

CLASS 9 SOCIAL SCIENCE

Chapter 2: Shaping of the Earth's Surface

Competency-Based Questions (CBQs)

Answer each question by applying the concepts from the chapter. Answers are provided at the end for revision.

1. Tectonic Plate Collision

A town lies close to the boundary where two continental tectonic plates are moving towards each other.

- (a) Identify the type of plate boundary.
- (b) Explain how the mountain ranges may form.
- (c) Why can earthquakes occur in this region?

2. Plate Boundaries and Natural Hazards

Scientists compare a map of tectonic plates with maps showing earthquakes and volcanoes. They find that many events occur near plate edges, particularly around the Pacific Ocean.

- (a) What does this pattern suggest about the relationship between plate boundaries and natural hazards?
- (b) Name the region around the Pacific Ocean associated with frequent earthquakes and volcanoes.
- (c) State one practical use of understanding this pattern.

3. Weathering and Erosion

After a cold night, cracks appear in a rock. Over time, fragments break away, but they remain at the same place until water or wind carries them elsewhere.

- (a) Name the process that breaks the rock into smaller pieces.
- (b) Is the movement of material necessary for this process?
- (c) How is this process different from erosion?

4. Waterfall Formation

A river flows over a hard rock layer. The softer rock beneath it wears away more quickly, leaving a steep drop. Water plunges into a hollow at the base.

- (a) Identify the landform.
- (b) What is the hollow at the base commonly called?
- (c) Give one way this landform may be useful to people.

5. Meanders and Oxbow Lakes

A river develops a large winding bend in its middle course. The river erodes one bank and deposits material along another. Later, the bend becomes cut off from the main river.

- (a) What is the winding bend called?
- (b) Which two processes help shape it?
- (c) What may the cut-off bend form?

6. Delta Formation

At the mouth of a river, the flow slows down and sediments accumulate, gradually building new land. The area supports farming and settlements but may also face flooding.

- (a) Identify the landform described.
- (b) Why does deposition take place near the river mouth?
- (c) State one benefit and one risk for people living there.

7. Coastal Landforms

Waves repeatedly strike a rocky coast. Small cracks become larger openings; some openings eventually pass through a headland, and the unsupported rock beyond may collapse.

- (a) Name the coastal landform formed when a cave passes through a headland.
- (b) What landform may remain after the arch collapses?
- (c) Which agent is mainly responsible for shaping these features?

8. Glacial Valleys

A glacier moves through a mountain valley. After the ice melts, the valley has a broad floor and steep sides. Smaller valleys may enter it from a higher level.

- (a) Identify the main valley shape.
- (b) Name the smaller valley that enters it from a higher level.
- (c) Which agent of gradation formed these landforms?

9. Wind Erosion

In a dry region, strong winds lift and carry loose sand and soil. Exposed rocks become polished, and streamlined ridges develop where softer rock is worn away more quickly than harder rock.

- (a) Name the process by which wind removes loose particles.
- (b) What are rocks polished and shaped by wind-blown sand called?
- (c) What are streamlined ridges carved by wind called?

10. Karst Topography

Rainwater enters cracks in limestone. Over a long period, underground passages and caves develop. Some mineral deposits hang from cave ceilings while others rise from the floor.

- (a) What type of topography is associated with these features?
- (b) Name the deposits that hang from cave ceilings.
- (c) Name the deposits that grow upwards from cave floors.

11. Landslides

A village is located on a steep slope. Heavy rainfall saturates the soil, and vegetation has been removed from the hillside. After several hours, soil and rock move rapidly downhill.

- (a) Identify the disaster.
- (b) Explain how heavy rainfall can contribute to it.
- (c) Suggest one measure that may reduce the risk.

12. Glacial Lake Outburst Floods

A glacial lake forms behind a natural barrier of ice or loose material. If the barrier fails, a large volume of water rushes into the valley below.

- (a) Name this hazard.
- (b) Write the full form of GLOF.
- (c) State one likely impact on people or infrastructure.

13. Dust and Sandstorms

During a period of strong winds, loose dry soil and sand are lifted into the air, reducing visibility and making travel difficult.

- (a) Identify the hazard.
- (b) Which agent of gradation is responsible?
- (c) Give one precaution people may take during such an event.

14. Landforms and Human Settlements

A community is deciding where to build homes and roads. One proposed site is a broad, relatively level plain; another is a steep, unstable slope prone to landslides.

- (a) Give one reason why plains often support dense settlements.
- (b) Identify one risk of building on the unstable slope.
- (c) What does this example show about the relationship between landforms and human life?

15. Assertion–Reason: Weathering and Erosion

Assertion (A): Weathering and erosion mean exactly the same process.

Reason (R): Weathering breaks rocks down in place, while erosion removes and transports material.

Choose the correct option:

- (A) Both A and R are true, and R explains A.
- (B) Both A and R are true, but R does not explain A.
- (C) A is true, but R is false.
- (D) A is false, but R is true.

16. Assertion–Reason: Tectonic Hazards

Assertion (A): Most earthquakes and volcanoes are randomly distributed across the Earth.

Reason (R): Many earthquakes and volcanoes occur along tectonic plate boundaries.

Choose the correct option:

- (A) Both A and R are true, and R explains A.
- (B) Both A and R are true, but R does not explain A.
- (C) A is true, but R is false.
- (D) A is false, but R is true.

17. Passage-Based Question: Beaches

A coastal village depends on its beach for fishing and tourism. The beach is continually reshaped as waves and currents move sand and pebbles. During storms, strong waves can also increase coastal erosion.

- (a) How is a beach formed?
- (b) Mention two ways the beach supports the local community.
- (c) How can beaches help protect coastal settlements?

18. Passage-Based Question: Glacial Lake Outburst Floods

A mountainous region has steep slopes and a glacier-fed lake. After rapid melting and a breach in the lake's natural barrier, a sudden flood moves down the valley. The flood damages bridges and roads and isolates nearby villages.

- (a) Which type of disaster is described?
- (b) Identify one possible trigger mentioned in the passage.
- (c) Why is hazard awareness important for communities in such regions?

ANSWER KEY

Question 1

- (a) It is a convergent plate boundary.
- (b) When two continental plates collide, the crust is compressed, folded and uplifted, forming fold mountains.
- (c) Movement of the plates builds up stress along the boundary. Its sudden release causes earthquakes.

Question 2

- (a) Plate movement and interaction at boundaries are closely linked to many earthquakes and volcanoes.
- (b) The Ring of Fire.
- (c) It helps identify hazard-prone areas and supports disaster preparedness and planning.

Question 3

- (a) Weathering.
- (b) No. Weathering breaks down rocks in place; it does not require the material to be transported.
- (c) Erosion involves the removal and transport of weathered material by agents such as water, wind, waves or glaciers.

Question 4

- (a) A waterfall.
- (b) A plunge pool.
- (c) Waterfalls may attract tourists and can sometimes be used for hydroelectric power generation.

Question 5

- (a) A meander.
- (b) Lateral erosion and deposition.
- (c) An oxbow lake.

Question 6

- (a) A delta.
- (b) As the river enters a larger water body, its speed decreases and it deposits the sediments it carries.
- (c) Benefit: fertile land can support agriculture. Risk: the low-lying area may be vulnerable to floods.

Question 7

- (a) A sea arch.
- (b) A sea stack.
- (c) Waves are the main agent responsible for forming these coastal landforms.

Question 8

- (a) A U-shaped valley.
- (b) A hanging valley.
- (c) A glacier.

Question 9

- (a) Wind erosion. The removal of loose particles by wind may also involve deflation.
- (b) Ventifacts.
- (c) Yardangs.

Question 10

- (a) Karst topography.
- (b) Stalactites.
- (c) Stalagmites.

Question 11

- (a) A landslide.
- (b) Water can saturate and weaken slope material, making it more likely to move downhill, especially on steep slopes.
- (c) Protect vegetation, avoid unsafe construction on unstable slopes, improve drainage, or follow hazard warnings.

Question 12

- (a) A glacial lake outburst flood.
- (b) Glacial Lake Outburst Flood.
- (c) It can cause sudden flooding and damage roads, bridges, buildings and hydropower projects, disrupting access to nearby villages.

Question 13

- (a) A dust storm or sandstorm.
- (b) Wind.
- (c) Stay indoors where possible, close doors and windows, and avoid travel until conditions improve.

Question 14

- (a) Plains generally provide relatively level land suitable for farming, transport, construction and settlement.
- (b) Buildings and roads may be damaged or destroyed by landslides.
- (c) Landforms influence settlement patterns, livelihoods, transport, resource use and exposure to natural hazards.

Question 15

Correct option: (D) A is false, but R is true.

Explanation: Weathering breaks down rocks in place; erosion involves the removal and transport of material.

Question 16

Correct option: (D) A is false, but R is true.

Explanation: Many earthquakes and volcanoes are concentrated along plate boundaries, although not every event occurs at a boundary.

Question 17

(a) A beach forms when waves deposit sediments such as sand, pebbles or rocks along the shoreline.

(b) It can support fishing-related livelihoods and tourism-based income.

(c) Beaches can absorb some wave energy and help reduce coastal erosion, providing a degree of protection to nearby settlements.

Question 18

(a) A glacial lake outburst flood (GLOF).

(b) Rapid melting and/or failure of the lake's natural barrier.

(c) Hazard awareness helps communities understand risks, prepare evacuation plans, respond to warnings, and reduce loss of life and damage.