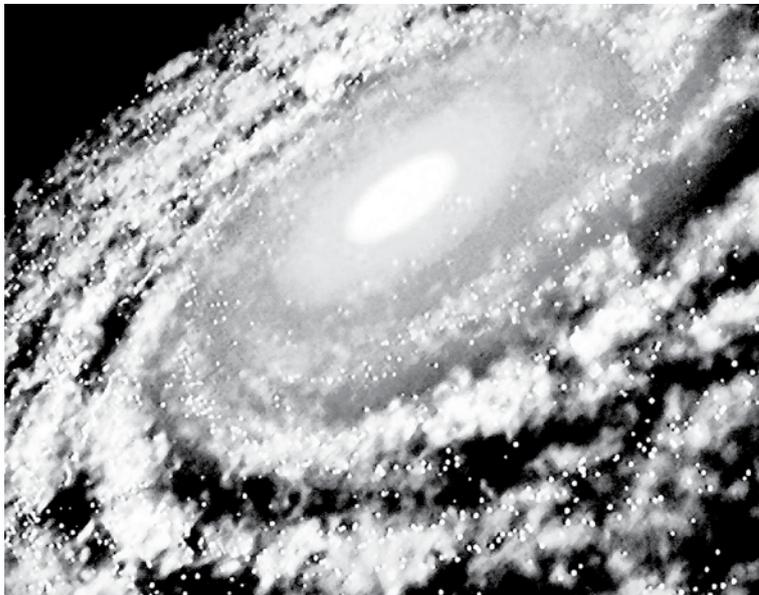


DISCOVERY

Geography for Secondary Classes

Khadija Chagla-Baig



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Introduction

Geography is the study of the Earth, where human beings, animals, and plants live. Geography comes from two Greek words—*geo*, meaning the Earth and *graphein*, meaning to write or to map. Thus it is the study of the Earth, its physical features, its position in space and its movements in relation to the solar system. It is the study of the natural environment—climate, soils, vegetation, land, and water—and of human life and activity and their effect on the Earth. It is also the study of the Earth's physical features and its climate. We need to answer three questions about the Earth and its places: why, where, and how.

The study of geography teaches us why some locations are better for settlements, agriculture, and industries, and where and how changes have taken place in the Earth's landscapes and resources. As the world's population has grown by leaps and bounds, the Earth's natural resources have been exploited, causing environmental problems like pollution and climate change. We study the relationship between man and the natural environment, and the effects of natural hazards like cyclones, volcanic eruptions, earthquakes, and tsunamis.

The *Discovery* series for Classes 6 to 8 has been written with the aim of developing understanding and providing basic knowledge of geography. All topics have been covered in simple language and the content is supported by relevant maps, illustrations, diagrams, and tables. Additional and interesting information, related to the topics under study, is given in the margins. The chapters are divided into sections, each of which concludes with questions and activities to reinforce learning.

The *Discovery* series is designed to be supplemented with an atlas, as this reinforces the concepts taught and clearly illustrates the subject matter at hand. We recommend the *Oxford School Atlas for Pakistan*, which is a comprehensive atlas with an emphasis on the weather, relief and population data for Pakistan.

This Teaching Guide to the *Discovery* Series is an ideal accompaniment to the Pupil's Books. It contains detailed lesson plans, additional background information for the teachers, answers to the questions asked in the textbook, and supplemental worksheets which may be photocopied. It is a valuable resource which will enable the teacher to bring the subject matter to life and hopefully inculcate a lifelong understanding and appreciation of geography within the pupils.

Chapter 1

The Earth as a planet

SECTION 1

THE UNIVERSE

Teacher's focus:

The mysterious expanse of darkness that we see at night is beyond the scope and understanding of a layperson, and totally unreachable. We can only marvel at it, and think about the unknown life that may be out there, making us wonder about its boundaries and what exists beyond. Geographers and scientists are coming up with some plausible answers for those people who want to know more about the cosmic world.

It is widely believed that somewhere between 13–15 billion years ago, there was a collision between matter and energy. This collision is known as the Big Bang. The Big Bang Theory states that when all the particles from this great collision settled down, it formed the universe. The universe was hot when it was created but it started to cool down with the passage of time. The universe contains living matter and non-living matter including stars, galaxies, planets, dust clouds and light. The universe is infinite and it is forever expanding.

The universe contains billions of galaxies made up of millions and billions of stars. Each galaxy has its own solar system. The name of our galaxy is the Milky Way. The Milky Way consists of the Sun and its eight planets. All planets revolve around the Sun on a fixed path called the orbit. We live on planet Earth, the planet third furthest from the Sun. So far, it is the only known planet that supports life and life forms.

Answer key

Questions and Activities

1. The universe is a vast expanse of space that contains galaxies. A galaxy is a collection of stars, gases, and dust that exists in the universe.
2. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune
Sun, satellites (moons), asteroids, comets, meteoroids, dust, and gases
3. Most moons: Jupiter; no moons: Mercury and Venus
4. anticlockwise
5. i. Mercury ii. Neptune iii. Jupiter iv. Mercury
6. i. whole ii. 500 iii. rays iv. galakt v. satellite vi. asteroids

Lesson plan

Resources: Textbook pages 3–5

Teaching objectives:

- to teach students about the Solar System—the Sun, planets, and their satellites, planetary movements
- to inform students about the Earth as part of the Solar System with relation to other planets

Learning outcome:

Students should know all components of the Solar System, and be able to understand its workings key data, and the significance of the Earth.

Lesson 1

Introduction (10 minutes):

Begin the lesson by asking the class if they have ever sat under the sky at night and wondered what the blackness is all about. Ask them if they know anything about the Solar System and what they think it is. Discuss their answers. See how many of them are able to understand the idea. Draw the Solar System on the board (or use a picture/poster if available) to give an idea of what the Universe, galaxy, and Solar System are.

Explanation (25 minutes):

Use the text pages 3–5 as support material. Explain the connections clearly: the Universe, galaxies as part of the universe, the Milky Way as our galaxy, the Solar System as part of the Milky Way and the planets and their satellites as part of the Solar System and the Earth as our home and a life sustaining planet. Read and discuss the main ideas in the textbook. Focus on the estimated age of the universe. Explain the Big Bang Theory and ask students what they think could have happened.

Conclusion (5 minutes):

Recap the lesson by summing up the key points of the lesson. Ask short questions to check their understanding.

Classwork: None

Homework: Read pages 3–5. Mark difficulties, if any.

Worksheet: None

Lesson 2

Introduction (5–10 minutes):

Begin the lesson by asking short questions from the text to reinforce reading homework. Give instructions for classwork.

Written work (30–35 minutes):

Questions 1–6 on page 6

SECTION 2

THE EARTH

The Earth's shape has always been an interesting topic not only for geographers but also for students, teachers, and people from other academic disciplines. Though it is not physically possible to see the Earth using the naked eye, we are able to rely on satellite images taken from space and inferences based on common sense and observation.

In early days, people believed the Earth to be flat. Then it was proved that the Earth was not flat but spherical. Most geographers suggest that it resembles an orange—bulging at the centre and slightly flattened at the top and bottom.

Observations and common sense prove that the Earth is indeed spherical, because travellers who begin their journey from one point always come back to the same point. Second, if one looks at the sky and horizon, one sees the two meet, forming an arc. A ship sailing far towards the horizon appears to be falling over on the other side. The shadow cast in a solar eclipse is also arc-like which shows the circular edge of the Earth.

The shape of the Earth is important because many studies are based on it.

Answer key

Questions and Activities

1. 149,503,000 km or 92,897,000 miles
2. Spherical. A ship moving away from the harbour appears to be sinking; upon entering the harbour, a ship's funnel appears first; during an eclipse, the edge of the shadow appears as an arc; sailors who go around the world come back to the place from where they began their voyage.
3. Equatorial diameter=12,756 km, polar diameter=12,715 km
4. 40,075 km

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 7–8

Teaching objective:

- to explain the implications of Earth's shape

DISCOVERY 1

Teaching Guide

Learning outcome:

Students should be able to explain how the shape of the Earth was ascertained and how it lays the foundation for basic geography.

Introduction (5–10 minutes):

- If possible, show the following video clip to students to form the basis for discussion.
<http://www.bbc.co.uk/learningzone/clips/how-do-we-know-the-earth-is-spherical/2457.html>
- Take a football or a basketball to the classroom. Put it on the table. Make a paper boat with a hull and move it over the top of the ball in such a way that it appears to fall off to the other side. Explain that this is exactly what one sees when a ship disappears over the horizon. If the Earth was flat, the ship would be observed for miles and miles. With the use of binoculars it would never go out of sight. But since the Earth is round and not flat, it disappears from sight, with the hull disappearing first, giving the impression that it's gone over a spherical surface, just as they observed with the ball.
- Next give the students the example of a person climbing stairs. When he does so, his head appears first and then the rest of his body. Remind them about what they observed with the ball. Since the ball is circular, if a tiny figure was to climb up from behind, the head will appear before the rest of the body. This is exactly what is observed about the Earth because of its circular shape. Discuss many such observations were made by people, which proved beyond doubt that the Earth was round.

Explanation (25–30 minutes):

Read and discuss the text, breaking it down into simpler information as it contains a lot of numerical and conceptual data, which is important for the students to retain. Talk further about the observations and proofs regarding the Earth's shape. Explain the difference between polar and equatorial circumference and diameter with the help of the diagram on page 8.

Conclusion (5–10 minutes):

Review the key points of the topic. Ask students short questions to check how much they have retained. Remove any confusions.

Homework: Questions 1–4 on page 8

SECTION 3

THE EARTH'S MOVEMENTS

Teacher's focus:

The shape of the Earth—its bulge, tilt, and movements, cause many phenomena, such as that of day and night and seasons. The Earth spins or rotates on its axis, with the result that when one side is facing the Sun, the other side faces away from it. The part that faces the Sun has day and the one away from it has night. It rotates in an anti-clockwise direction.

The Earth is divided into two imaginary halves called the northern hemisphere and the southern hemisphere (*hemi* meaning half, *sphere* meaning circle). In addition to rotating on its axis, the Earth also revolves around

the Sun. Each revolution takes approximately 365 days to complete. Because of the Earth's tilt at 23.5 degrees, when one hemisphere of the Earth is tilted towards the Sun, the other hemisphere is tilted away from it. There is summer in the hemisphere tilted towards the Sun and winter in the hemisphere tilted away from it. The seasons in both the hemispheres are always the opposite. When it is winter in the northern hemisphere, the southern hemisphere will experience summer and vice versa. Areas around the Equator experience hot weather throughout the year because it faces the Sun directly. The poles are the furthest from the Sun and receive the least amount of sunlight for the least amount of time and have a freezing climate.

Answer key

Questions and Activities

1. Rotation: spinning of the Earth on its axis; revolution: circling of the Earth around the Sun on its orbit
2. The Earth spins or rotates on an imaginary line called the axis. It completes one rotation in 24 hours. The part that faces the Sun has day and the one away from it has night.
3. At the Equator because of the direct Sun throughout the year
4. Midnight sun refers to 24 hours of daylight and polar night refers to 24 hours night in the Arctic and Antarctic regions.
5. i. 22 June, 22 Dec ii. 22 Dec, 22 June
6. spring, summer, autumn, winter
7. The Earth revolves around the Sun in a fixed orbit. This revolution causes varying amounts of sunlight to reach different parts of the Earth. As some parts of Earth face the Sun for longer periods of time, they experience hotter temperatures, whereas those parts of the Earth facing away from the Sun experience relatively cooler temperatures. This is why we have different seasons and climates in different countries. (Tally the diagram with the one on page 13.)
8. The polar regions, or the Arctic and Antarctic circles, because they are furthest from the Sun and so receive the least amount of sunlight for the least amount of time.
9. The Equator receives direct sunlight from the overhead Sun throughout the year.
10. A year with 366 days because February has 29 days. 2008, 2012.
11. 21 March, 23 September. Equinox. An equinox occurs when the Sun's rays are overhead on either of the two tropics.
12. i. rotation ii. revolution iii. axis iv. the Equator v. opposite
13. i. Because the sun rises in the east and sets in the west due to its rotation from west to east.
ii. The Equator is the centre of the Earth and the Sun is overhead.
14. i. astronomy ii. elliptical iii. axis iv. summers v. summer
vi. astronomer vii. telescope, Kepler viii. dark night ix. above v. autumnal

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 9–13

Teaching objective:

- to familiarize students with the concept of rotation and its effects

Learning outcome:

Students must be able to understand the effects of rotation.

Introduction (5 minutes):

Using the drawing on page 9, introduce the topic. Point out the different divisions on the Earth in that drawing. Prepare students for the activity.

Explanation (30 minutes):

Use activity on page 14 to explain the key concepts on pages 9–12. Point out the hemispheres, asking the students to mark them on the models. As the students make the models, demonstrate rotation and revolution turn by turn. Discuss how different areas of the Earth get different amounts of sunlight. Explain the text as a parallel process.

Conclusion (5 minutes):

Recap the lesson. Focus on the imaginary lines and how they determine the amount of sunlight. Reinforce the concept of opposite seasons in the two hemispheres.

Homework: Questions 1–5 on page 13

REVOLUTION AND SEASONS

Teacher's focus:

The Earth's second movement is called revolution. This is when the Earth revolves around the Sun in a fixed orbit. Proximity to the Sun, as a result of revolution, causes varying amounts of sunlight to reach different parts of the Earth, at different times, and causes the seasons. As some parts of Earth face the Sun for longer periods of time, they experience hotter climates, whereas those parts of the Earth facing away from the Sun experience relatively cooler climates. This explains why we have different seasons and climates in different countries. Based on general climatic conditions, the Earth has been divided into the polar, equatorial, and tropical (cold, moderate, and hot) zones.

The Earth takes 365 and $\frac{1}{4}$ days to complete one revolution. Because we cannot have $\frac{1}{4}$ of a day, we add it up to have one full day after every four years. This extra day is added to February giving it 29 days. Such a year is called a leap year.

An equinox is a period of equal day and night. It occurs twice a year—on March 21 and September 23,

because the overhead Sun is directly at the Equator, the centre of the Earth. The equinox in March is called the spring or vernal equinox and the September equinox is called the autumnal equinox. The names of the equinoxes announce the beginning of the season they bring.

A solstice is a period of unequal day and night. During a solstice, the night is much longer than the day or vice versa. On June 21 the northern hemisphere experiences a summer solstice, i.e. longest day and shortest night. On the same day, the southern hemisphere experiences the winter equinox, i.e. the longest night and shortest day of the year. The reverse happens on December 23. A solstice occurs when the Sun's rays are overhead on either of the two tropics.

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 11–13

Teaching objectives:

- to explain the effects of revolution
- to explain what solstices and equinoxes are—and why they occur

Learning outcome:

Students should be able to understand the process of revolution and how it causes the seasons. They should be able to explain what solstices and equinoxes are and what the difference between the two is..

Introduction (5 minutes):

Ask students if they have observed the changing lengths of day and night. Discuss their responses. Introduce the words equinox and solstice and their root words.

Explanation (30 minutes):

Using the diagrams on page 12 point out the position of the Earth and where the Sun's rays fall. Explain the text, focusing on the dates and position of the Sun's rays.

Conclusion (5 minutes):

Revise and reinforce the lesson by summarizing the key concepts and asking questions.

Homework: Questions 6–14 on page 13

WORKSHEET 1

Date: _____

Name: _____

1. Choose the correct word to complete each of the sentences below.

- i. The Earth is not a _____ body (static, aquatic, moving).
- ii. The Earth spins or _____ (revolves, rotates, circles) from west to east on its axis.
- iii. The length of days and nights are not _____ everywhere on the Earth (equal, unequal, parallel).
- iv. The polar region in the northern hemisphere is called the _____ Circle and the polar region in the southern hemisphere is called the _____ Circle (Arctic Circle, Antarctic Circle).

2. How many hours does the Earth take to complete one rotation?

3. Draw a diagram to show day and night. Also show the following imaginary lines with their angular position.

Tropic of Cancer, Tropic of Capricorn, Equator, North Pole, South Pole, Arctic Circle, Antarctic Circle, anticlockwise direction

SECTION 4

ECLIPSES

Teacher's focus:

An eclipse is a natural phenomenon, in which sunlight to the Earth or moon is blocked. An eclipse takes place when the Sun, moon, and the Earth are completely aligned. Eclipses happen because the Earth orbits around the Sun and the moon orbits around the Earth. When the moon comes between the Earth and the Sun, a shadow is cast on the Earth, causing a solar eclipse. When the Earth comes between the Sun and the moon, the sunlight reflected to the moon gets blocked, causing a lunar eclipse. Eclipses can be predicted.

Answer key

Questions and Activities

1. An eclipse is the casting of shadows or shadow effects when sunlight to the Earth or moon gets blocked.
2. The moon comes between the Earth and the Sun, casting a shadow on the Earth.
3. November 13, 2012
4. When the Earth comes between the Sun and the moon and all light to the moon gets blocked.
5. Open question
6. The UV radiation from the Sun is strong enough to permanently damage the retina.

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 15–17

Teaching objectives:

- to introduce the concept of an eclipse
- to explain how and why this phenomenon takes place
- to differentiate between the two kinds of eclipses

Learning outcome:

Students must be able to understand why an eclipse takes place.

DISCOVERY 1

Teaching Guide

Introduction (5 minutes):

Ask students if they have noticed what happens when someone stands in front of a door or window with light in the background. Get a student to stand in front of a window and show how and why the light was blocked and a shadow was cast. Use differently sized objects to show the effects on the size of the shadows

Explanation (25 minutes):

Using the activity on page 17, explain how eclipses take place. Ask different students to align the Earth and moon alternately with the Sun. Keep demonstrating to the students where the shadows fall and how much light gets blocked and why. Read and explain pages 15 and 16 from the text along with the activity.

Conclusion/Classwork (10 minutes):

Wind up the lesson, recapping the main points and clearing up any confusion. Give questions 1, 2, and 4 for classwork.

Homework: Questions 3, 5, and 6

SECTION 5

CONTINENTS AND OCEANS

Teacher's focus:

Continents are large landmasses on which people live. They cover roughly 29 per cent of the Earth's surface. Oceans are large bodies of salt water that cover nearly 71 per cent of the Earth's surface. Both are very important for life.

Answer key

Questions and Activities

- Oceania is in the Pacific Ocean and represents Australia, New Zealand and smaller islands of the Pacific Ocean.
- Antarctica is the only continent which is uninhabited by humans. It has a unique animal population which includes seals, whales, squids, penguins and a variety of fish. It is completely covered by ice and is the largest reservoir of fresh water on the Earth.
- In the northern hemisphere, 61% of the surface is water and 39% is land. In the southern hemisphere, 81% is water and 19% is land.
- | | | |
|------------------------|--------------------|---|
| i. 510 million sq km | ii. land and water | iii. land/continents, water/oceans and seas |
| iv. continents, oceans | v. Asia, 29.7 | vi. Mount Everest, Marianas Trench |

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 18–20

Teaching objective:

- to familiarize students with the names, locations, and statistics of the continents and oceans

Learning outcome:

Students must know the names and locations of all the continents and oceans and retain basic information about them.

Introduction (5 minutes):

Begin by asking the names of the oceans and continents and locating them on a globe or map.

Explanation (25 minutes):

Read the text pages 18 and 19 and discuss the statistics and data given for oceans and continents.

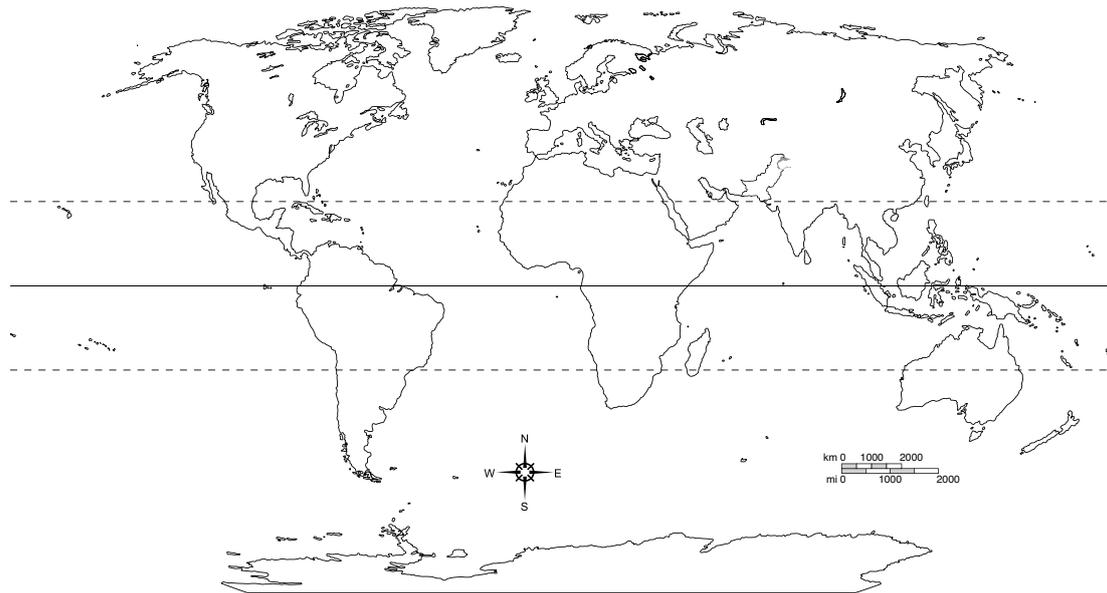
Conclusion/Written work (10 minutes):

Revise all content. Give reinforcement worksheet.

WORKSHEET 2

Date: _____

Name: _____



1. Label and colour oceans and continents of the world. Oceans should be shades of blue, continents should be shades of green or brown.

2. Choose the correct word to complete each of the sentences below.

- i. Land masses on the Earth are called _____ (plains, landforms, continents).
- ii. Out of the total area of 510 million sq km, approximately 360 million or ____ percent of the Earth's surface is covered by oceans and seas (71, 73, 78).
- iii. The word _____ represents Australia, New Zealand, and smaller islands of the Pacific Ocean (Pangea, Oceania, Fiji Islands).
- iv. The largest continent is _____ and it covers 30 per cent of the total land mass (Europe, North America, Asia).
- v. The highest point on Earth is _____ at 8848 metres above sea level (K2, Himalayas, Mount Everest).

- vi. The deepest point in the ocean is the _____ at 11,022 meters below the surface of the sea (Coral Reef, Mariana Trench, Himalayas).
- vii. The only continent that does not have human habitation is _____ (Oceania, Antarctica, Africa).
- viii. The largest ocean is the _____ Ocean (Indian, Atlantic, Pacific).
- ix. The Caribbean Sea and the Mediterranean Sea are located along the margins of the _____ Ocean (Atlantic, Southern, Arctic).
- x. Continents are _____ while oceans are deep (flat, elevated, broken).

3. What is the ocean and continent distribution in the northern and southern hemispheres?

Chapter 2

Globes, maps, and their uses

SECTION 1

GLOBES

Teacher's focus:

Globes and maps help us to locate places on Earth and they also provide information that can be easily accessed, at a single glance. Globes are spherical representations of the Earth; therefore the eye can only see certain parts at one time. Maps are flat drawings of the Earth, in which the entire world can be seen at a single glance. A book of maps is called an atlas.

Maps are useful because not only do they help us locate places but they also provide quick information about different places at a single glance. Maps are divided into different kinds, based on their function and purpose. Relief maps illustrate how high or how low a place is, with reference to the sea level. Political maps show us countries and their capitals. Vegetation maps show us the natural vegetation of a place. Weather maps provide information about different weather conditions; sometimes different weather conditions can have separate maps, for example annual rainfall and precipitation, humidity, cloud cover, etc. A city guide map can show different parts of a city including natural and manmade features such as roads, railway tracks, parks, important buildings, and landmarks.

Answer key

Questions and Activities

1. A globe represents the spherical shape of the Earth.
2. A globe is a spherical model of the Earth; all places cannot be seen at the same time. A map is a flat drawing of the Earth in which all details can be seen at a single glance.
3. Large scale maps show smaller areas in more detail, small scale maps show larger areas in less detail.
4. Maps convey more information at a single glance and to show the entire world at one go
5. A map helps to locate places, get directions and convey information about places at a single glance. Maps are more portable.
6. Ptolemy 150 CE
7. i. True ii. False iii. True iv. False v. True

8. Martin Behaim made the oldest existing globe. Ptolemy compiled an encyclopedia about the ancient world which included maps and geography.
9. An atlas

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 22–26, *Oxford School Atlas for Pakistan*

Teaching objectives:

- to familiarize students with the idea and purpose of a map and globe and to illustrate the difference between the two
- to introduce different kinds of maps

Learning outcome:

Students should be able to understand the purpose of different kinds of maps and globes.

Introduction (5 minutes):

Bring a globe to the classroom and ask students to open up the world map in the *Oxford School Atlas for Pakistan*. Ask students to compare what they can see on both and what are the basic differences.

Explanation (20 minutes):

Using the *Oxford School Atlas for Pakistan*, globe, and textbook, explain the key concepts of the lesson. Discuss the uses and purposes of maps. Students should understand that the different types of maps are categorized on the basis of the information they show.

Conclusion (10 minutes):

Revise the lesson. Give written work as classwork.

Classwork: Questions 1–5 page 26

Homework: Questions 4–9 page 26

WORKSHEET 3

Date: _____

Name: _____

1. What is cartography?

2. Explain how a map would be helpful to:

a pilot

a tourist

a student

SECTION 2

COMPONENTS OF A MAP

Teacher's focus:

Map reading is a skill that requires thorough understanding of the components of a map. All maps must have (a) map projection, (b) scale, (c) key or legend, and (d) compass.

The map projection illustrates how latitudes and longitudes have been projected or transferred from a spherical measurement, such as a globe to a flat surface, such as a sheet of paper.

The entire world cannot be mapped. So cartographers reduce the actual area of the Earth to smaller units that can be measured with a scale. It basically gives us the ratio of the area drawn on a map to the actual area of the Earth in miles or kilometres. The scale tells us by how much the area in the map has been reduced. The scale is present on the map as a linear scale (a straight line divided into bars), statement scale (1 cm=100,000 km) or representative fraction (1:100,000 or 1/100,000).

Key, legend, and symbol are different names for the same thing. As it is not possible to write full forms of names and landforms, due to limited space, cartographers use different symbols or codes to represent different features on a map. For example, a thin blue line can be used to show a river, brown triangles to show mountains, and so on.

A compass shows the four directions and their sub-directions. The arrow on the map will always point to the north.

Answer key

Questions and Activities

1. Map projection, scale, symbols, and compass.
2. The scale is present on the map as either a linear scale (a straight line divided into bars), a statement scale (1 cm=100,000 km) or representative fraction (1:100,000 or 1/100,000).
3. They are clues or codes in short form to help understand different features on a map.
4. The four directions: north, south, east, west.
5. By selecting two points on a map and measuring the distance between them and converting it according to the given scale.

Lesson plan

No of lessons: 1

Duration: 40 minutes

DISCOVERY 1

Teaching Guide

Resources: Textbook pages 27–30, *Oxford School Atlas for Pakistan*

Teaching objectives:

- to describe to students the components of a map and to emphasize their purpose and significance
- to teach students how to read maps using these components

Learning outcome:

Students should be able to explain how the components of a map are used to read a map and understand the information given.

Introduction (5 minutes):

Show students the components on their atlas and ask them if they know what they are and what they represent.

Explanation (30 minutes):

Using the atlas and textbook, read about the components and discuss. Find them on a pre-selected page in the *Oxford School Atlas for Pakistan*. Read the map, using each component to understand the given information.

Conclusion (5 minutes):

Ask students to do the research task on page 30.

Homework: Questions 1–5 on page 30

SECTION 3

FINDING LOCATIONS

Teacher's focus:

Latitudes and longitudes are imaginary lines on the globe, which are used to help locate places. They also determine global climatic zones and time zones.

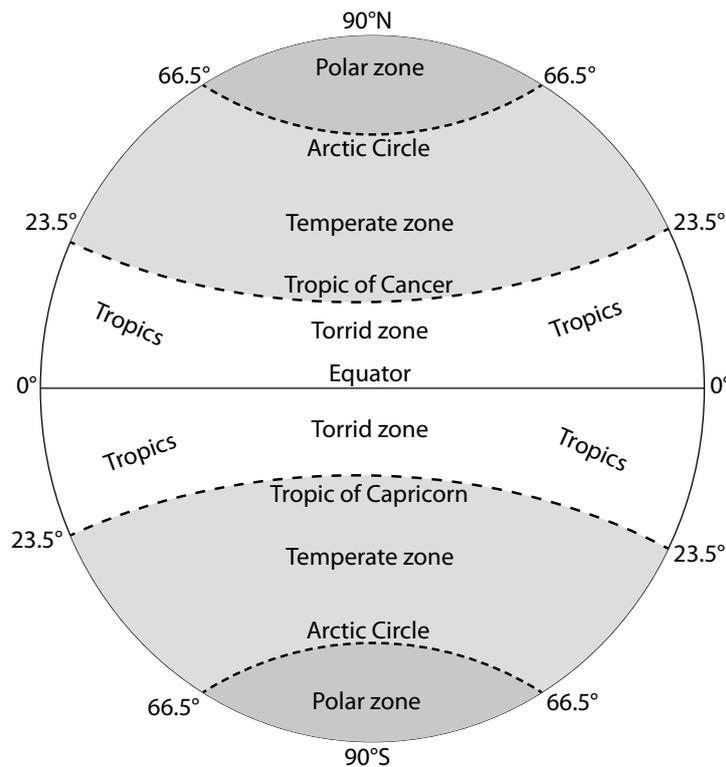
Latitudes are parallel, horizontal lines that run in an east-west direction. The Equator is the central latitude at 0 degrees and all other latitudes are measured north or south of the Equator. Latitudes are also known as parallels because they are parallel lines, i.e. they never converge or meet at any point. There are 180 degrees of latitude; 90 degrees each in both the hemispheres. Lines of latitude get shorter as they move away from the Equator towards the poles. The Arctic and Antarctic Circles and the Tropics of Cancer and Capricorn are latitudes. Latitudes show us different climatic and temperature belts of the world.

Longitudes are vertical lines that run from north to south, converging or meeting at both the poles. There are 360 lines of longitude; 180 each in the eastern and western hemispheres. Longitudes are also known as meridians. The Prime Meridian is the central longitude at 180 degrees and all other longitudes are measured east or west of the Prime Meridian. The International Date Line is another important longitude. Longitudes

help us calculate time and time differences all over the world.

When latitudes and longitudes intersect, they form grids which have coordinates that help to locate places. The grids are labelled with an alphabet and a number for example A2, B6.

Latitudes determine climatic zones. The illustration below shows the broad classification.



Answer key

Questions and Activities

1. When latitudes and longitudes cross, they form rectangular boxes called grids, which are used to find the location of any place on the globe.
2. Latitudes are parallels, they are used to determine climatic zones; longitudes are meridians, they are used to determine time zones.
3. Equator 0° , Tropic of Cancer $23\frac{1}{2}^\circ\text{N}$, Tropic of Capricorn $23\frac{1}{2}^\circ\text{S}$, Arctic Circle $66\frac{1}{2}^\circ\text{N}$ and Antarctic Circle $66\frac{1}{2}^\circ\text{S}$
4. The central longitude at 0° ; in Greenwich near London, UK
5. GPS provides exact coordinates which helps to find exact locations on the ground, and it can help in security systems to track down cars.

Lesson plan

No of lessons: 2

Duration: 40 minutes

Resources: Textbook pages 31–34, *Oxford School Atlas for Pakistan*

Teaching objective:

- to explain the significance of latitudes and longitudes and their applications, including their relevance to our daily lives

Learning outcome:

Students should be able to explain the significance of latitudes, longitudes, and grids and read maps using these tools.

Lesson 1

Introduction (5 minutes):

Introduce the lesson by asking students what they know about latitudes and longitudes. Use the atlas to illustrate what latitudes and longitudes are, how they cross to form grids, and how those grids are used to locate places on the map.

Explanation (25–30 minutes):

Use the text (pages 32–33) to explain latitudes, longitudes and grids. Support the explanation, using the atlas as a guide, to illustrate the characteristics of latitudes and longitudes, including the number of degrees. Mention the northern and southern hemispheres and other imaginary lines with their angular measurements. The index given in the *Oxford School Atlas for Pakistan* should be discussed to show the standard way for writing coordinates.

Conclusion (5–10 minutes):

Use question 5 on page 30 as an activity to reinforce the application of lines of latitude and longitude for finding locations. Train students to use a pencil and ruler to move along lines of latitude and longitude to familiarize them with the idea of locating places. The index at the back of the *Oxford School Atlas for Pakistan* can also be used to cross check. Give a similar activity for homework.

Lesson 2

Introduction (5 minutes):

Explain worksheet 4

Written work (30–35 minutes):

Questions 1–6 on page 6

WORKSHEET 4

Date: _____

Name: _____

1. Using the index in your *Oxford School Atlas for Pakistan*, write the latitudes, longitudes, and grids for:

Karachi: _____

Melbourne: _____

New Delhi: _____

Beijing: _____

Los Angeles: _____

2. Explain how the study of latitudes and longitudes is important to:

a student

a teacher

a pilot

a travel agency

SECTION 4

GLOBAL TIME SYSTEM

Teacher's focus:

As discussed in Chapter 1, the rotation of the Earth causes day and night to occur at different times all over the world. In order to harmonize world time, geographers have divided the Earth into 24 time zones, because there are 24 hours in a day. This means that each time zone is made of 60 minutes or one hour. There are 360 degrees of longitudes and the Earth takes 24 hours to complete one rotation. Therefore each time zone comprises of 15 degrees ($360/24=15$). This means that the Earth rotates 15 degrees in 60 minutes.

The Prime Meridian is the central longitude at 180 degrees, which means it is the vertical centre of the Earth. It divides the Earth into the eastern and western hemispheres. The Prime Meridian passes through Greenwich, near London, UK. All time zones are measured east or west of the Prime Meridian. Global time is set according to the time at Greenwich which is written as GMT (+) or (–) because of its being the vertical centre. GMT stands for Greenwich Mean Time. Pakistan is in the 5th time zone east of Greenwich. When we calculate time, we say PST (Pakistan Standard Time) is GMT+5. So if it is 12.00 pm in Greenwich, it will be 5.00 pm in Pakistan.

As we move east of Greenwich we lose time but we add the number of hours. As we move west of Greenwich, we gain time but we subtract the number of hours. For example when it is 12.00 pm or noon in Greenwich, it is 5.00 pm (GMT+5) in Pakistan, which means that Pakistan is ahead of Greenwich because it is in the east. When it is 12.00 pm in Greenwich, it will be 7.00 am (GMT–5) in the countries that are in the 5th time zone east of Greenwich.

Another important longitude for calculating and standardizing time is the International Date Line which is the semicircle opposite the Prime Meridian. As you cross the International Date Line, the day and date change.

These time calculations are very important for everyone, especially the aviation industry including airports, hotels and travelers.

Answer key

Questions and Activities

1. It is the time system linked to the Sun.
2. Geographers have divided the Earth into 24 time zones because there are 24 hours in a day. This means that each time zone is made of 60 minutes or one hour. There are 360 degrees of longitudes and the Earth takes 24 hours to complete one rotation. Therefore each time zone comprises of 15 degrees ($360/24=15$). This means that the Earth rotates 15 degrees in 60 minutes.
3. The Prime Meridian is the central longitude at 180 degrees, which means it is the vertical center of the Earth. It divides the Earth into the eastern and western hemispheres. It is located near Greenwich, a city near London. All time zones are measured east or west of the Prime Meridian. Global time is set according the time at Greenwich which is written as GMT (+) or (–) because of its being the vertical center.

4. 8 pm.
5. Another important longitude for calculating and standardizing time is the International Date Line which is the semi-circle opposite the Prime Meridian at 0 degrees. As you cross the International Date Line, the day and date change.
6. Because the time is 12 hours less than Greenwich
7. To keep different countries within the same time zone
8. i. 24 hours ii. longitude iii. 24
iv. 15 degrees v. added, Prime Meridian vi. International Date Line

Activity:

New York GMT-5 hours=7.00 pm

Mexico City GMT-6 hours=6.00 pm

Los Angeles GMT-8 hours=4.00 pm

Cairo GMT+2 hours=2.00 am

Jeddah GMT+3 hours=3.00 am

Karachi GMT+5 hours=5.00 am

Thailand (Bangkok) GMT+7 hours=7.00 am

Japan (Tokyo) GMT+9 hours=9.00 am

Lesson plan

No of lessons: 2

Duration: 40 minutes

Resources: Textbook pages 35–36, *Oxford School Atlas for Pakistan*, website <http://www.timeanddate.com/worldclock/city.html?n=757>

Teaching objectives:

- to explain the importance of time zones and the basis of determining standard times
- to show students how to calculate time in different parts of the world using GMT

Learning outcome:

Students should know why global standard time is important and how it is calculated.

Lesson 1

Introduction (5 minutes):

Begin the discussion by asking students about relatives and friends in other parts of the world. Talk about how we have to consider time differences before calling or messaging them. Introduce time zones as a system linked to the Sun and rotation, as covered in Chapter 1.

Explanation (30 minutes):

Explain the text pages 35–36. Use the time zone map to further clarify the divisions and all related concepts.

DISCOVERY 1

Teaching Guide

Conclusion (5 minutes):

Conclude the lesson by asking students questions related to the topic to gauge their understanding.

Homework: Read pages 35–36 thoroughly. Mark difficulties, if any.

Lesson 2

Duration: 40 minutes

Resources: Textbook pages 36–37

Introduction (5–7 minutes):

Ask short questions to reinforce all concepts. Give instructions for written work.

Written work: (35 minutes)

Activity on page 37, Questions 1–3 on page 37

Homework: Questions 4–7 on page 37

SECTION 5

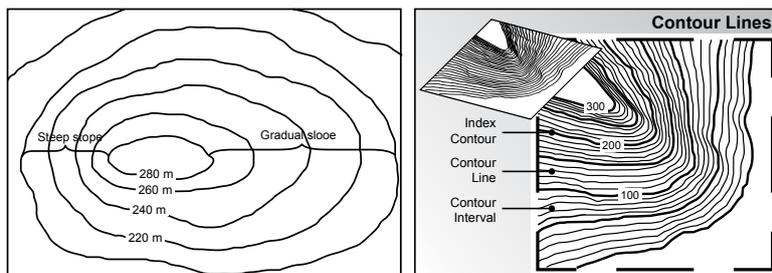
METHODS OF SHOWING RELIEF

Teacher's focus:

The Earth's surface is not flat. It rises and falls to various heights and depths. Continents have different heights and oceans have varying depths. Land height is known as relief. Relief maps show different land heights above the sea level in metres or feet.

There are different ways of illustrating land heights on a map, such as by shading or colouring. Different land heights are first grouped and each group is allotted a colour, which means all places on the Earth with the same height are shaded with the same colour. Shades of green and brown are usually used for land height. The depths of oceans are similarly done, usually with shades of blue.

Contours are lines that connect different land heights at a given place. The result is uneven circular patterns which illustrate the steepness/incline and the shape of land. The closer the lines, the steeper the landform. A square-topped mountain will have a square centre. A steep mountain with a pointed peak will have contour lines very close and the centre will be very small.



Spot heights provide the specific height of a particular landform with the help of a spot or symbol.

Answer key

Questions and Activities

1. Land surface and its various formations
2. It is important for pilots, travelers, geographers to know the heights of various places on the map
3. Colour shading, contour lines and spot heights
4. i. False ii. True iii. False iv. True
5. i. relief ii. contour

Lesson plan

No of lessons: 1–2

Duration: 40 minutes

Resources: Textbook page 38, *Oxford School Atlas for Pakistan*

Teaching objectives:

- to explain the significance of land heights
- to illustrate how they are shown on maps

Learning outcome:

Students should be able to interpret relief maps.

Introduction (5 minutes):

Open the *Oxford School Atlas for Pakistan* to Relief Maps and ask students to observe it closely. Ask questions which prompt discussion, such as, why are there so many colours, what could the key mean, etc. Introduce the concept of land height.

Explanation (15 minutes):

Read and explain the text on page 38.

Conclusion (20 minutes):

Reinforce concepts with the help of activity on page 38. This activity can also be used as an introduction to the lesson.

Homework: Questions 1–4 on page 39

Chapter 3

The natural spheres of the Earth

SECTION 1

THE ATMOSPHERE

Teacher's focus:

Our Earth is shaped like a sphere. It consists of different layers that have taken on a spherical shape, like wrapping paper is covering a ball and this is why the Earth's layers are known as its different spheres. The atmosphere is an invisible layer of gases that envelops the interior and exterior of the Earth. The lithosphere is the layer of rocks that make up the Earth. The hydrosphere is the layer of water that is present on the Earth's surface. Lastly, the biosphere comprises of all life forms found along the Earth. All the spheres are unique, have their own purpose and are dependent on each other for a sustainable Earth.

Answer key

Questions and Activities

1. The atmosphere is an invisible layer of gases that envelops the interior and exterior of the Earth. The lithosphere is the layer of rocks that make up the Earth. The hydrosphere is the layer of water that is present on the Earth's surface. Lastly, the biosphere comprises of all life forms found along the Earth.
2. The atmosphere is made up of gases like nitrogen, oxygen, carbon dioxide, argon, helium and other gases, water vapour and dust particles. It provides the air we breathe.
3. i. evaporation ii. atmosphere iii. 78.09 iv. 29 v. lithosphere
4. Atmosphere: clouds, rainbow
Biosphere: zebras, flowers
Hydrosphere: lakes, oceans
Lithosphere: mountains, deserts

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 41–43

Teaching objective:

- to familiarize students with the natural spheres and their structure

Learning outcome:

Students should understand the structure and components of the four spheres and their significance.

Introduction (5 minutes):

Begin with a brief explanation of the different layers of the Earth and name the four spheres.

Explanation (30 minutes):

Read and explain text pages 41–43. Stress on the importance of the spheres as natural resources.

Conclusion (5 minutes):

Recap lesson by asking questions to check level of understanding.

WORKSHEET 5

Date: _____

Name: _____

1. Choose the correct word to complete each of the sentences below.

- i. Oceans are the main source of _____ (evaporation, biosphere, rainfall).
- ii. The atmosphere provides the air we breathe and protects us from harmful _____ (plants, radiation, water).
- iii. The word _____ means rock (bio, litho, sedi).
- iv. Geologists use the word _____ for the Earth's uppermost solid part of the Earth (crust, mantle, core).
- v. The word '*hydro*' is a Greek word which means _____ (land, life, water).

2. Answer the questions.

- i. Why are there so many Greek words in geography?

- ii. What is the hydrosphere made of?

- iii. What is the main product of a forest and what is it used for?

SECTION 2

HUMANS AND THE ENVIRONMENT

Teacher's focus:

Humans and the environment are interdependent and each affects the other. For instance, humans depend on rivers for fresh water and the supply of water in rivers depends on natural factors like rainfall and snow. The quality of water depends on humans—how clean they keep rivers and how much pollution they cause.

On the other hand, human life can get affected by natural disasters like floods, earthquakes, floods, and droughts. Sindh has witnessed floods, drought, and famine in the last few years. The Tharparkar area of Sindh is frequently hit by drought and famine because of decreasing rainfall in the desert area. The plains of Sindh and Punjab have suffered due to heavy monsoon rains and lack of planning.

Most importantly, humans depend on the environment because it sustains natural vegetation and provides habitats for other life forms. Features which make up the environment around us, such as rivers, lakes, seas, mountains, plains, and forests, are all important life-sustaining resources that are vital for human life.

Answer key

Questions and Activities

1. Temperature affects the quality of human life as it controls the kind of vegetation and other life forms present in a certain place. A place must have suitable climate for crops to grow.
2. Deserts have harsh, extreme climates. During the day it becomes unbearably hot; at night deserts can have freezing temperatures.
3. It is essential for all forms of plant, animal and human life.
4. rivers, lakes, oceans and seas, springs, rain water, snow, water vapour
5. drinking, irrigation, washing
6. Lakes and rivers are a source of water, food (fish and other animals), irrigation, transportation and generation of electricity.
7. Forests provide fresh oxygen to the environment, just like lungs supply oxygen to the body.
8. Forests are a source of oxygen, home to a variety of animals, regulator of temperature on earth, source of wood for a number of industries like furniture and paper.
9. The interdependent relationship between physical environment and humans beings
10. Natural resources like trees are being used up, by being cut down at an alarming rate for timber. Wild animals are hunted for their meat, skin, fur and other organs. The natural habitat is being destroyed by too much construction.
11. i. water vapour ii. groundwater iii. deciduous, coniferous, equatorial
iv. ecosystem v. dependant

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 44–49

Teaching objective:

- to make students aware of the interdependent relationship between humans and their environment

Learning outcome:

Students must be able to understand how human activities affect the environment and how nature affects human activities and lifestyle.

Introduction (5 minutes):

Talk about global warming and pollution. Discuss why it is happening and who is to be blamed; linking this with the causes and effects of human actions, for example how some factories use rivers as dumps for their waste.

Explanation (30 minutes):

Read and explain pages 44–49. Connect the key points of the text, such as climate, physical landscape, water, etc, to the natural environment of your city.

Conclusion (5 minutes):

Sum up the lesson by reviewing the key points of the lesson. Ask students to give suggestions for protecting the environment.

Homework: Make a list of steps you can take to protect the natural environment around you.

Chapter 4

Rocks

SECTION 1

IGNEOUS ROCKS

Teacher's focus:

Rocks are an important part of the lithosphere. They form the continent and ocean surfaces and make up the outer layer of the lithosphere, which is called the crust. This crust is to the Earth what the skin is to an apple i.e., a protective layer. The crust is of varying thickness at different points of the Earth. This is because the rocks that make up the crust have different qualities.

Geographers have divided all rocks on Earth into three broad categories on the basis of their nature and formation.

Rocks that are formed by the cooling and hardening of (volcanic) lava are called igneous rocks. Magma is hot molten rock below the Earth's crust. When it gushes out of the surface it is called lava.

When hot molten rock cools below the Earth's crust, it forms hardened rock called intrusive igneous rock which may be found vertically as dikes or horizontally as sills. When lava oozes out of the crust and cools above the surface it is called extrusive igneous rock. Huge chunks of igneous rocks are called batholiths.

Sedimentary rocks are formed when smaller bits of rock, along with coarse and fine pieces of rocks merge into each other, forming layers. Each layer is called strata or bed.

These layers are formed in three ways: mechanically, or by the action of rock fragments of different sizes compressing into each other due to pressure; chemically, or as a reaction of chemicals in rocks reacting with water; organically, or by the accumulation and consolidation of organic material. Organic refers to the remains of dead plant and animals, for example corals and other shelled animals found in the ocean. Their shells are made of calcite, a calcium product. When they die, these hard shells pile up and harden to form rocks.

Metamorphic rocks are rocks that are formed due to pressure (physical metamorphism) or heat (thermal metamorphism) below the Earth's crust.

Answer key

Questions and Activities

1. Rocks formed as a result of cooling and hardening of magma and lava
2. intrusive rocks formed below the surface, e.g. granite; extrusive above the surface, e.g. basalt
3. i. dike ii. sill iii. batholith

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 50–53

Teaching objectives:

- to inform students about the different kinds of rocks that make up the Earth's surface
- to explain the formation process of each kind of rock

Learning outcome:

Students should know the three basic categories of rocks and how they are formed.

Introduction (5 minutes):

Bring a few rocks to class, show them to students and discuss the differences and similarities. Ask students how they think rocks are formed.

Explanation (35 minutes):

Explain what rocks are and why they are significant. Name the three basic kinds. Explain igneous rocks, emphasizing the way they are formed, and the difference between intrusive and extrusive igneous rocks. Make students repeat the names of the igneous rocks shown in the picture.

Conclusion (5 minutes):

Summarize the lesson and highlight the key points.

Homework: Revise pages 50–53.

WORKSHEET 6

Date: _____

Name: _____

1. Choose the correct word to complete each of the sentences below.

- i. The land surface of the Earth and the ocean floor are made of solid material called _____ (rocks, lava, sea).
- ii. The word _____ means fire in the old Latin language (water, earth, fire).
- iii. The surface of the Earth has become _____ in the last four billion years (broken, cool, wider).
- iv. The most common and important igneous rock is _____.(feldspar, granite, calcite).

2. Why are rocks created by the action of magma and lava called igneous rocks?

SECTION 2

SEDIMENTARY ROCKS

Answer key

Questions and Activities

1. mechanically formed, chemically formed, organically formed
2. Weathering breaks down rocks physically over a long period of time; water reacts with chemicals to break rocks down.
3. Limestone is formed when calcium carbonate dissolves in water to form carbonic acid, a weak acid that reacts with rock to break it down.
4. Coal=organic, coral=organic, salt=chemical, sandstone=mechanical, conglomerate=mechanical

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 54–56

Teaching objectives:

- to inform students about different kinds of sedimentary rocks that make up the Earth's surface
- to explain the formation process of sedimentary rocks

Learning outcome:

Students should know what sedimentary rocks are and how they are formed.

Introduction (5 minutes):

Recap previous lesson (igneous rocks). Introduce sedimentary rocks.

Explanation (30 minutes):

Use text pages 54–56 to explain what sedimentary rocks are and why they are important. Name and describe the processes by which sedimentary rocks are formed. Highlight the differences between the three processes.

Conclusion (5 minutes):

Recap key points of the lesson. Ask short questions to check understanding.

WORKSHEET 7

Date: _____

Name: _____

1. Choose the correct word to complete each of the sentences below.

- i. The word 'sedimentary' is from the Latin word *sedimentum* which means _____ (press down, settle down, move down).
- ii. Sedimentary rocks are formed in layers or beds called _____ (strata, solidification, particles).
- iii. Weathering breaks up larger bits of rocks into _____ (fragments, lakes, cement).
- iv. Huge salt deposits are found in the Salt Range in _____ Pakistan (Jhelum, Khewra, Sialkot).
- v. Deposits of plant remains in swamps are called _____ (coal, organics, peat).

2. Answer the questions.

- a. Explain the difference between sedimentary rocks and igneous rocks.

- b. Explain the following:

- i. lithified

ii. solidification

iii. extract

3. Make a list of sedimentary rocks under the following headings:

Mechanically formed	Chemically formed	Organically formed

SECTION 3

METAMORPHIC ROCKS

Answer key

Questions and Activities

1. to change
2. heat and pressure; they bring about changes in the rock
3. schist, slate, marble

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 57–58

Teaching objectives:

- to explain to students the different kinds of metamorphic rocks that make up the Earth's surface
- to explain the formation process of metamorphic rocks

Learning outcome:

Students should be able to explain what metamorphic rocks are and how they are formed..

Introduction (5 minutes):

Recap previous lessons (igneous rocks and sedimentary rocks). Introduce metamorphic rocks.

Explanation (20 minutes):

Use the textbook, pages 57–58 to explain what metamorphic rocks are and why they are significant. Name and describe the agents of metamorphism and how they form metamorphic rocks. Highlight the difference between physical and thermal metamorphism.

Conclusion (10 minutes):

Recap key points of the lesson. Ask short questions to check understanding. Compare with igneous and sedimentary rocks.

WORKSHEET 8

Date: _____

Name: _____

1. What is thermal metamorphism?

2. What is physical metamorphism?

3. Draw a diagram to show the process of metamorphism in rock formation.

Chapter 5

Major land features

SECTION 1

MOUNTAINS

Teacher's focus:

Land features or landforms are the different features that make up the Earth's surface. Land features determine natural environments and habitats and affect human and other life. In turn, they are also affected by human population and activities.

Mountains, hills, plains, plateaus, deserts, and rivers are the most important landforms. They regulate water and food supply and temperatures of a region. Looking after these natural resources is every human's duty.

Land that rises over 300 m is called a mountain. High land less than 300 m is called a hill. Mountain tops are called peaks. Mountains are nature's loftiest and most majestic landforms and are also very important for human life. They add to the scenic beauty of a place, cause rain, and regulate temperature. Glaciers from mountains melt to form rivers which provide drinking water. In addition, leisure activities like mountain climbing, paragliding, skiing, hiking, and trekking promote tourism and provide entertainment and exercise for people.

Mountains exist either as single or lone mountains or in chains called mountain ranges. There are three kinds of mountains: fold mountains, block mountains, and volcanic mountains. This division has been made based on the process of their formation.

The Earth's crust is comprised of small pieces called plates, which look like a crushed eggshell. The plates float on magma below the crust and move slowly in three directions: towards each other, away from each other, and in the same direction. When two plates push or collide into each other, the land rises into folds and forms high land. Such mountains are called fold mountains. The Andes, Alps, Rockies, and Himalayas are examples of fold mountain ranges.

Block mountains are formed as a result of the uplifting of the Earth's crust when it is pushed between fault lines. A new block of land is pushed up from between the rift or gap. Such a mountain is called a horst block or block mountain. A valley between such mountains is called a rift valley.

Volcanic mountains are formed by volcanic activity and the hardening and cooling of lava into a cone-like figure. Some famous volcanic mountains are Mount Etna in Sicily, Mount Egmont in New Zealand, and Mount Fuji in Japan. Volcanic mountains that have not erupted recently are called dormant. Mountains with recent and frequent eruptions are called active. Mountains that have not erupted for more than 50 years and are likely not to erupt again are said to be dead. The area around the Pacific Ocean is called the Ring of Fire because the world's most active volcanoes are located there.

Answer key

Questions and Activities

1. mountains, plains, plateaus, deserts, rivers
2. Mountains are high relief land. Fold—Andes, Alps, Himalayas, Rockies.
Fault and block—mountains of East Africa and Nevada
Volcanic—Mount Egmont, Mount Kilimanjaro, Mount Fuji, Mount Etna
3. When two plates push into each other, they cause the land to rise in folds, forming fold mountains.
4. A lake formed due to an enlarged crater; when rain water collects in it
5. i. Asia ii. fold iii. middle iv. tectonic force v. rift
6. i. fault ii. volcano iii. crater iv. vent
v. Mount Etna vi. Mount Fuji vii. Mount Kilimanjaro

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 60–64

Teaching objective:

- to explain the formation and significance of some major landforms of the Earth such as mountains, plains, plateaus, deserts, and rivers

Learning outcome:

Students should be able to understand how these landforms are formed. They should also be made aware of why landforms are so important for human life and the responsibilities of humans for looking after these landforms.

Introduction (5 minutes):

Ask students if they have been to a hill station or mountain resort. If yes, talk about their observation on temperature, the way people dressed, the food they had, etc. Introduce the lesson.

Explanation (30 minutes):

Read and explain text pages 60–64. Highlight the specific words included in the text to explain mountains and mountain formation.

Conclusion (5 minutes):

Review the key concepts by summarizing the text and asking short questions.

WORKSHEET 9

Date: _____

Name: _____

1. Choose the correct word to complete each of the sentences below.

- i. Mountains, hills and _____ are high relief land whereas plains are low relief (plateaus, rivers, deserts).
- ii. Mountains have an uneven _____ surface, broad at the bottom and narrow at the top (flat, sloping, drooping).
- iii. When two plates push into each other, they form _____ mountains (conical, table, fold).
- iv. Block mountains are formed as a result of the _____ of the Earth's crust when it is pushed up between two fault lines (rising, uplifting, widening).
- v. Volcanoes are usually _____ shaped mountains (round, crater, cone)

2. Research:

- i. Find out the most recent volcanic eruptions.

- ii. What is the Ring of Fire?

- iii. What risk do the people living here face?

SECTION 2

PLATEAUS, PLAINS, AND DESERTS

Teacher's focus:

Plateaus are an unusual landform. They are mountains with flat peaks, just like a table, which is why they are also called table lands. They are usually surrounded by high land on one or more sides. These flat peaks are a flat land good for cultivation. There are different kinds of plateaus found in different parts of the world.

Plains are flat land near sea level. They are low relief. Plains are usually found along river banks and are the most fertile landforms because of the rich alluvial deposits.

Deserts are dry land with little or no rainfall throughout the year. The temperatures are extreme – from scorching hot during the day to freezing cold during the night.

Answer key

Questions and Activities

1. They are called tablelands because of their flat, raised surfaces with steep sides on one or more sides.
2. Uplifted—central plateau of France, plateau of western Australia, Columbian plateau in South America. Intermontaine—Tibetan plateau between the Himalayan Range and the Kun Lun Shan range in China, the Anatolian plateau in Turkey. Piedmont—plateaus along the Andes Mountains in South America and the Potwar or Potohar plateau in Pakistan. Volcanic or lava—Deccan plateau, India.
3. Sediment is deposited on lowlands in three ways: rivers carry eroded rock from high land and deposit it on low land; winds blow fine sediment over long distances and deposits it on the ground; glaciers transport eroded rock fragments and when the ice melts, the fragments are deposited on the ground.
4. alluvial, loess and till
5. A natural pool or source of water in a desert formed when rainwater or underground sweet water collects in a depression
6. They are flat and fertile and have all the essentials for farming.
7. Fleshy leaves, long roots and very little requirement for water.
8. i. intermontaine ii. alluvium iii. piedmont iv. fine sediment v. glaciers

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 66–70

Teaching objective:

- to explain what plateaus, plains, and deserts are and how they are different in terms of location, formation, temperature, and vegetation.

Learning outcome:

Students should be able to understand the nature and formation of each landform.

Introduction (5 minutes):

Write the names of the three landforms in three columns on the board and ask students if they have heard these names before. Introduce the topic.

Explanation (30 minutes):

Use the text pages 66–67 and the illustrations on these pages as support to explain what plateaus are. Read and explain pages 68–69 on plains and deserts. Write down the features of each landform in the correct column.

Conclusion (5 minutes):

Review the topic by highlighting key points. Refer to the characteristics in the columns on the board.

Homework: Revise pages 66–70

Classwork: Questions 1–8 on page 70

SECTION 3

RIVERS

Teacher's focus:

Rivers are bodies of water that flow usually from a high land, towards the sea, with the pull of gravity. The only exception to this is the River Nile that flows upwards from its source in the White Nile and Blue Nile, towards the Nile Delta. It drains into the Mediterranean Sea.

A river has its sources (point of origin) in (a) rainwater, (b) springs (c) lakes, and (d) snow and glaciers on mountains. Most rivers drain into seas. The place where the river meets the sea is called its mouth or estuary. Sometimes a river may split up into different channels and deposit silt at the mouth, forming forked, triangular piece of land called delta. Estuaries and deltas are a natural habitat for a variety of plants and animals. The water here is a mixture of sweet water from the river and salt water from the sea.

A river flows fastest near its source or its slopes. The pressure from the flow of water causes erosion and carves out a variety of landforms like valleys, ravines, gorges, and oxbow lakes and can push heavy boulders, trees, or anything that comes in the way. This is because it has the most energy while flowing down a slope. It

DISCOVERY 1

Teaching Guide

slows down in the middle of its journey, when the river reaches the end of the slope. In this part of its journey, a river can only push smaller rocks or stones. Finally, when the river reaches flat land, it slows down completely and carries only soluble material such as silt, small stones, and gravel. This happens near the mouth of the river, just before draining into the sea.

Rivers are important for humans because they provide drinking water, water for agriculture, cultivation, and cleaning purposes. Rivers are also a good source of food, as river fish are edible and nutritious and animals that come down to river banks for water can also be hunted for food. Rivers are a means of transportation and can be used for leisure activities such as river cruises.

Answer key

Questions and Activities

1. A river is a moving body of water that flows along a channel and moves downhill under the force of gravity. It is formed when rain falls or snow melts and the flowing water erodes the weak rocks to form a waterway.
2. Agree. Rivers meet the sea, and the water from rivers enters the seas. Thus it is said that rivers feed the sea. The river's journey begins at its source which may be a lake, glacier, rainwater or another river, usually in the mountains. In its youth, it flows the fastest because it flows down steep river slopes. The most erosion takes place in this period. In its mature stage, its speed slows down because it reaches the plains. Most deposition takes part in this stage as the river is unable to carry load. In its old or last stage, the river flows the slowest and deposits what little silt it has near the mouth of the river where it meets the sea. Sometimes it splits into smaller channels following a triangular piece of land called delta.
3. They provide water for drinking and other major human activities including agriculture, cleaning and hygiene, fishing, travel.
4. An oxbow lake is a cut off meander, formed when the river deposits silt and other sedimentary material at the banks of the river during a sharp bend. This causes part of the bend to get cut off and there is no supply of fresh water.
5. i. Nile ii. Amazon iii. Indus
6. i. meander ii. rivers iii. Himalayas iv. silt v. Sudan and Egypt

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 71–73

Teaching objectives:

- to provide names of and information about some important rivers of the world
- to explain what rivers are and why they are important for life

Learning outcome:

Students should know what rivers are and retain facts about some rivers of the world.

Introduction and explanation (35 minutes):

Read and discuss text on page 71 and explain content.

Conclusion (5 minutes):

Recap lesson.

WORKSHEET 10

Date: _____

Name: _____

Research

1. Complete the table below.

River	Country	Source	Length	Estuary/ Delta	Drains into
Indus					
Amazon					
Mississippi					
Yangtze					
Murray-Darling					
Danube					
Nile					
Ganges					
Brahmaputra					

2. Define the following terms:

source

delta

estuary

oxbow lake

valley

floodplain

tributary

Chapter 6

Landscapes of Pakistan

SECTION 1

MOUNTAINS

Teacher's focus:

In the previous chapter, students have already learnt what landscapes are. They will now apply those concepts to the landscapes of Pakistan.

Pakistan is home to three of the world's greatest mountain ranges: the Himalayas, the Kakarkoram Range and the Hindukush Range. The junction of all three mountains is Astore, Gilgit-Baltistan. This is also the confluence of Indus and Gilgit rivers.

Answer key

Questions and Activities

1. Map activity
2. K2
3. Mountain passes connect places and allow people to pass through; Khyber Pass, Babusar, Bolan, Khunjerab, Karakoram
4. A glacier is a slow-moving mass of ice, formed by compressed snow. Siachen Glacier, Biafo Glacier.
5. i. False ii. True iii. False iv. True
v. False vi. True vii. True viii. False

6.		Name	Landform	Name	Landform
		Babusar	pass	Biafo	glacier
		Tirch Mir	mountain range	Sulaiman-Kirthar	mountain range
		Himalayas	mountain range	Nanga Parbat	mountain range
		Saiful Muluk	lake	Satpara	lake
		Khunjerab	pass	Siachen	glacier

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 76–77 and *Oxford School Atlas for Pakistan*

Teaching objective:

- to inform students about the mountain system of Pakistan and its significance, and to highlight its salient features

Learning outcome:

Students should be able to relate to facts about the mountains of Pakistan.

Introduction (5 minutes):

If possible, get some brochures of the northern areas from a local travel agency or the nearest PTDC centre. This will help build up interest in the lesson. Open the atlas to the page with the physical map of Pakistan. Using the key, locate and mark some mountain ranges on the map. Discuss the data provided in the key. Link the map to the concepts learned in Chapter 2.

Explanation (30 minutes):

If possible, show this website: <http://www.pakistangeographic.com/mountains.html>
<http://www.hunzaadventuretours.com/mountains-in-pakistan.html>

Read and explain text pages 76–77. Make students underline important facts.

Conclusion (5 minutes):

Sum up lesson.

Worksheet: This is a research based activity and students can use additional sheets to incorporate the information they find. Alternatively, this can be turned into a group project, with students making charts that can be displayed in the classroom.

WORKSHEET 11

Date: _____

Name: _____

1. Collect information about the following:

Nanga Parbat

Shigar

Skardu

Concordia

Baltoro, Hispar, Siachen

Pamirs

K2

Astore

Gilgit Baltistan

Tirich Mir valley

Baroghil, Khyber, Khunjerab

Saiful Muluk and Satpara lakes

2. Which mountain range has the highest peaks in Pakistan?

SECTION 2

PLATEAUS, PLAINS, AND DESERTS

Teacher's focus:

Refer to the notes on Plateaus, Plains, and Deserts in chapter 5. Revise the key concepts from the lesson.

Answer key

Questions and Activities

- The Plateau Potwar is located between the rivers Indus and Jhelum. Rawalpindi, Islamabad, and Chakwal are located here. It is bounded by the Margalla Hills in the north and the Salt Range in the south. The height is 900 m. The Balochistan Plateau is located in the west of the Sulaiman-Kirthar range and it is covered with hills and mountains. It is bounded by the Sulaiman and Toba Kakar ranges in the north and the Kalat Plateau in the south.
- Plains are located in the eastern part of Pakistan, mostly on the riverbanks/floodplains of the Indus and its tributaries. They are the heart of Pakistan's agriculture.
- For trade and travel by sea
- Karachi Port, Port Qasim, Gwadar
- i. two ii. Punjab iii. Soan iv. west v. eastern vi. Rajasthan
- Thal Desert in Punjab, Kharan Desert in Balochistan.
- Sindh

8.

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

Lesson Plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 78–80

Teaching objective:

- to inform students about the plateaus, plains, and deserts of Pakistan

Learning outcome:

Students should be able to understand the location, features, and significance of these landforms.

Introduction (5 minutes):

Begin the lesson by asking students if they have seen any of the landforms of Pakistan or been to Punjab by motorway and seen Chakwal, Rawalpindi, and Islamabad. Give a brief summary of the topic.

Explanation (30 minutes):

Read and explain pages 79–80. Make students underline key data. Try and show slideshows or video clips about these landforms.

Conclusion (5 minutes):

Sum up the main points of the lesson.

Homework: Questions 1–5 on page 81

Activity:

Have a project display. Work with students to make models of the landforms. They can use recyclable materials like old cartons, brown bags, etc. to make the projects.

SECTION 3

RIVERS OF PAKISTAN

Teacher's focus:

Pakistan shares its river system with India. The source of the River Indus is Lake Mansarowar near Tibet in the Himalayas. From there, the Indus then flows southwards through India and Pakistan, forming its estuary, a delta in the Arabian Sea near Karachi. It completes most of its journey through Pakistan. The main tributaries are Ravi, Chenab, Sutlej, Beas, and Jhelum. Smaller tributaries include the Kabul River. All the rivers meet at Punjnad, the confluence, and start flowing as one River Indus.

River Indus is Pakistan's primary source of water for drinking and agriculture. It is also home to rare wildlife

DISCOVERY 1

Teaching Guide

such as the Blind Dolphin. River cruises, swimming, fishing, and picnics along the banks of the Indus are some leisure activities that people enjoy.

Answer key

Questions and Activities

1. It is Pakistan's chief source of water.
2. It begins at Lake Mansarowar in the Himalayas and ends at the Arabian Sea near Karachi and Thatta (Indus Delta).
3. Rivers provide water for drinking, agriculture, building dams and generating electricity.
4.

i. Himalayan	ii. Jhelum, Chenab, Ravi, Sutlej
iii. store, irrigation	iv. Porali, Hingol, Dasht, Hub
v. Jhelum, Tarbela, Warsak	

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 81–82, *Oxford School Atlas for Pakistan*

Teaching objective:

- to inform students about the journey of the River Indus and its significance for life in Pakistan

Learning outcome:

Students should be able to understand the importance of the river as one of the major river systems of the world and retain facts about it.

Introduction (5 minutes):

Use the physical map of Pakistan in the *Oxford School Atlas for Pakistan*. Show students the blue line for the river and make them trace the journey from the Himalayas to the Arabian Sea.

Explanation (30 minutes):

Read and explain text page 81–82.

Conclusion (5 minutes):

Ask short questions to check understanding.

Classwork: Questions 1–4 on page 83

Homework: Activity a and b on page 83

WORKSHEET 12

Date: _____

Name: _____

1. Choose the correct word to complete each of the sentences below.

- i. Pakistan is the land of River _____ (Chenab, Indus, Ravi).
- ii. River Indus rises in the _____ (Himalayas, Karakoram, Hindukush).
- iii. The main western tributary of river Indus is the _____ River (Ganges, Swat, Kabul).
- iv. Punjnad is the confluence of all the tributaries of the River Indus. It is located in _____ (Chakwal, Mithankot, Umerkot).
- v. Many rivers have _____ constructed for storing water and generating electricity (dams, barrages, power plants).

2. What are perennial rivers? Name them.

3. Write details about the journey of the Indus from its source till its end.

Chapter 7

World population

SECTION 1

DISTRIBUTION AND DENSITY

Teacher's focus:

The term "population" refers to the number of people living in a specified area, for example the population of a continent, country, city, village, town, neighbourhood, etc. Population is not a static figure and changes over time. The increase or decrease of population depends on many factors like migration, births and deaths, law and order situation of that place, basic facilities, etc.

Population distribution refers to the pattern in which people are spread over an area. The population distribution on the Earth is not equal as all parts of the world are not equally suitable for human inhabitation. Population density is the number of people living per square kilometre. Some settlements have more people living in a smaller area and such an area is said to have a high density population, whereas some regions are large and have fewer people living there and are said to have a low density population.

The study of population is called demography. It is based on the study and analysis of demographic factors like the age and sex structure of populations, migration, and other physical, social and environmental factors. Demography is a useful tool in the development of a country as it helps to identify population trends and problems, provides information about the availability and utilization of resources and other important data and statistics.

Answer key

Questions and Activities

1. The world's population is not evenly distributed due to physical, natural and migratory factors. Some areas are heavily populated, some are moderately populated and some are low populated.
2. (figures in the data table will have changed)
3. Number of people living per square kilometer or square mile.
High population density: areas with more than 50 people per square mile or km, include Europe, east and west coasts of the USA, South Asia and South-east Asia, China, India, North Africa, Turkey
Low population density: one person per square mile or km, includes uninhabitable areas like deserts (Sahara and Gobi), Antarctica, mountainous areas and rainforests.

4. Some places are not liveable due to physical or geographical conditions, natural conditions and human or migratory conditions
5. high birth rates, high life expectancy, migration
6. Children: humans under 15 years
Adults: humans between 15-65 years
Aged or old: above 65
Children: 30%, adults: 63%, aged: 7%
7. People move for better jobs and higher standard of living, away from wars, natural disasters, diseases and epidemics, threats of terrorism, lack of facilities.
International migration: moving from one country to another
Internal migration: moving from one place to another within the same country
8.

i. low distribution	ii. river plains, grasslands, cities
iii. age structure	iv. children, adults and aged
v. adult group	vi. migration

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 84–90

Teaching objective:

- to inform students about the study of population and its uses

Learning outcome:

Students should be able to understand various terms used in demographics and the importance of the effect of population on a country and its resources.

Introduction (5 minutes):

Ask students to observe the number of people in different classes including the staff room and principal's office. What can they observe in terms of number of people? Then ask them to compare the sizes and number of children in different classes. Talk to them about the number of people living in houses and apartments. What do they observe?

Explanation (30 minutes):

Using the observation in the introduction, read and explain text pages 84–90.

Conclusion (5 minutes):

Sum up chapter with review of key concepts.

SECTION 2

THE POPULATION OF PAKISTAN

Teacher's focus:

This section is about the demographics of Pakistan. It has to be understood in the light of the concepts in the previous lesson. It contains information and data that students need to retain.

Answer key

Questions and Activities

1. Pakistan has an uneven distribution of population. Balochistan is the largest in terms of area but smallest in terms of population and Punjab is the smaller in terms of area but the has largest number of people.
2. Balochistan=44% of total area, 5% of population, Punjab=28.5% of total area, 25.8% of population, Sindh=17.7% of land, 23% of population, Khyber Pukhtunkhwa=9.4% of total area, 13% of population, FATA=3.4% of total area, 2% of population
3. more facilities, job opportunities, medical facilities, chance for better lifestyle
4. Lack of resources, overuse of land and housing problems, food shortages, traffic problems, pollution.
5. i. density ii. Asia iii. density iv. uninhabited v. 50
vi. sixth vii. Balochistan viii. Indus ix. rural x. rural

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 91–94

Teaching objective:

- to teach students about the population of Pakistan

Learning outcome:

Students should know the current population of Pakistan, its growth trends, density, and distribution and other related demographic data.

Introduction (5 minutes):

Talk about the increasing traffic jams and congestion on roads and the rush at shopping centers. Compare this with the crowd at a beach.

Explanation (30 minutes)

Read and explain text pages 92–95. As you discuss and explain, keep giving examples and making connections with what is happening around your city in terms of population growth.

Conclusion (5 minutes):

Review chapter by summing up main points and making the students mark important information.

Homework: Questions 1–8 on pages 95–96

Worksheet: Question 4 and the Activity on page 95 can be done as a worksheet.

Chapter 8

Human settlements

SECTION 1

TYPES OF SETTLEMENTS

Teacher's focus:

As the name suggests, a settlement is a place where people have settled for long-term residence. When people decide to look for a place to settle, they look at many features, out of which the most important is the availability of food, water, and shelter. Geographical factors such as land height and suitable climate are also important, as it was mentioned earlier that some places are not inhabitable because of the unpleasant climate. Infrastructure such as medical facilities, safety and security, schools, opportunities to earn a living, transport, and other basic needs are also a vital part of settlements. People also consider the availability of places of worship, leisure and recreational areas, natural and man-made features like lakes and ponds, etc.

Settlements are of different sizes. They may vary from scattered dwellings and small hamlets to megacities. Urban and rural settlements (cities and villages) are characterized by their population—the number of people, education and educational institutions, race and ethnicity, nature of jobs and professions, availability of infrastructure, modern facilities and technology, etc.

Answer key

Questions and Activities

1. The earliest humans were wanderers, hunter-gatherers. With time they learnt farming and began setting near places, with water resources.
2. Availability of basic facilities, ease of construction on flat sites, cheaper construction, fewer risks of disasters like flooding
3. Major cities and villages or urban and rural settlements. Types of settlements: isolated dwellings, hamlets, villages, towns, cities, metropolis and mega cities.
4. Hamlet: generally 2-5 houses. Village: larger than hamlet with more houses, a primary school, hospital, post office etc. Towns: larger than villages and smaller than cities with markets, a small hospital, schools, colleges and a few factories
5. Urban settlements: large settlement, city life, people working in offices, government offices, and industries, complex and busy life, more facilities. Rural settlements: small settlement, village life, most people farmers and agriculture the main occupation, simple life, few basic facilities

DISCOVERY 1

Teaching Guide

6. Cities play different roles in the progress and development of a country on the basis of what they have to offer in terms of development.
7. i. settlement ii. wanderers iii. site iv. level, easier v. urban
vi. isolated vii. city viii. megacities ix. administrative x. hamlet
8. Isolated dwelling, hamlet, village, town, city, metropolitan, megacity

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 97–100

Teaching objective:

- to inform students about the different types of settlements and the factors that lead to settlements

Learning outcome:

Students should be able to understand different kinds of settlements and their characteristics.

Introduction (5 minutes):

Discuss your village/town/city with the students. Make a list of facilities it has. Ask students what they would look for while buying a house or moving to a new place.

Explanation (30 minutes):

Read and explain text pages 98–100. Refer to points discussed in introduction.

Conclusion (5 minutes):

Sum up key points of lesson by asking short questions.

Homework: Questions 1–5 on page 101

SECTION 2

IMPORTANT CITIES

Teacher's focus:

Cities play an important role in the development of a country. Megacities are centres of urban living and contribute to the growth and prosperity of a nation in different ways. Megacities have abundant job opportunities, medical facilities, educational institutions, industries, infrastructure and technology, business and trade development.

However, living in megacities also has its disadvantages. Over population, , high crime rates, higher cost of living, traffic jams, high rise buildings and more built-up area, congested roads, scarcity of land, fewer natural landscapes, pollution, scarcity of natural resources like water, etc. are some issues that residents of cities face.

Answer key

Questions and Activities

1. Cities that are multinational business and financial centers of the world.
2. important ones are Karachi, London, Tokyo, New York, Dubai, Makkah, Shanghai, Seoul and Mumbai.
3. Over population, migrating in large numbers, high crime rates, higher cost of living, traffic jams, high rise buildings and more built-up area, congested roads, scarcity of land, fewer natural landscapes, pollution, scarcity of natural resources like water, etc are some issues that residents of cities, metropolitans and megacities face.
4. open question—mark in the light of text
5. i. megacities ii. largest iii. Arabian Sea iv. Mumbai v. port

Lesson plan

No of lessons: 1

Duration: 40 minutes

Resources: Textbook pages 102–104

Teaching objective:

- to familiarize students with some megacities of the world, and to show their benefits and problems

Learning outcome:

Students should be able to understand the concept of megacities and the advantages and threats of living in a megacity.

Introduction (5 minutes):

Ask students if they have been to Karachi, Makkah, and/or any other megacity. What did they observe in terms of population and development? How did they feel while living there?

Explanation (30 minutes):

Read through pages 102–105 and explain the content. Ask students to underline or highlight important information about each megacity.

Conclusion (5 minutes):

Ask short questions to recap the lesson and test students' understanding of the concepts.

WORKSHEET 14

Date: _____

Name: _____

1. Find out information about the following megacities.

i. New Delhi

ii. Dhaka

iii. Jakarta

iv. Sao Paulo

v. Cairo

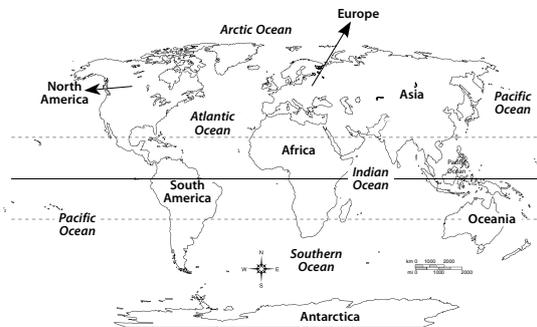
Answer key for worksheets

Worksheet 1

- static body
 - rotates
 - equal
 - Arctic, Antarctic.
- 24
- Diagrams in the *Oxford School Atlas for Pakistan*

Worksheet 2

- World continents and oceans



- continents
 - 71
 - Oceania
 - Asia
 - Mount Everest
 - Mariana Trench
 - Antartica
 - Pacific
 - Atlantic
 - elevated
- Northern Hemisphere: 61% water, 39% land
Southern Hemisphere: 81% water, 19% land

Worksheet 3

- Study of mapmaking
- pilot: navigation, tourist: getting directions and finding places, student: understanding atlases and getting information about places

Worksheet 4

- Answers in index of *Oxford School Atlas for Pakistan*.
- student: will help in understanding climatic zones and time zones, will help if they choose a related career,
teacher: will help in better understanding of the topic which will be beneficial for students in their later lives if they decide to take up a profession related to this field,
pilot: help with navigation,
travel agency: help in advising their clients about where to go, how to travel, etc.

Worksheet 5

- evaporation
 - radiation
 - litho
 - crust
 - water
- Because the Greeks were the first to study geography and come up with answers

DISCOVERY 1

Teaching Guide

- ii. Oceans, seas, freshwater sources like rivers, glaciers and lakes
- iii. Timber—paper, furniture, handicrafts, pencils

Worksheet 6

1. i. rocks ii. fire iii. cool iv. granite
2. Because igneous comes from the word *ignis* which means fire. Since magma and lava are as hot as fire, igneous rocks have been named thus.

Worksheet 7

1. i. settle down ii. strata iii. fragments iv. Khewra v. peat
2. a) Sedimentary rocks: formed when pieces of rocks exposed to the surface of the Earth settle down in layers. Igneous rocks: formed when lava cools and hardens.
b) i. Lithified: turned into stone ii. Solidification: become solid and harden
 iii. Extract: to take out
3. Mechanically formed: shale, sandstone, siltstone and conglomerate
 Chemically formed: gypsum, salt stone, limestone
 Organically formed: coral reef; coal

Worksheet 8

1. Change in rocks due to heat because they are in contact with new magma
2. Change in rocks due to compressional forces or pressure of overlain rocks
3. Diagram in book

Worksheet 9

1. i. plateaus ii. sloping iii. fold iv. uplifting v. cone
2. i. Mount Etna in 2012, Kelud in 2014, Sangeang Api in 2014
 ii. The area around the Pacific Ocean where most of the world's most active volcanoes are located
 iii. Earthquakes and volcanic eruptions

Worksheet 10 – Research

River	Country	Source	Length	Estuary/Delta	Drains into
Indus	Pakistan, India, Tibet	Lake Mansarowar in the Himalayas	3200 km	Near Thatta and Karachi	Arabian Sea
Amazon	Peru, Brazil Colombia, Ecuador, Bolivia and Venezuela	Andes in Peru	5437 km	Near Atlantic Ocean	Atlantic Ocean
Mississippi	United States of America	Lake Itasca, Minnesota	3766 km	Gulf of Mexico	Gulf of Mexico
Murray-Darling	Australia	Australian Alps	2508 km	Murray Mouth	Indian Ocean

Danube	Austria, Romania, Bulgaria, Slovakia, Hungary, Ukraine, Croatia, Germany, Serbia, Moldova	Black Forest, Germany	2860 km	Black Sea	Black Sea
Nile	Egypt, Congo, Sudan, Tanzania, Rwanda	White Nile and Blue Nile	6650 km	Nile Delta	Mediterranean Sea
Ganges	India, Bangladesh	Mountains and glaciers of the Himalayan range in India	2525 km	Ganges-Brahmaputra delta stretching from the Hoogly river to the Meghna river	Bay of Bengal
Brahmaputra	Bangladesh, India, China	Himalayas	2900 km	Ganges-Brahmaputra delta stretching from the Hoogly river to the Meghna river	Bay of Bengal

delta : a triangular piece of land formed when the river splits into several channels before draining into the sea.

estuary: the mouth of the river where it meets the sea

floodplain: fertile land created along river banks due to deposition of silt during flooding

oxbow lake: a meander or a river bend that gets cut off from the river due to obstacles. It contains stagnant water and usually dries up soon because there is no fresh water supply

source: the place from where a river begins

tributary: a smaller river that joins a main river

valley: low lying, u or v shaped area between two mountains

Worksheet 11

Nanga Parbat : ninth highest mountain of the world, located in the Gilgit Baltistan region. Part of the Himalayan range

Shigar: a town of the Gilgit Baltistan region with a fort and river named after it. A popular tourist resort as well.

Skardu: a city in the Skardu district of Gilgit Baltistan, at the confluence of the Indus and Shigar rivers.

Concordia: confluence of Baltoro and K2 glacier

Baltoro, Hispar, Siachen : glaciers

Pamirs: mountain range of Central Asia at the junction of Karakoram, Hindukush, Tian Shan and Kun Lun ranges

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K2: Second highest mountain peak of the world and highest in Pakistan, located in the Karakoram Range. Also known as Godwin Austen

Astore: a valley, the junction of the Himalayas, Hindukush and Karakorams

Gilgit Baltistan: The northernmost area of Pakistan, home to three of the world's grandest mountain ranges and some of the world's mightiest peaks.

Tirich Mir valley: the side valley of Tirich Mir, the highest mountain range of the Karakorams

Baroghil, Khyber, Khunjerab: mountain passes

Saiful Muluk and Satpara: mountain lakes. Saiful Muluk is in Naran. Satpara or Sadpara lake is in Skardu.

Mountains ranges: Himalayas, Karakoram, Hindukush, Pamirs

Mountain peaks: K2, Nanga Parbat, Rakaposhi, Gasherbrum, Masherbrum

Rivers: Indus, Ravi, Chenab, Sutlej, Jhelum, Beas

Plateaus: Potohar, Balochistan, Deosai Plains

Deserts: Thar, Thal, Cholistan

Glaciers: Baltoro, Hispar, Siachen, Biafo

Mountain lakes: Saiful Mulook, Satpara, Mahodand

Other lakes: Keenjhar/Kalri, Haleji, Hanna, Rawal

2. Himalayas

Worksheet 12

- i. Indus ii. Himalayas iii. Kabul iv. Mithankot v. dams
- Seasonal rivers that flow during rainy season and then dry up. River Zhob
- Major river in Asia. Shares its source Lake Mansarowar in the Himalayas with India and Tibet but completes its journey through Pakistan. From Mansarowar, it runs through Ladakh in Kashmir, towards Gilgit Baltistan. From here, it continues its southward journey through the plains of Punjab, meeting its tributaries at Punjnad before flowing down through Sindh, and finally into the Arabian Sea.

Worksheet 13

Open question—mark students on the basis of sensibility and relevance of answers.

Worksheet 14

- i. New Delhi: capital of India, population over 11 million (2011 statistics), home to a mix of cultures, ethnicities and religions.
- ii. Dhaka: capital of Dhaka, population more than 15 million, economic and business hub, advancements in technology and communication, prone to severe floods, polluted and over populated, cycle rickshaws.
- iii. Jakarta: capital of Indonesia, population of over 9 million, economic, cultural and political centre, trading port, native Indonesians.
- iv. Sao Paulo: largest city of Brazil, population above 11 million, home to world's finest business centers, hotels and carnivals, business and economic hub, strong cultural values in people.
- v. Cairo: capital of Egypt, largest city of the Middle East and Africa, population around 7 million, city of culture and architecture.

