2. The Signature of Time

Let us Assess

1. Question

Identify the different plate margins. Which are the associated landforms?

Answer

The outermost layer of the earth is in the solid form known as the crust. The crust and the upper part of the layer (or mantle) form the lithosphere which is a very thin layer. Above the Asthenosphere is the lithospheric plate. The Asthenosphere is in the semi-plastic state. Due to the high temperature in the interior of the earth, the part of the mantle remains, i.e., Magma melts and continuous convection happens. In a year, the plates move at a speed of 2 to 12 centimetres and this movement has never been consistent. There are different types of landforms formed because of the plate movements. Landforms such as anticlines and synclines, folded mountains, fault-block Mountains, and plateaus are formed.

Plate margins are generally weak against the earthquakes, volcanoes, and faults. The result of the plate movements is the Fold Mountains, plateaus, and volcanoes. The different plate margins are:

• Divergent margin: In this type of plate margin, plates move away from each other. Due to the divergent of the plates, Magma comes out from the gap in between and turns into solid to form mountains. These mountains are also known as Mid Atlantic Mountains.

• Convergent margin: in this type of plate margin, plates come near to each other. Due to this type of plate movement Fold Mountains are formed. Fold Mountains are formed when rock layers fold due to the compressing of the lithospheric plates along convergent margins. Example - between the Indian plate and the Eurasian plate, Himalaya is formed. The Alps, the Andes, the Atlas, etc are the other examples.

• Transform margins: Also known as shear margins, the plates move to slide past to each other, because of these landforms generally doesn’t form. These margins are fault zones, for example- San Andreas Fault Zone in North America.

2 A. Question

Answer the following questions based on earthquakes.

How do earthquakes occur?

Answer

In the interior of the earth, due to the plate movements and other causes rocks experiences displacement. Due to this, earth’s lithosphere experiences rigorous pressure. This led to the generation of the seismic waves which is exactly like the waves we see when we put an object in the pond which then spreads into all the directions. Earth on the other hand experiences vibration, which we call earthquake. There are many other reasons due to which earthquake occurs –when the roof of the mines fall down, volcanic eruptions and pressure put on the reservoirs.

The point where earthquake occurs inside the earth is known as focus. The point above it in a vertical form is referred to as epicentre.

2 B. Question

Answer the following questions based on earthquakes.

Which are the different types of seismic waves?

Answer

Due to the plate movements and other causes in the interior of the earth, rocks experience displacement. Due to this, earth’s lithosphere experiences rigorous pressure. This led to the generation of the seismic waves. There are three different types of seismic waves such as – primary waves, secondary waves and surface waves. An instrument called seismograph is used to record seismic waves. To measures, the intensity of energy released at the time of an earthquake Richter scale is used.

2 C. Question

Answer the following questions based on earthquakes.

Which one of the seismic waves cause maximum destruction on the earth's surface?

Answer

Due to the plate movements and other causes in the interior of the earth, rocks experience displacement. Due to this, earth’s lithosphere experiences rigorous pressure. This led to the generation of the seismic waves. There are three different types of seismic waves such as – primary waves, secondary waves and surface waves. Surface waves are considered to be the wave that causes maximum destruction on the earth's surface.

2 D. Question

Answer the following questions based on earthquakes.

Which is the scale used to measure the intensity of earthquakes?

Answer

To measure the intensity of energy released at the time of an earthquake Richter scale is used. One of the most severe recorded earthquakes is of Chile. It has recorded an intensity of 9.5.

3. Question

What do you mean by 'the Pacific Ring of Fire?

Answer

'The Pacific Ring of Fire’ referred to the volcanoes occurred around the Pacific Ocean. 80% of the volcanoes are sited around the Pacific Ocean. This region has almost more than 452 volcanoes which are referred to as 'The Pacific Ring of Fire’.

4. Question

How are volcanoes useful to mankind?

Answer

Hot molten rock comes out from the crack of the outer layer; from this molten rock material volcanoes are formed. Even though volcanic eruptions are dangerous to mankind but they are also useful in many ways –

• From the weathering of the lava rocks, the soil is formed which is fertile in nature. For example- the black soil of the Deccan plateau.

• In volcanic regions, Geysers are formed. Geysers are the hot spring of water which comes out and also throws steam into the air along with this, example - The Old Faithful Geyser, Yellow Stone National Park and North America.

• Volcanic ash is good manure.

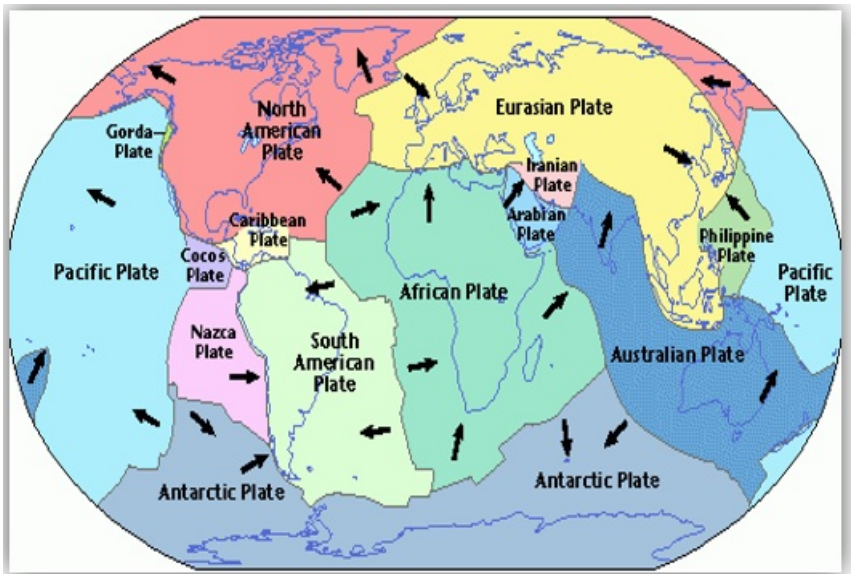
Extended Activities

1. Question

Collect from Internet the maps showing the movements of lithospheric plates and include them in the digital album.

Answer

Lithospheric plates are the regions around the earth’s crust and upper mantle (mantle remains, i.e., Magma melts and continuous convection happens) that is splintered into plates. Lithosphere the outermost shell of the earth is broken to form tectonic plates. Some of the major lithospheric plates are - African plate, Antarctic plate, Eurasian plate, Indo-Australian plate, North American plate, Pacific plate and South American plate.

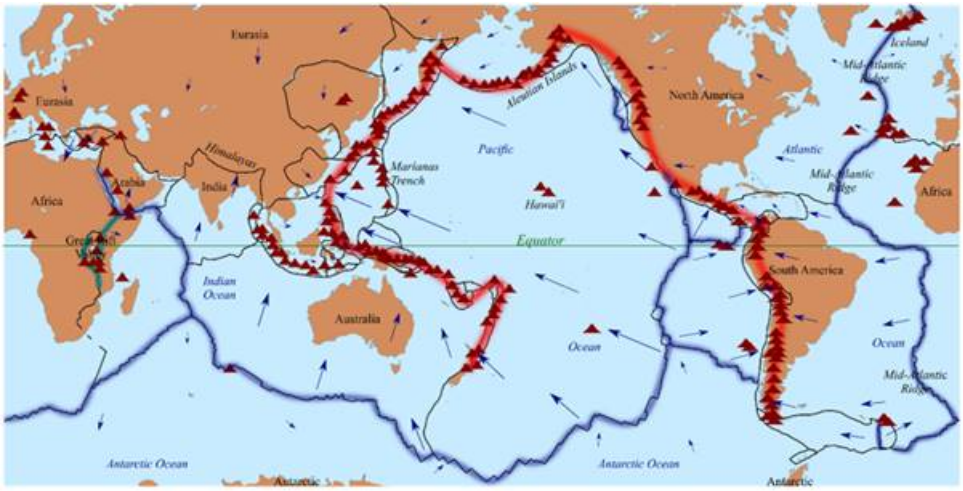


In the map below, different lithospheric plates are shown.

2. Question

Prepare a map of the 'Pacific Ring of Fire' and include it in the digital album.

Answer



3. Question

Collect information on the most destructive volcanic eruptions and earthquakes on the earth.

Answer

Some of the most destructive volcanic eruptions on earth are –

• Mount Pinatubo – Luzon, Philippines – 1991

• Mount St. Helens – Washington state, United States – 1980

• Nevado del Ruiz, Columbia, 1985

• Krakatoa – Sunda Strait, Indonesia – 1883

• Tambora – Indonesia – 1815

Some of the most destructive Earthquakes on earth are –

• 15 August 1950 – Assam-Tibet - Magnitude 8.6

• 1 November 1755 – Lisbon - Magnitude 8.7

• 13 January 1906 – coast of Ecuador - Magnitude 8.8

• 27 February 2010 – off Bio-Bio, Chile - Magnitude 8.8

- 26 January 1700 – North Pacific coast of America -Magnitude 9