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Shaping of the Earth's Surface

The Big Questions (Page no. 13)**1. What shapes the Earth's surface?**

Ans. The Earth's surface is shaped by two main forces:

- **Internal forces** → act from inside the Earth (like earthquakes, volcanoes, plate movements)
- **External forces** → act on the surface (like weathering, erosion, and deposition)

Together, these forces continuously change and form landforms like mountains, plains, and valleys.

2. What is plate tectonics? What are the effects of plate movement?

Ans. Plate tectonics is the theory that the Earth's outer layer (lithosphere) is divided into large pieces called tectonic plates, which move slowly over the semi-molten mantle due to internal heat and convection currents.

The movement of tectonic plates leads to several important changes on the Earth's surface:

- **Formation of Mountains** – When plates collide, rocks fold and form mountains.
- **Earthquakes** – Sudden movement of plates causes shaking of the Earth's surface.
- **Volcanic Eruptions** – Magma rises through cracks when plates move.
- **Formation of Oceans and Valleys** – Plates moving apart or sliding create new landforms.
- **Changes in Landforms** – Continuous movement reshapes the Earth's surface over time.

3. How are landforms formed and how are they classified?

Ans. Landforms are formed by natural processes such as:

- **Weathering** → breaking down of rocks
- **Erosion** → carrying away of soil and rocks
- **Deposition** → settling of materials
- **Plate movement** → movement of tectonic plates

Landforms are mainly classified into:

- **Mountains:** High-elevation landmasses with steep gradients and narrow peaks, usually formed by tectonic collision or volcanic activity (e.g., the Himalayas).
- **Plateaus:** Elevated flat-topped tablelands that rise sharply above the surrounding area, often rich in minerals (e.g., the Deccan Plateau).
- **Valleys:** Low-lying depressions or elongated troughs running between hills or mountains, typically carved out by rivers (V-shaped valleys) or glaciers (U-shaped valleys).
- **Plains:** Low-lying, relatively flat stretches of land, typically created by river sediment deposition (e.g., the Indo-Gangetic Plain).

4. How are humans and other living beings connected to these landforms?

Ans. Humans and other living beings are closely connected to landforms because landforms directly influence their life, activities, and survival.

- **Habitat:** Different landforms provide homes for plants, animals, and humans (e.g., forests in mountains, crops in plains).
- **Resources:** Landforms provide natural resources like water, minerals, soil, and forests.
- **Agriculture:** Fertile plains support farming, while mountains and deserts are less suitable.
- **Climate Influence:** Landforms affect climate, which in turn affects living conditions.
- **Human Activities:** Settlement, transport, and occupations depend on the type of landform.
- **Biodiversity:** Different landforms support different types of plants and animals.

5. How do disasters associated with different landforms impact human lives?

Ans. Disasters linked to landforms have serious effects on people and the environment:

- **Loss of life and injuries** → Landslides, avalanches, and floods can be deadly
- **Damage to property** → Houses, roads, and infrastructure get destroyed
- **Economic losses** → Farming, tourism, and businesses are affected
- **Displacement of people** → People may lose homes and be forced to relocate
- **Environmental damage** → Soil erosion, loss of vegetation, and habitat destruction

LET'S MAP

Pick any two plates from the map above and complete the table given below.

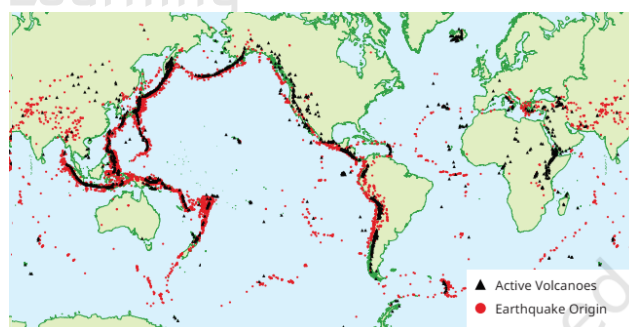
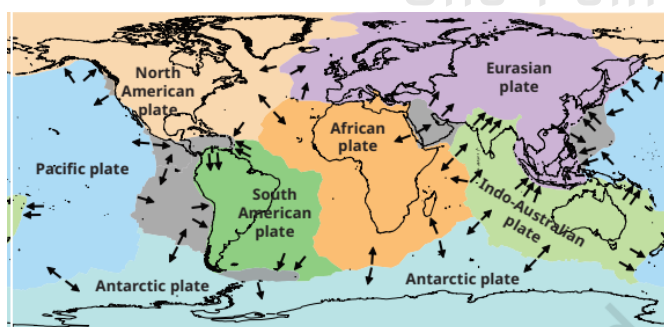
Name of the plate	Continents	Ocean

Ans.

Name of the Plate	Continents	Oceans
• African Plate	- Africa	- Atlantic Ocean, Indian Ocean
• Eurasian Plate	- Europe, Asia	- Atlantic Ocean, Arctic Ocean
• North American Plate	- North America	- Atlantic Ocean, Arctic Ocean
• South American Plate	- South America	- Atlantic Ocean
• Indo-Australian Plate	- Australia, Southern Asia	- Indian Ocean, Pacific Ocean
• Antarctic Plate	- Antarctica	- Southern Ocean
• Pacific Plate	- None (Purely Oceanic)	- Pacific Ocean

LET'S EXPLORE

Examine the plate map (Fig. 2.3) with the earthquake and volcano map (Fig. 2.4). What correlation do you observe?



Ans. There is a clear relationship between the two maps. Most earthquakes and volcanoes are found along the edges of tectonic plates. This shows that plate boundaries are zones of high geological activity, while the interiors of plates have very few such events.

LET'S EXPLORE

Observe the map showing the distribution of earthquakes and volcanoes (Fig. 2.4). Can you identify which continents and countries are located around the Ring of Fire with the help of an atlas or a globe?

Ans. The map shows that the Ring of Fire is located around the Pacific Ocean, where many earthquakes and volcanoes occur.

Continents around the Ring of Fire:

- Asia
- North America
- South America
- Australia (Oceania)

Countries around the Ring of Fire:

- Japan, Indonesia, Philippines
- United States, Mexico
- Chile, Peru
- New Zealand, Papua New Guinea

These areas lie along active plate boundaries, which is why they experience frequent earthquakes and volcanic eruptions.

LET'S EXPLORE**Does India have a risk of earthquakes?**

India has experienced some major earthquakes in the past, resulting in thousands of deaths. A large earthquake in a densely populated country like India can cause severe damage to life and environment.

Ans. Yes, India has a risk of earthquakes.

- **Can you find out which region is more vulnerable to earthquakes?**

Ans. Most Vulnerable Regions in India:

- Himalayan region (Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Northeast states)
- Indo-Gangetic plains
- Some parts of Gujarat and Maharashtra

These areas are more vulnerable because they lie near active plate boundaries, especially where the Indian Plate collides with the Eurasian Plate.

- **Why do you think human lives are at risk?**

Ans.

- **High population density** → many people live in affected areas
- **Weak buildings** → poorly constructed houses collapse easily
- **Lack of preparedness** → people may not know safety measures
- **Urban congestion** → crowded cities make rescue difficult
- **Secondary hazards** → landslides, fires, and infrastructure damage

LET'S EXPLORE

Look carefully at this photograph and answer the following questions:

- **What do you think caused this situation?**

Ans. This situation was caused by a volcanic eruption, which spread ash and dust over the area.

- **What could that grey powder be?**

Ans. The grey powder is volcanic ash, made of fine particles of rock, minerals, and dust released during the eruption.

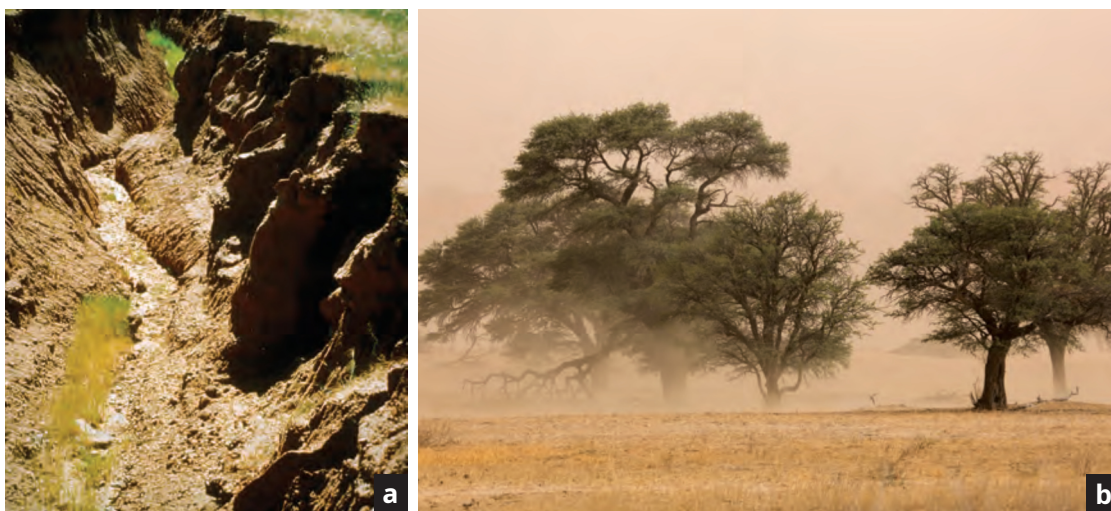
- **What does it tell us about the Earth's internal forces?**

Ans. It shows that powerful internal forces inside the Earth can cause sudden events like volcanic eruptions, which can change landforms and affect human life.



LET'S EXPLORE

Observe the photographs (Fig. 2.9) and also note the types of erosion. How are farmers affected by erosion due to water and wind?



Ans. Farmers are greatly affected by erosion caused by both water and wind.

- Erosion by water: Erosion by water removes the fertile topsoil, which is essential for crop growth. It also forms gullies and channels, making the land uneven and difficult to cultivate. This leads to a decrease in soil fertility and crop production.
- Erosion by wind: Erosion by wind blows away the fine, nutrient-rich soil, leaving the land dry and less productive. It can also cover crops with sand and dust, damaging them and reducing yields.

LET'S EXPLORE

Have you heard about the Sundarbans delta? Try and explore its uniqueness and find out why it is popular with tourists.

Ans. Yes, the Sundarbans Delta is a famous and important delta in South Asia.

The Sundarbans Delta is unique because:

- It is the largest delta in the world
- Formed by the rivers Ganga River, Brahmaputra River, and Meghna River
- Covered with dense mangrove forests (salt-tolerant trees)
- Has a network of rivers, creeks, and islands
- Rich in biodiversity, including the Royal Bengal Tiger

The Sundarbans Delta is popular with tourists because:

- It has rich wildlife, including the Royal Bengal Tiger, crocodiles, and many birds
- It offers a unique mangrove forest ecosystem not found in many places
- The area has beautiful rivers, creeks, and islands
- Tourists enjoy boat safaris and nature exploration
- These features make it a unique and exciting tourist destination.

LET'S EXPLORE

Observe the landforms around your school or residence and try to identify which agent may have created them.

Ans. The landforms around my school/residence are mainly shaped by running water and wind.

- Running water (rain and small streams) has created small channels and uneven surfaces by washing away soil.
- Wind has carried away fine soil particles, making the land dry and slightly dusty in some areas.
- In some places, human activities like construction have also changed the natural landforms.

LET'S EXPLORE

Complete the exercises given at the end of each type of disaster with the help of newspapers, atlases, and books. Make a list of disaster-prone areas from India and the world and enlist mitigation measures quoting recent examples.

Ans. Disaster-Prone Areas & Mitigation Measures (with Recent Examples):

1. Earthquake-Prone Areas

- **India:** Himalayan region (Jammu & Kashmir, Himachal Pradesh, Uttarakhand), Northeast India (Assam, Manipur, Meghalaya), Parts of Gujarat (Bhuj region)
- **World:** Japan, Indonesia, Turkey, California (USA)
- **Recent Example:** 2023 Turkey–Syria Earthquake – massive destruction and loss of lives
- **Mitigation Measures:**
 - i. Earthquake-resistant buildings
 - ii. Strict building codes
 - iii. Disaster preparedness drills
 - iv. Early warning systems
 - v. Public awareness programs

2. Flood-Prone Areas

- **India:** Bihar (Ganga basin), Assam (Brahmaputra valley), Uttar Pradesh, Kerala,
- **World:** Bangladesh, Pakistan, China (Yangtze River region)
- **Recent Example:** 2022 Pakistan Floods – affected millions due to heavy monsoon rains
- **Mitigation Measures:**
 - i. Construction of dams and embankments
 - ii. Improved drainage systems
 - iii. Flood forecasting and warning systems
 - iv. Afforestation
 - v. Planned urban development

3. Cyclone-Prone Areas

- **India:** Odisha coast, Andhra Pradesh, West Bengal, Tamil Nadu
- **World:** Philippines, USA (Gulf Coast), Japan
- **Recent Example:** Cyclone Amphan (2020) and frequent Bay of Bengal cyclones
- **Mitigation Measures:**
 - i. Construction of cyclone shelters
 - ii. Early warning systems
 - iii. Coastal afforestation (mangroves)
 - iv. Proper evacuation planning
 - v. Strengthening coastal infrastructure

4. Volcanic Regions

- **India:** Andaman & Nicobar Islands (Barren Island – active volcano)
- **World:** Indonesia, Japan, Iceland, Italy
- **Recent Example:** Iceland volcanic eruptions (2023–24)
- **Mitigation Measures:**
 - i. Monitoring volcanic activity
 - ii. Prepared evacuation plans
 - iii. Hazard mapping of risk zones
 - iv. Restricting settlements near volcanoes
 - v. Public awareness and emergency preparedness

5. Drought-Prone Areas

- **India:** Rajasthan, Maharashtra (Vidarbha), Karnataka
- **World:** Sub-Saharan Africa, Australia, Parts of USA
- **Recent Example:** Horn of Africa drought (2020–2023)
- **Mitigation Measures:**
 - i. Rainwater harvesting
 - ii. Efficient irrigation methods (drip irrigation)
 - iii. Water conservation practices
 - iv. Use of drought-resistant crops
 - v. Proper water storage and management systems

Landslides

Prone areas:

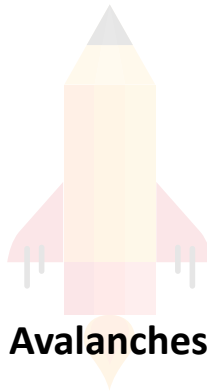
- Himalayan regions (Himachal Pradesh, Uttarakhand, Jammu & Kashmir)
- Northeast India
- Western Ghats (Kerala, Karnataka)
- Nilgiri Hills (Tamil Nadu)

Mitigation measures:

- Afforestation and planting vegetation
- Proper drainage systems
- Avoid construction on steep slopes
- Controlled land use and planning
- Building retaining walls to support slopes

Recent examples:

- 2023 Himachal Pradesh landslides
- 2018 Kerala landslides during floods



Avalanches

Prone areas:

- Himalayan region (Jammu & Kashmir, Himachal Pradesh, Uttarakhand)
- Snow-covered mountain regions worldwide (Alps, Rockies)

Mitigation measures:

- Snow fences and barriers
- Controlled triggering of avalanches
- Monitoring snow conditions
- Restricting human activity in risk zones
- Early warning systems

Recent examples:

- 2023 Siachen Glacier avalanche (India)
- Frequent avalanches in the Alps

GLOFs

Prone areas:

- Himalayan region (Sikkim, Uttarakhand, Himachal Pradesh, Jammu & Kashmir)
- Glaciated regions of Nepal and Bhutan
- High-altitude areas with glacial lakes

Mitigation measures:

- Regular monitoring of glacial lakes using satellites and surveys
- Controlled drainage of excess water from glacial lakes
- Strengthening and stabilizing moraine dams
- Early warning systems for downstream communities

- Restricting human activities near vulnerable glacial lakes
- Disaster preparedness and evacuation planning

Recent examples:

- Sikkim GLOF (2023) due to a glacial lake burst causing floods in Teesta River
- Uttarakhand floods (Chamoli, 2021) linked to glacier-related events
- Nepal GLOF incidents affecting downstream settlements

Dust Storms

Prone areas:

- Desert regions (Rajasthan – Thar Desert)
- Semi-arid regions of Gujarat, Haryana, and Punjab
- Parts of the Middle East and North Africa
- Areas with dry climate and sparse vegetation

Mitigation measures:

- Planting trees and shelter belts to reduce wind speed
- Controlling deforestation and overgrazing
- Adopting proper farming practices (like crop rotation and soil cover)
- Stabilizing sand dunes with vegetation
- Early warning systems and public awareness
- Using protective measures (masks, staying indoors during storms)

Recent examples:

- Dust storms in North India (Delhi, Rajasthan) during summer months
- Severe dust storms in the Middle East affecting visibility
- Dust storms in parts of Africa due to prolonged drought

Questions and activities

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

Ans. The movements inside the Earth are caused by energy from:

- Heat energy from the Earth's interior (due to radioactive decay and residual heat)
- Pressure inside the Earth
- Gravitational forces

These energies cause internal processes like earthquakes, volcanoes, folding, and faulting.

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

Ans. Different landforms are created by internal (endogenic) forces:

Physiographic Division	Endogenic Force	How it is Formed	Example
• Mountains	- Folding (Compression)	- Rocks are folded due to plate collision	- Himalayas
• Plateaus	- Volcanic activity / Uplift	- Lava spreads or land is uplifted	- Deccan Plateau
• Plains	- Uplift (base formation)	- Land is uplifted, later leveled by deposition	- Northern Plains
• Rift Valleys / Block Mountains	- Faulting (Tension)	- Land breaks; some parts rise, others sink	- Rift Valley

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

Ans. Earthquakes occur due to the sudden movement of tectonic plates inside the Earth. When stress builds up along faults or plate boundaries, it is released suddenly in the form of energy, causing the ground to shake.

Earthquakes occur most frequently in the following areas:

- Along tectonic plate boundaries where plates collide, separate, or slide past each other
- The Himalayan region (due to collision of the Indian and Eurasian plates)
- The Pacific Ring of Fire, which is the most earthquake-prone zone in the world
- Near fault lines (cracks in the Earth's crust)
- Volcanic regions where magma movement causes disturbances

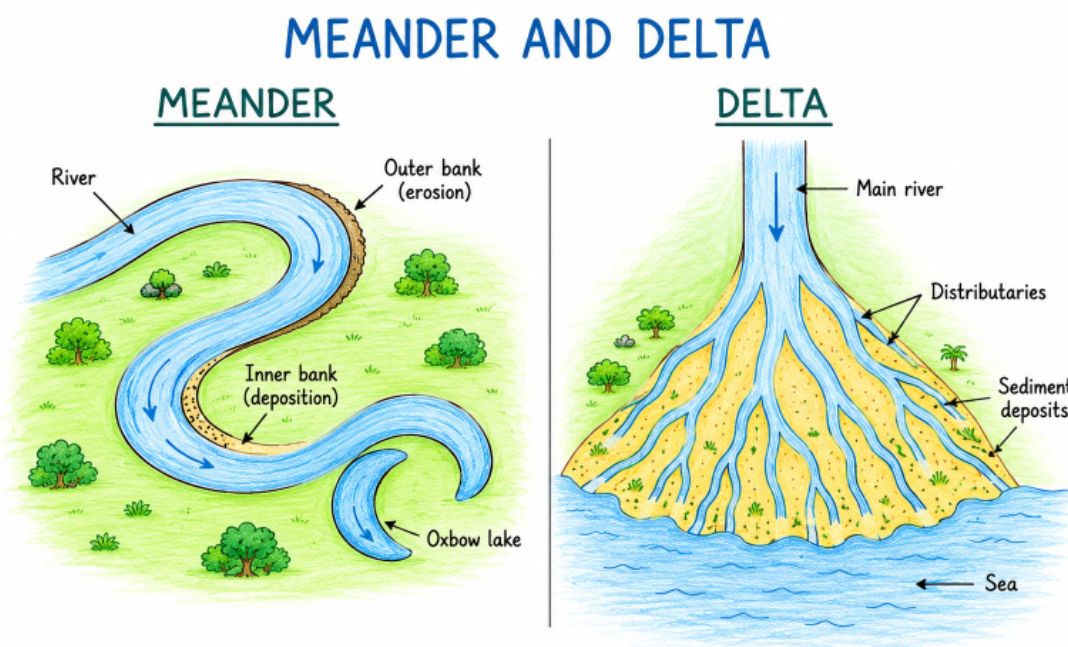
4. "Plate movements are responsible for the distribution of earthquakes and volcanoes." Explain.

Ans. Plate movements play a key role in the distribution of earthquakes and volcanoes because of

- The Earth's crust is divided into large tectonic plates that are constantly moving.
- Most earthquakes occur at plate boundaries where plates collide, separate, or slide past each other, causing sudden release of energy.
- At convergent boundaries, one plate goes under another (subduction), leading to both earthquakes and volcanic eruptions.
- At divergent boundaries, plates move apart, allowing magma to rise and form volcanoes.
- At transform boundaries, plates slide past each other, causing frequent earthquakes but little volcanic activity.
- Earthquakes and volcanoes are not randomly distributed but are concentrated along plate margins.
- The Pacific Ring of Fire is a major example where many volcanoes and earthquakes occur due to active plate movements.

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

Ans.

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

Ans. Deforestation and erosion are closely related to each other.

- Deforestation means cutting down trees. Trees help hold the soil together with their roots.
- When trees are removed, the soil becomes loose and exposed.
- This loose soil is easily carried away by wind and water, causing soil erosion.

Ans. A proper plan to protect land from erosion in the local area should include the following measures:

- **Afforestation:** Planting trees and maintaining vegetation cover helps bind the soil with roots and reduces the impact of wind and water.
- **Control of Water Flow:** Construction of check dams, proper drainage systems, and rainwater harvesting structures helps slow down water movement and prevents soil from being washed away.
- **Contour Ploughing and Terracing:** Farming along contour lines and creating terraces on slopes reduces runoff and helps retain soil.
- **Avoiding Deforestation and Overgrazing:** Protecting existing vegetation and controlling grazing prevents the soil from becoming loose and exposed.
- **Soil Conservation Techniques:** Practices like mulching, crop rotation, and growing cover crops improve soil strength and reduce erosion.
- **Riverbank Protection:** Planting grasses and trees along riverbanks helps prevent soil from being eroded by flowing water

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

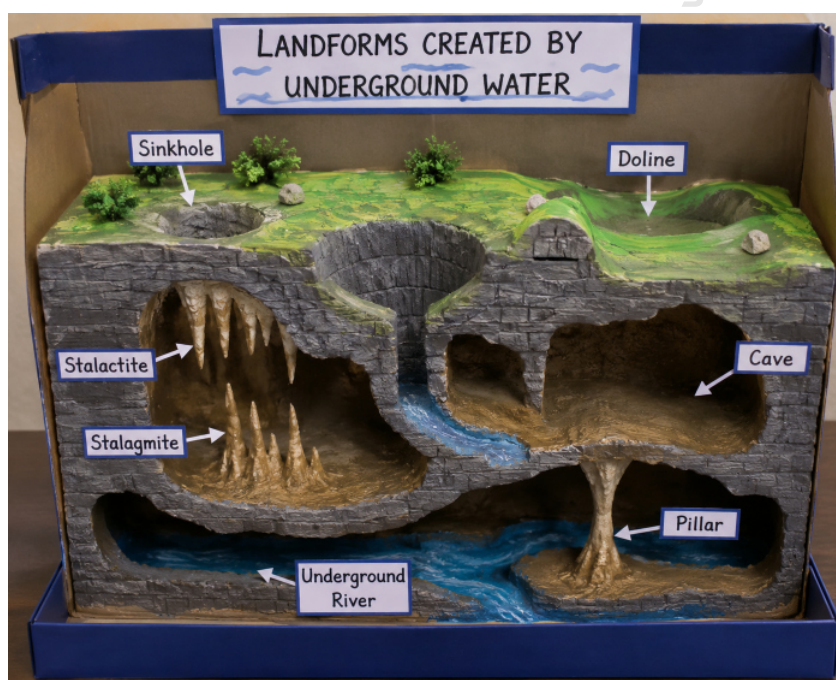
Ans. The disasters that may occur in my region include floods, droughts, earthquakes, and storms (this may vary depending on the area).

Mitigation Plan (Classroom Discussion):

- **Awareness and Education:** Students should learn about different disasters and safety measures through drills and discussions.
- **Emergency Preparedness:** Keep emergency kits ready with first aid, water, food, and important contacts.
- **Proper Land Use:** Avoid construction in flood-prone or landslide-prone areas.
- **Plantation and Environmental Protection:** Plant more trees to prevent soil erosion and reduce the impact of floods.
- **Early Warning Systems:** Follow weather forecasts and government warnings to stay alert.
- **Safe Infrastructure:** Build strong houses that can withstand earthquakes and storms.

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

Ans.



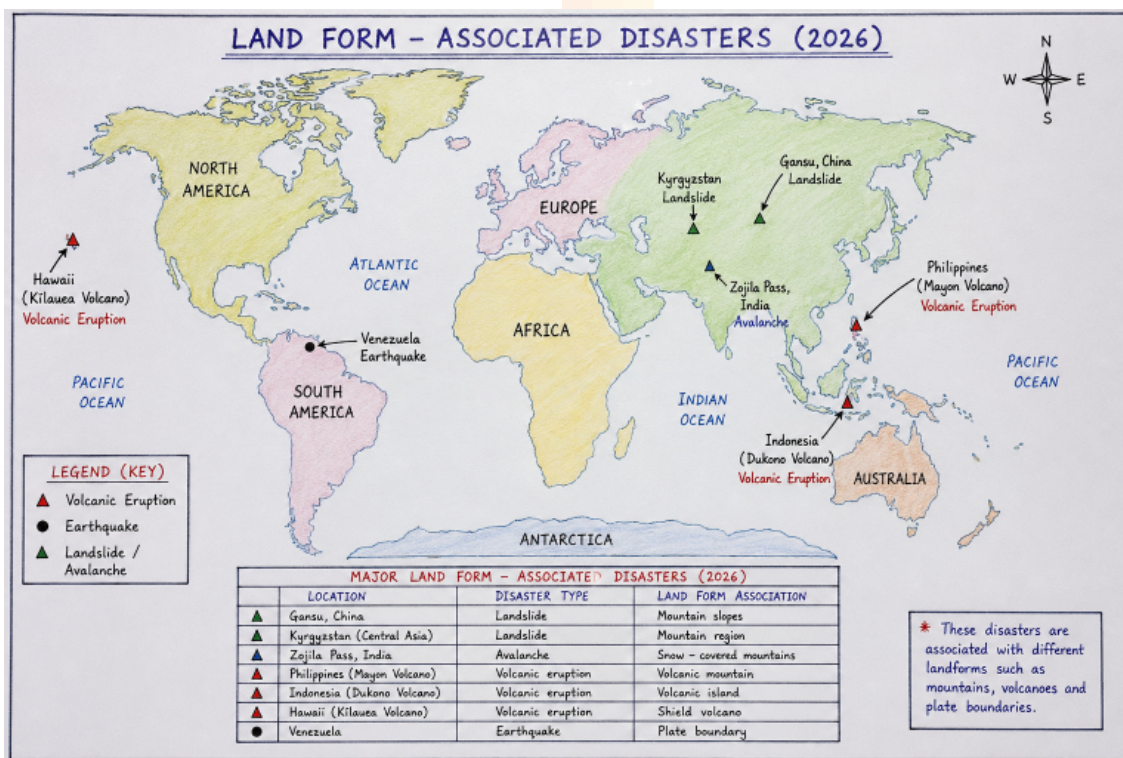
10. What precautionary measures will you take if you are staying in an earthquake-prone region?

Ans. If I am staying in an earthquake-prone region, I will take the following precautions:

- **Before an Earthquake**
 - Build houses using earthquake-resistant techniques
 - Fix heavy furniture (almirahs, shelves) firmly to walls
 - Keep an emergency kit (first aid, water, torch, food) ready
 - Identify safe places in your home (under table, strong furniture)
 - Make a family emergency plan and meeting point
- **During an Earthquake**
 - Drop, Cover, and Hold under a strong table
 - Stay away from windows, glass, and heavy objects
 - Do not use lifts (elevators)
 - If outdoors, move to an open area away from buildings and trees
 - Protect your head and neck
- **After an Earthquake**
 - Check yourself and others for injuries
 - Stay away from damaged buildings
 - Be prepared for aftershocks
 - Follow instructions from rescue authorities
 - Use phones only for emergency purposes

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

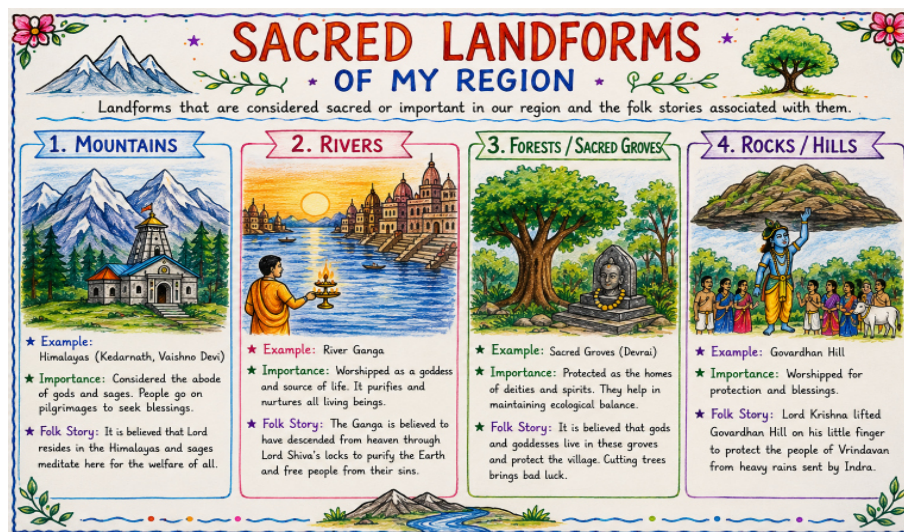
Ans. Landform-Associated Disasters Around the World – 2026

**Steps to Make the Map**

- Take a blank political world map.
- Colour the continents lightly.
- Locate the countries listed above.
- Draw the correct symbol near each place.
- Add the title and legend box on one side.

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

Ans.



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

Ans.

Case Study: Gujarat Earthquake (2001)

- **Region:** Gujarat, India
- **Type of Disaster:** Earthquake
- **Overview:** In 2001, a powerful earthquake struck Gujarat, especially the Bhuj region. It was one of the deadliest earthquakes in India, causing massive destruction and loss of life.
- **Effects on Human Activities:**
 - Agriculture:** Farmlands were damaged and irrigation systems were destroyed.
 - Transportation:** Roads, railways, and airports were severely damaged.
 - Housing:** Thousands of buildings collapsed, leaving many people homeless.
 - Livelihood:** Businesses and industries were destroyed, causing economic loss.
 - Health:** Many people were injured, and there was a shortage of medical facilities.
 - Education:** Schools and colleges were damaged or closed for long periods.



Case Study: Indian Ocean Tsunami (2004)

- **Region:** Coastal India (Tamil Nadu, Andaman & Nicobar Islands)
- **Type of Disaster:** Tsunami
- **Overview:** In 2004, a massive undersea earthquake triggered a tsunami in the Indian Ocean. Huge waves hit coastal areas of India, causing widespread destruction and heavy loss of life.
- **Effects on Human Activities:**
 - Agriculture:** Coastal farmlands were flooded with saltwater, damaging crops.
 - Transportation:** Ports, roads, and communication systems were destroyed.
 - Housing:** Coastal villages were washed away, leaving thousands homeless.
 - Livelihood:** Fishing and tourism industries were badly affected.
 - Health:** Many deaths occurred, and diseases spread due to poor sanitation.
 - Education:** Schools were destroyed or used as relief camps.



Case Study: Kerala Floods (2018)

- **Region:** Kerala, India
- **Type of Disaster:** Flood
- **Overview:** In 2018, Kerala experienced one of the worst floods in its history due to heavy monsoon rainfall and the release of water from dams. Large areas were submerged, causing widespread destruction.
- **Effects on Human Activities:**
 - Agriculture:** Crops were destroyed and farmlands were flooded, leading to huge losses for farmers.
 - Transportation:** Roads, railways, and bridges were damaged, disrupting travel and communication.
 - Housing:** Thousands of houses were damaged or destroyed, leaving people homeless.
 - Livelihood:** Shops, businesses, and daily wage work were affected, causing loss of income.
 - Health:** Waterborne diseases spread due to contaminated water and poor sanitation.
 - Education:** Schools and colleges were closed or used as relief camps.



Case Study: Cyclone Amphan (2020)

- **Region:** West Bengal & Odisha, India
- **Type of Disaster:** Cyclone
- **Overview:** In 2020, Cyclone Amphan was one of the strongest cyclones to hit eastern India. It formed over the Bay of Bengal and caused widespread destruction, especially in coastal areas of West Bengal and Odisha.
- **Effects on Human Activities:**
 - Agriculture:** Crops were destroyed due to strong winds and heavy rainfall, causing huge losses to farmers.
 - Transportation:** Roads, railways, and airports were damaged; trees blocked roads and disrupted movement.
 - Housing:** Thousands of houses were damaged or destroyed, leaving people homeless.
 - Livelihood:** Fishing, small businesses, and daily wage workers were badly affected.
 - Health:** Injuries occurred and sanitation issues increased, raising the risk of diseases.
 - Education:** Schools and colleges were closed and many were used as relief camps.



Case Study: Wayanad Landslide (2026)

- **Region:** Wayanad, Kerala, India
- **Type of Disaster:** Landslide
- **Overview:** In 2026, heavy monsoon rainfall triggered a deadly landslide in Wayanad, Kerala. The disaster caused loss of lives and severe damage to nearby areas.
- **Effects on Human Activities:**
 - Agriculture:** Farmlands were buried under mud and debris, damaging crops.
 - Transportation:** Roads were blocked due to landslide, affecting movement and rescue work.
 - Housing:** Nearby houses and worker shelters were damaged or buried.
 - Livelihood:** Workers lost jobs and income due to disruption in construction and local work.
 - Health:** Many people were injured, and medical help was delayed due to blocked routes.
 - Education:** Schools in nearby areas were closed temporarily due to unsafe conditions.



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

Ans. The translation of the landslide poster into Hindi:

भूस्खलन (Landslide)

सुरक्षित रहने के लिए तैयार रहें

पहले (Before):

- पेड़ लगाएँ जो मटिटी को मजबूती से पकड़ते हैं
- स्थानीय मौसम विभाग की चेतावनियाँ और समाचार सुनें
- नालियों को साफ रखें, ढलानों के पास कचरा न फेंकें
- कीचड़, दरारें या झुकते पेड़ों जैसे संकेतों पर ध्यान दें
- ढलान या अस्थिर जगहों के पास निर्माण से बचें

दौरान (During):

- शांत रहें, घबराएँ नहीं
- परिवार/साथियों के साथ सुरक्षित स्थान पर रहें
- यदघिर के पास दरारें या गरिते पत्थर देखें, तो तुरंत सुरक्षित स्थान पर जाएँ
- नदी/नालों से दूर रहें
- स्थानीय अधिकारियों को सूचित करें

बाद में (After):

- भूस्खलन क्षेत्र में वापस न जाएँ
- घायल या फँसे लोगों की जाँच करें
- बजिली और गैस लाइनों से दूर रहें
- गंदा या दूषित पानी न पिएँ
- अधिकारियों के निर्देशों का पालन करें

स्मार्ट बनें, तैयार रहें (Be Smart, Be Prepared)



15. Divide the class into three groups. Each group will work on one project (water, wind, and glacier). The project should highlight the causes, impact on human life and the environment, and mitigation measures.

Ans. Disaster Study (Water, Wind, Glacier)

Group 1: Water (Floods)

- **Causes:** Heavy rainfall, river overflow, poor drainage
- **Impact:** Loss of life, damage to homes, crop destruction, water pollution
- **Mitigation:** Better drainage systems, dams, early warning systems, afforestation

Group 2: Wind (Cyclones/Storms)

- **Causes:** Low-pressure systems over oceans, high wind speeds
- **Impact:** Property damage, power outages, injuries, disruption of transport
- **Mitigation:** Cyclone shelters, strong building design, timely evacuation, weather forecasting

Group 3: Glacier (Glacial Floods/Avalanches)

- **Causes:** Rising temperatures, glacier melting, ice breakage
- **Impact:** Flooding, loss of infrastructure, damage to ecosystems, water supply changes
- **Mitigation:** Monitoring glaciers, controlled water release, climate action, disaster preparedness

Each group should present causes, effects on human life & environment, and preventive measures clearly.