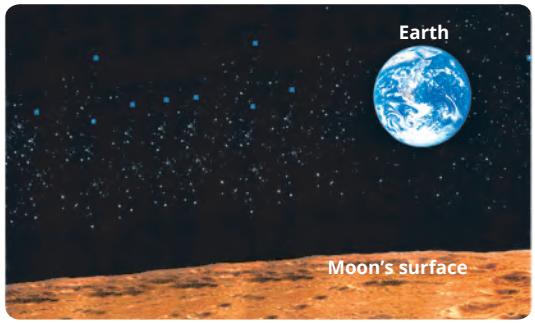


Fig. 1.4 Earth as seen from the Moon's surface

THE SHAPE OF THE EARTH

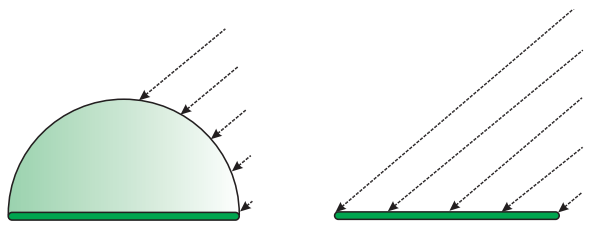
In ancient times, people believed that the shape of the Earth was flat like a disc and it had steep edges. People feared that they would fall off the edge. Today we know that the Earth is spherical in shape. But it is not a perfect sphere, as it is **bulging at the Equator and flattened at the Poles**.

The famous Greek philosopher **Pythagoras**, in the sixth century BC, said that the Earth was spherical in shape. But people did not believe him. Later on, Aristotle, Varahamihira, Aryabhata and Copernicus also said that the Earth is spherical in shape.

Today we have several convincing proofs to support the spherical shape of the Earth. Some of them are:

1. **The Sun and other planets:** In the Solar System all the heavenly bodies are spherical in shape. The Earth cannot be an exception. Thus, the Earth should also be spherical in shape.

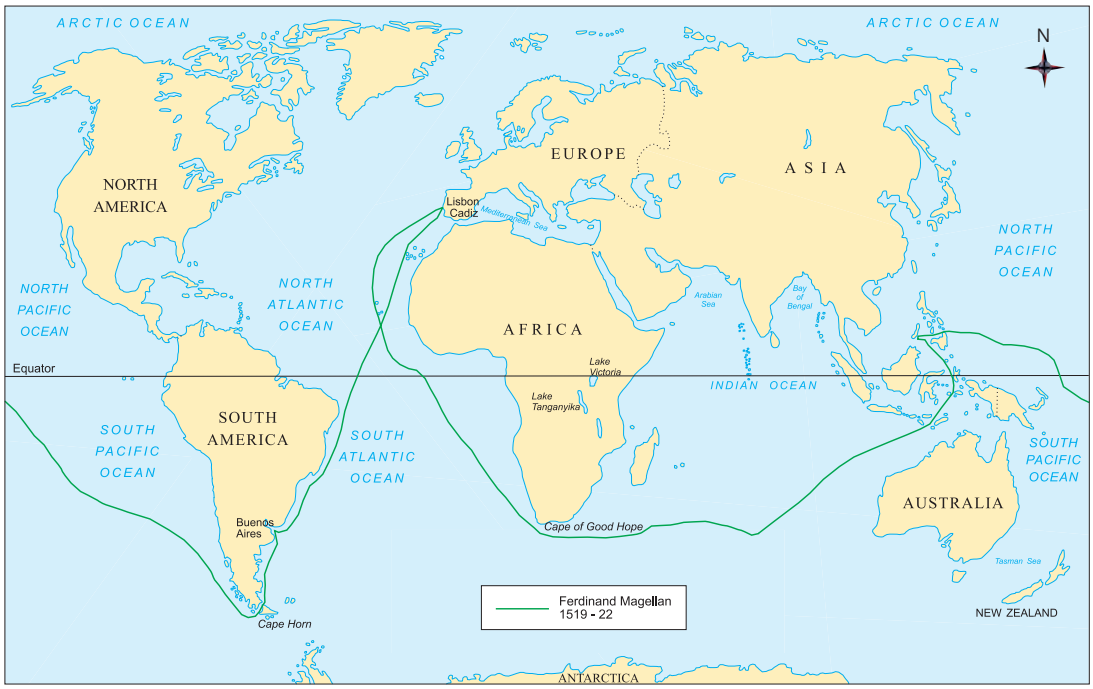
2. **The Sunrise and the Sunset:** We know that Sun rises in the east and sets in the west. The time of sunrise and sunset is not the same at different places on the Earth. As the Earth rotates around its axis from west to east, people living in the eastern areas see the sunrise earlier than those living in the west. Had the Earth been flat in shape, then all places on the flat Earth would have sunrise and sunset exactly at the same time.



On a spherical Earth the rising Sun will be first seen in the east and then in the west.

On a flat Earth the rising Sun can be seen at all places at the same time.

Fig. 1.5



Map 1.1 Route of Magellan for round-the-world voyage

3. **The Circular Horizon:** If we look around from any place, whether a hill top or from a tall building, the edges of the Earth (or the horizon) look circular in shape. The extent of this circular horizon increases with the increase in altitude of the observer. This is possible only in the case of a spherical body. Had the shape of the Earth been flat, the extent of visible area and its horizon would remain the same, irrespective of increase or decrease in the altitude of the observer.

4. **The Circular Shadow:** The basis of Aristotle's belief about the spherical shape of the Earth, was its circular shadow (as an arc of a circle) observed during the lunar eclipse. A circular shadow can only be cast by a spherical body.

5. **The Sighting of a Ship:** While standing on the sea coast, if we watch a ship approaching the land, first we will see the smoke coming out of the chimney of the ship (because the entire ship lies below the line of sight). As the ship comes up over the horizon, we can see the chimney, then deck and finally the entire ship. This is due to the curved surface of the Earth. Had the Earth been flat, then we could see the whole ship at a time.

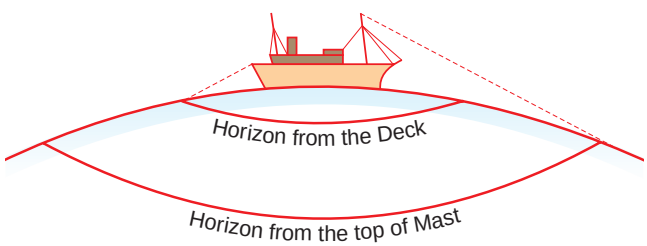


Fig. 1.6 The extent of visible sea increases with height.

6. **The Pole Star:** The position of the Pole Star is always vertically above the North Pole. The angle of elevation of the Pole Star is different at different places. This angle decreases towards the Equator, where it is 0°. This is possible only if the Earth is spherical in shape. Had the Earth been flat in shape, then the Pole Star would have been overhead (at 90°) at all places on the flat surface of the Earth.

7. **The Circumnavigation:** We know that sailors have been travelling around the world in different directions and almost all of them came back to the starting point. In the early years of the sixteenth century, **Ferdinand Magellan**, a Portuguese navigator and explorer, went on a voyage and discovered the Strait of Magellan. He sailed across the Pacific Ocean. Though he was killed in the Philippines, but his ship **Victoria** continued westwards and finally completed the voyage around the world and proved that the Earth is spherical in shape.

8. **The Bedford Canal Experiment:** The most convincing proof about the shape of the Earth was

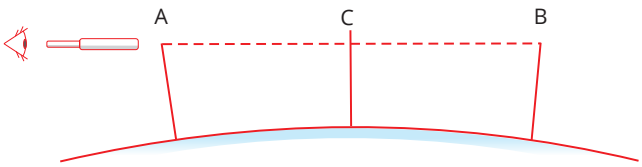


Fig. 1.7 The Bedford level canal experiment proved the curvature of the Earth.

given by **Dr Wallace**, a Britisher, who carried out an experiment in the **Bedford canal** area in England. He fixed three poles of equal length on the level bed of the Bedford canal at a distance of one mile or 1.6 km apart from the other. It was ensured that the three poles had the same height above the water in the canal. Dr Wallace observed the top parts of these poles with the help of a telescope. He found that the middle pole was higher by about eight inches or 20 cm (See Fig. 1.7). This experiment was repeated in several other directions and at different places. It proved beyond doubt that the surface of the Earth is curved and the Earth is spherical in shape.

9. **Recent Photographs of the Earth:** Nowadays, the orbiting satellites have taken photographs from different situations. We can see the Earth in the true perspective in these photographs taken from outer space. This is a confirmed proof about the spherical shape of the Earth.

The actual measurements of the Earth have revealed that the Earth is not a perfect sphere. It has been found that the Earth is slightly bulging at the Equator and slightly flattened at the Poles. This shape of the Earth is called **Oblate Spheroid**. The Polar diameter of the Earth is about 12,714 km, while the Equatorial diameter

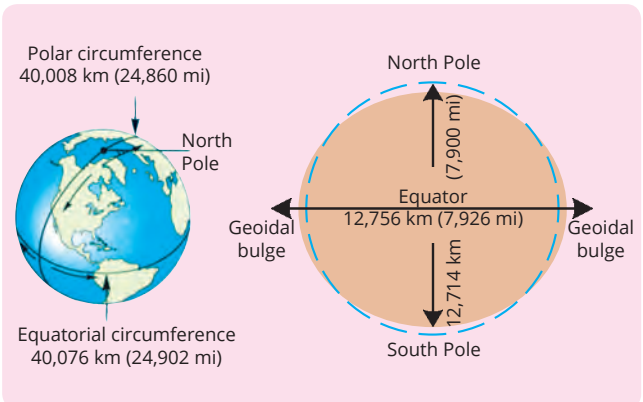


Fig. 1.8 Earth is an Oblate Spheroid.

Facts About the Earth

1.	Equatorial Diameter	12,756 km
2.	Polar Diameter	12,714 km
3.	Mean Radius of the Earth	6,367 km
4.	Equatorial Circumference	40,077 km
5.	Polar circumference	40,009 km
6.	Total Surface Area	511 million sq km
7.	Total Mass	5,378 billion cubic tons
8.	Total Volume	1,083 billion cubic km
9.	Rotation Period	About 23 hours 56 minutes
10.	Orbital Period	About 365 days 6 hours
11.	Average Density	5.29 g per cubic cm
12.	Average Surface Temperature	About 17°C

is about 12,756 km. The difference between the Polar and the Equatorial diameters is only about 42 km. This difference is due to the centrifugal force caused by the Earth's rotation. In comparison to the size of the Earth, this difference of about 42 km between the Polar and the Equatorial diameters is insignificant. Thus the Earth is taken as spherical in shape for all practical purposes.

THE EARTH AS THE HOME OF HUMANKIND

Earth is the only planet in the Solar System which is known to have life, and this is due to the presence of land, water and air on it. These three domains of the Earth are called the **lithosphere**, the **hydrosphere** and the **atmosphere** respectively. The solar energy from the Sun keeps these three domains together.

The narrow zone of contact between land, water and air, where all forms of life exist, is called the **Biosphere**. It includes all the three domains of the Earth with all their biotic (living) and abiotic (non-living) components. Biosphere is the home for the entire living organisms on our Earth.

The layer of the biosphere, where all organisms live, is about 15 km thick from the highest mountain peak to the deepest ocean trench. Compared to the total size of the Earth, the extent of the biosphere is very small. It is estimated that about 1.5 million different species of organisms are living in the biosphere. Most of these organisms exist only in the lower portion of the atmosphere.

The biosphere provides all the nutrients and resources which the living organisms need to survive. Every organism in the biosphere is influenced by and in turn influences the biotic (living) and abiotic (non-living) components of biosphere through numerous modes of interactions.

Life in the biosphere is found in plant kingdom and animal kingdom. Human beings are also part of a biosphere. Many human activities have a negative impact on the biosphere. It has been realized that we must conserve (use without abuse) the resources of the biosphere, and co-exist peacefully with other organisms.

At A Glance

- The universe probably originated due to the Big Bang, which happened about 20 billion years ago.
- Our Sun is a star and it belongs to the Milky Way or the Aakash Ganga galaxy.
- The main members of the Solar System are Sun, planets, satellites, asteroids, comets, meteors, etc.
- The Solar family stays together due to the strong gravitational pull of the Sun.
- The Sun is the main source of heat and light for all forms of life on the Earth.
- The sunrays take about 8 minutes and 20 seconds to reach the Earth's surface.
- The eight planets in the Solar System are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
- The Earth rotates on its axis and revolves around the Sun in a fixed path called orbit.
- All the planets revolve around the Sun in anti-clockwise direction, i.e. from west to east.
- Dr Wallace of England conducted the Bedford Canal experiment.
- The shape of the Earth is spherical. It is bulging at the equator and flattened at the poles.
- Due to several reasons the Earth is considered as a unique planet in the Solar System.
- Earth has a favourable environment for the origin, growth and survival of various forms of life.
- The narrow zone of contact between land, water and air, where all forms of life exist is called biosphere.
- The process of water cycle has no beginning or end, but has a continuous circulation.

Exercises

A. Fill in the blanks.

1. The origin of the universe is probably due to the ..... theory.
2. The Solar System belongs to the ..... galaxy.
3. All the planets revolve around the Sun in the ..... direction.
4. The equatorial diameter of the Earth is about ..... km.
5. The speed of light coming from the Sun is ..... km per second.

B. Explain the following terms:

1. Universe
2. Planet
3. Galaxy
4. Solar System
5. Star
6. Water Cycle.

C. Answer the following questions very briefly.

1. Name the planets in the Solar System in order of their distance from the Sun.
2. How much time is taken by the light from the Sun to reach the Earth?

3. Which layer of the atmosphere protects us from the harmful ultravoilet rays?
4. Who conducted the Bedford Canal experiment in England?
5. What is Milky Way Galaxy?

D. Given reasons for each of the following.

1. The Earth is not a perfect sphere.
2. Biosphere is a functional unit of nature.
3. The Sun looks bigger than the other stars in the sky.
4. The Earth is the home of humankind.
5. The Earth is often called the Blue Planet.

E. Answer the following questions briefly.

1. What is the importance of Sun for life on the Earth?
2. How is the Earth located at an optimum distance from the Sun?
3. Name the ancient scholars and philosophers, who felt that the Earth is spherical in shape.
4. How does Pole Star and horizon help in finding the shape of the Earth?
5. Name the inner and the outer planets in the Solar System.

F. Answer the following questions.

1. Explain the Bedford Canal experiment for finding the shape of the Earth.
2. Explain at least three reasons to prove that the Earth is a unique planet.
3. What is the significance of ozone layer in the atmosphere?
4. How can a sailing ship and circumnavigation help in finding the shape of the Earth?
5. What is importance of Sun in the Solar System?

G. Project.

Find out some details about the Big Bang Concept.

2 The Geographic Grid – Latitudes and Longitudes

COURSE CONTENT – Syllabus and Focus

Concept of latitudes – main latitudes, their location with degrees, parallels of latitude and their uses
Concept of longitudes – Prime Meridian, time (local, standard and time zones), Greenwich Mean Time (GMT) and International Date Line (IDL), Eastern and Western hemispheres
Using latitudes and longitudes to find location. Calculation of time
Great Circles and their uses

The most convincing proof about the shape of the Earth has been given by the pictures taken from the space by the astronauts and the orbiting satellites. The actual measurements proved that the Earth is not a perfect sphere, as its equatorial diameter is bigger than its polar diameter. However, this difference is so small, that for all practical purposes, we consider the shape of the Earth as a **sphere**.

THE GEOGRAPHIC GRID

A ball can truly represent the spherical Earth. It neither has a top or a bottom nor has sides or corners. Imagine the difficulty of trying to describe the location of a particular point on a perfectly round ball.

We need some system for locating places accurately. The simplest way is to design two sets of lines that intersect at right angles. Such a network of vertical and horizontal lines is referred to as the **grid system** (See Fig. 2.2).

- In order to know the location and direction of a place on the Earth's surface, we have to develop some technique.
- We know that the Earth rotates on its own axis, and the end points of this imaginary axis are called the **North Pole** and the **South Pole**.
- The poles are taken as fixed points on the surface of the Earth and can be used as reference points for developing a system for locating places on the Earth.
- If we visualise a plane passing through the Earth halfway between the North Pole and the South Pole, and perpendicular to the axis of the Earth, we get another valuable reference, i.e. the **Equator**.
- It divides the Earth into two equal parts or hemispheres. The part of the Earth which is towards the north of equator is called the **Northern Hemisphere** and the other portion which is

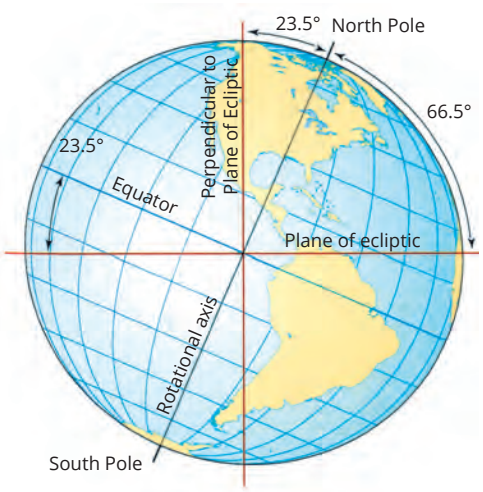
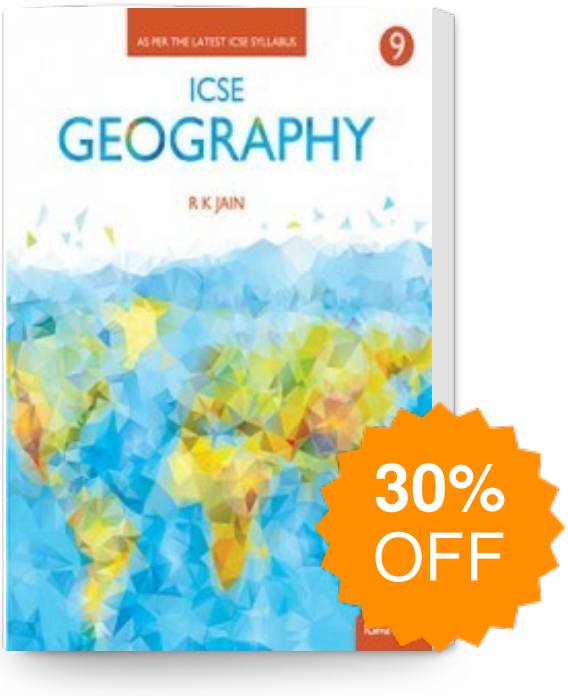


Fig. 2.1 Axis and equator of the Earth

Fig. 2.2 The grid system

ICSE Geography Class IX



Publisher : Ratna Sagar ISBN : 9789385976063 Author : Dr R K Jain