

Class 9 Social Science – Chapter 2

NCERT Textbook Solutions – Shaping of the Earth's Surface

Book: *Understanding Society: India and Beyond*

Class: 9 | **Session:** 2026–27

These solutions are based on the **official Chapter 2 textbook PDF you provided**, including the end-of-chapter “**Questions and Activities**”. The chapter explains plate tectonics, internal and external forces, weathering, erosion, agents of gradation, landforms and landform-associated disasters.

Chapter 2 – Questions and Activities

Q1. What are the sources of energy that are required to cause movements associated with the internal forces of the Earth?

 **Answer:**

The main source of energy for the Earth's internal forces is **heat from the Earth's interior**.

 Heat from the Earth's core causes hot material in the mantle to rise while cooler material sinks. This movement creates **convection currents** in the mantle.

These convection currents push and pull the tectonic plates, causing them to move. Plate movements are responsible for phenomena such as:

-  Formation of mountains
-  Volcanic activity
-  Earthquakes
-  Formation of ocean basins

The textbook explains that heat from the Earth's core drives convection currents that cause tectonic plate movement.

Q2. Relate various physiographic divisions you have studied in the earlier grades with various endogenic forces responsible for their origin.

✓ Answer:

Endogenic forces are forces that originate **inside the Earth**. They include processes such as **plate movement, folding, faulting, earthquakes and volcanic activity**.

Some important relationships are:

Physiographic feature	Endogenic process
 Himalayas	Collision of continental tectonic plates and folding
 Fold mountains	Compression and folding caused by plate collision
 Volcanic features	Volcanic activity associated with plate movement
 Ocean basins	Movement and interaction of tectonic plates
 Faulted landforms	Faulting caused by movements within the Earth's crust

For example, the Himalayas formed when continental plates converged and collided. The textbook specifically gives the Himalayas as an example of mountains formed at a **convergent plate boundary**.

Q3. Why and where do earthquakes occur frequently? Is it possible to predict earthquakes?

✓ Answer:

Earthquakes occur when there is a sudden release of energy associated with movements in the Earth's crust. They occur frequently near **tectonic plate boundaries**, where plates interact with one another.

The three major types of plate boundaries are:

- **Convergent boundaries** – plates move towards each other.
- **Divergent boundaries** – plates move away from each other.
- **Transform boundaries** – plates slide past one another.

Many earthquakes occur along these boundaries. The textbook also explains that the **Ring of Fire around the Pacific Ocean** has a high concentration of earthquakes and volcanoes.

Can earthquakes be predicted?

Earthquakes **cannot currently be predicted precisely in advance** in terms of their exact time, location and magnitude. However, scientists can identify earthquake-prone regions and assess risk using geological and seismic information.

Therefore, preparedness, earthquake-resistant construction and disaster-management measures are important.

Q4. “Plate movements are responsible for the distribution of earthquakes and volcanoes.” Explain.

✓ Answer:

Tectonic plates are large slabs of solid rock that move slowly over the semi-molten asthenosphere. Their movement creates stress and geological activity at plate boundaries.

At different boundaries:

● **Convergent boundaries:**

Plates move towards each other. This can cause earthquakes and volcanic activity, particularly where an oceanic plate sinks beneath a continental plate.

● **Divergent boundaries:**

Plates move apart. Magma rises and forms new crust, producing volcanic activity.

● **Transform boundaries:**

Plates slide past each other. This movement mainly causes earthquakes.

Thus, the distribution of many earthquakes and volcanoes is closely related to the location and movement of tectonic plates.

Q5. Draw and label a diagram of a meander and a delta.

✓ **Answer:**

 Meander

A **meander** is a winding curve or bend in the middle or lower course of a river. It develops through erosion on the outer bank and deposition on the inner bank.

Labels to include:

- River
- Outer/steep bank
- Inner bank
- Deposition
- Erosion

 Delta

A **delta** forms at the mouth of a river when the river deposits sediments as it enters a sea, ocean or lake.

Labels to include:

- River
- Distributaries
- Islands/Bars
- Sea

The textbook's Figure 2.12 uses these labels for the delta.

Q6. How are deforestation and erosion associated with each other? Explain.

✓ **Answer:**

🌳 **Deforestation** means the removal of trees and other vegetation.

Vegetation helps protect soil because plant roots hold the soil together and reduce the speed of surface runoff. When forests are removed:

1. 🌳 Vegetation cover decreases.
2. 💧 Rainwater flows more rapidly over the exposed soil.
3. 🌱 Soil becomes loose and vulnerable to being washed away.
4. 🌬️ Wind can also carry away exposed soil.
5. 🌾 Fertile topsoil may be lost.
6. 📉 Agricultural productivity can decline.

Therefore, **deforestation increases the risk of soil erosion**, particularly when combined with heavy rainfall, poor land management or strong winds.

The textbook notes that erosion can remove fertile topsoil and affect farming and other human activities.

Q7. Develop a plan to protect the land in your local area from erosion.

✓ **Answer:**

A local soil-erosion protection plan could include the following measures:

🌳 **1. Plant trees and vegetation**

Increase vegetation cover, especially on exposed slopes.

🌱 **2. Protect existing vegetation**

Avoid unnecessary cutting of trees and plants.

3. Construct check dams

Small check dams can slow down flowing water and reduce soil loss.

4. Use terracing on slopes

Terraces reduce the speed of surface runoff and help retain soil.

5. Use contouring and bunding

These techniques slow water flow, reduce erosion and improve water infiltration.

6. Improve drainage

Proper drainage can prevent excessive runoff and water accumulation.

7. Promote soil-conservation farming

Farmers should use practices that protect topsoil.

These measures are consistent with the conservation practices discussed in the textbook, including **contouring, bunding, terracing and check dams**.

Q8. Which disasters do you think you might experience in your region? Discuss a mitigation plan in your classroom.

Answer:

The disasters experienced depend on the geographical conditions of a region. Possible hazards include:

-  Floods
-  Landslides
-  Earthquakes
-  Dust storms
-  Avalanches
-  Glacial Lake Outburst Floods (GLOFs)

Example mitigation plan:

Before a disaster:

- Prepare an emergency kit.
- Identify safe places and evacuation routes.

- Follow official warnings.
- Avoid unsafe construction.

During a disaster:

- Remain calm.
- Move to a safer location.
- Follow instructions from authorities.
- Avoid damaged buildings and hazardous areas.

After a disaster:

- Check for injuries.
- Avoid unstable structures.
- Help vulnerable people where safe.
- Follow official instructions before returning home.

The textbook highlights landslides, avalanches, GLOFs and dust storms as disasters associated with particular landforms and environments.

Q9. Prepare a model of landforms created by underground water.

Answer:

A model can demonstrate **Karst topography**, which develops particularly in limestone and other soluble rocks through chemical weathering and erosion.

Landforms to show:

-  Cave
-  Underground river
-  Sinkhole
-  Stalactite
-  Stalagmite

Suggested model:

Use cardboard or clay to create a cross-section of limestone rock. Make a hollow cave inside it and show:

Water entering → dissolving limestone → cave formation → underground stream

Hang small clay formations from the cave roof to represent **stalactites** and place upward-growing formations on the floor to represent **stalagmites**.

The textbook identifies caves, stalactites, stalagmites, sinkholes and underground rivers as important underground-water landforms.

Q10. What precautionary measures will you take if you are staying in an earthquake-prone region?

 **Answer:**

If I live in an earthquake-prone area, I would take the following precautions:

-  **1. Stay in earthquake-resistant buildings** wherever possible.
-  **2. Secure heavy furniture** such as cupboards and shelves.
-  **3. Identify safe places** inside the building.
-  **4. Keep an emergency kit** containing essential supplies.
-  **5. Keep emergency contact numbers** available.
-  **6. Know how to switch off electricity and gas safely.**
-  **7. Learn evacuation routes** and identify open spaces.
-  **8. During an earthquake, protect the head and body and move away from windows and objects that may fall.**
-  **9. Do not use lifts during an earthquake.**
-  **10. Follow instructions from disaster-management authorities.**

The chapter emphasises that understanding earthquake-prone regions is important for disaster management.

Q11. Prepare a map showing landform-associated disasters that happened in the current calendar year.

✓ Answer / Activity:

This is a **map-based current-year activity**. It should be completed using recent newspapers, atlases and reliable reports.

Create an outline map of India and mark locations of relevant landform-associated disasters reported during **2026**, such as:

- 🏔️ Landslides
- 🌨️ Avalanches
- 💧 Glacial Lake Outburst Floods
- 🌪️ Major dust storms

For each location, add:

📍 **Place** → **Disaster** → **Date** → **Major impact**

The textbook specifically asks students to use newspapers, atlases and books to prepare a list of disaster-prone areas and mitigation measures.

For your website: I would keep this answer as an **activity template rather than inserting fixed 2026 events**, because the textbook deliberately asks students to research the current calendar year.

Q12. Create a poster showing landforms that are considered to be sacred or important in your region, and add the folk stories associated with them.

✓ Answer / Activity:

This activity should be based on the student's own region.

 **Suggested poster format:**

LANDFORMS OF OUR REGION – NATURE, CULTURE & TRADITION

Include:

-  **Name of the landform**
-  **Location**
-  **Type of landform**
-  **Why it is considered sacred or important**
-  **Local folk story or legend**
-  **How it should be protected**

Example:

A student may choose a **mountain, river, lake, cave or hill** that has cultural or religious importance in their region.

The textbook highlights that landforms have influenced human settlements, cultures, trade and historical development.

Q13. Document a case of a disaster that hit your region in the past, highlighting its effects on various human activities.

 **Answer / Activity:**

Choose a disaster that occurred in your region and prepare a short report.

 **Suggested format:**

Name of disaster: _____

Location: _____

Date/Year: _____

Type of disaster: _____

Causes:

-  Heavy rainfall
-  Earthquake
-  Unstable slopes
-  Flooding
-  Deforestation
-  Human activities

Effects:

 **People:** Loss of life, injuries or displacement.

 **Settlements:** Damage to houses and buildings.

 **Transport:** Damage to roads and bridges.

 **Agriculture:** Damage to crops and farmland.

 **Infrastructure:** Damage to electricity, communication or other facilities.

 **Economy:** Loss of livelihoods and economic activity.

Mitigation:

Explain what could be done to reduce the impact of a similar disaster in the future.

The textbook uses the **2021 Chamoli disaster in Uttarakhand** as an example of a disaster causing loss of life and damage to buildings, roads, bridges, hydel projects and connectivity.

Q14. Translate the given poster on landslide into your native language and display it in your home.

Answer / Activity:

This is a **translation activity** based on the landslide poster printed in the textbook.

For the website solution, students should:

1.  Read the landslide poster in the textbook.
2.  Translate its instructions into their regional/native language.

3.  Reproduce the translated poster neatly.
4.  Display it at home.

The chapter explains that landslides can be triggered by factors including heavy rainfall, earthquakes, volcanic activity, steep slopes, loose rocks, deforestation, mining, road construction and unplanned construction.

Important: The parsed textbook text available here does not contain the actual wording of the poster, so I would **not invent a “textbook poster translation”** for the website.

Q15. Divide the class into three groups. Each group will work on one project — water, wind, and glacier.

✅ Answer / Project Guide:

Divide the class into:

Group 1 – Water

Study:

Causes/processes:

-  Rainfall
-  Running water
-  River erosion and deposition

Landforms:

- V-shaped valleys
- Waterfalls
- Meanders
- Oxbow lakes
- Floodplains
- Deltas

Impact on humans:

-  Agriculture
-  Settlements

 Transportation
 Water resources

Mitigation:

 Soil conservation
 Check dams
 Vegetation protection
 Proper land-use planning

The textbook explains that running water creates landforms through erosion, transportation and deposition.

Group 2 – Wind

Study:

Causes/processes:

 Strong winds
 Loose and dry soil
 Sparse vegetation

Landforms:

- Yardangs
- Ventifacts
- Deflation hollows
- Desert pavements
- Sand dunes

Impact on humans:

 Agriculture
 Settlement patterns
 Tourism
 Desertification

Mitigation:

 Vegetation protection
 Stabilisation of dunes
 Prevention of overgrazing
 Appropriate land management

The textbook explains that wind erosion can create features such as yardangs, ventifacts and deflation hollows, while dunes may act as natural barriers against desertification and wind erosion.

Group 3 – Glacier

Study:

Causes/processes:

 Moving glaciers erode and transport material.

Landforms:

- U-shaped valleys
- Cirques
- Aretes
- Hanging valleys
- Fjords
- Moraines

Impact on humans:

-  Freshwater supply
-  Agriculture
-  Tourism
-  Fishing
-  Water-related resources

Mitigation / risk management:

-  Monitor glacial lakes and slopes
-  Identify vulnerable areas
-  Develop early-warning systems
-  Avoid unsafe development in high-risk areas

The textbook explains that glaciers carve landforms and also provide important freshwater resources, while moraines may form natural dams and lakes.

Quick Revision – Chapter 2

Internal Forces

- Plate movement
- Earthquakes
- Volcanic activity
- Folding

- Faulting



External Processes

- Weathering
- Erosion
- Deposition



Major Agents of Gradation

-  Running water
-  Waves and currents
-  Glaciers
-  Wind
-  Underground water



Important Landforms

- Mountains
- Valleys
- Plains
- Plateaus
- Waterfalls
- Meanders
- Deltas
- Beaches
- Sea cliffs
- Caves
- U-shaped valleys
- Moraines
- Dunes
- Sinkholes



Landform-Associated Disasters

-  Landslides
-  Avalanches
-  GLOFs
-  Dust storms

These are the major concepts summarised by the textbook before the end-of-chapter questions.

Important Terms

Term	Meaning
 Tectonic Plate	A large slab of solid rock forming part of the Earth's lithosphere
 Convection Currents	Movement of mantle material caused by heat differences
 Endogenic Forces	Forces originating inside the Earth
 Weathering	Breaking down of rocks without movement of the material
 Erosion	Wearing away and transportation of soil and rock
 Deposition	Accumulation of transported material
 Meander	A winding bend in a river
 Delta	Depositional landform formed at a river's mouth
 Moraine	Material deposited by a glacier
 Karst Topography	Landforms produced by groundwater acting on soluble rocks
 Landslide	Sudden movement of soil, rock or debris down a slope
 GLOF	Glacial Lake Outburst Flood