

CHAPTER

3

## INTERIOR OF THE EARTH

**T**his chapter provides the learner with basic perception regarding the interior of the earth. Through the effective transaction of the chapter, the learners acquire the idea of the nature of seismic waves and the role of seismic waves in understanding the internal structure of the earth. Knowledge of various internal processes will create eagerness among the learners to acquire more information about the earth's interior. They will be keen to know why the earth is prone to natural disasters like earthquake, landslide, volcanoes, and tsunamis.

**Values/Attitude:**

**Time: 4 Periods**

**Concept/Content/Ideas**

Sources of information about the earth's interior  
 - Direct sources.  
 - Indirect sources.

Earthquakes  
 - Earthquake waves  
 - Shadow zone

Earthquake  
 - Types of Earthquakes  
 - Measuring Earthquakes  
 - Effects of Earthquakes

Structure of the earth

Volcanoes and volcanic landforms  
 - Types of Volcanoes  
 - Intrusive volcanic landforms

**Process/Activities**

Discussion based on the previous knowledge and reading materials and prepares discussion notes.

Watching documentaries and animations regarding earthquake and preparing observation notes.  
 Illustration of the propagation of earthquake waves and emergence of shadow zone.

Interactive discussion based on reading materials on earthquake and its causes  
 Watching documentaries(CD/ internet) related to earthquake and preparing notes

Demonstrating earth's structure through 3D model and group discussion based on this.  
 Illustration of the layers of the earth and preparation of notes.

Discussions based on the collection of pictures or news articles of different types of volcanoes.  
 Illustrating intrusive igneous rock forms and preparing discussion notes.

**Learning Outcome**

Eagerness to know more about the interior of the Earth

- List out and explain evidences regarding the interior of the earth.
- Distinguish the focus and epicenter of an earthquake, classify the types of earthquake waves with their properties and illustrate the shadow zone.
- Classify earthquakes based on their causes.
- Recognize different methods, of measuring earthquakes and list out the effects of earthquakes.
- Differentiate the layers of the earth, and explain its properties with illustration.
- Distinguish the types of volcanoes and illustrates and describe the intrusive igneous landforms.

## Unit Analysis

The unit can be introduced by raising some questions to test the previous knowledge of the learners and by showing animated videos on the structure of the earth.

### Sources of information about the interior.

Let the learners recall the different layers of the earth. A chart showing the structure of the earth is exhibited afterwards and ask the following questions:

- How did we come to know about the interior of the earth?
- List out the possible ways by which we gather information about the interior of the earth.

The learners actively participate in the discussion and present their views. The teacher consolidates the discussion by classifying the sources of information about the interior of the earth as follows.

### Sources of Information about the interior of the earth

#### Direct

- Mining areas
- Deep oil drilling projects
- Integrated oil drilling projects
- Volcanic eruption

#### Indirect

- Analyzing the materials obtained from deep mines
- Meteors
- The gravitational force
- Earthquake waves

The learners after internalizing the concepts notes down the same.

### Earthquake, Earthquake Waves and Emergence of Shadow Zone.

To bring attention of the learners towards the topic earthquake and earthquake waves an animation clip is shown. Interactive discussion is initiated soon after the clip channelizing to the following concepts.

- Earthquake
- Focus(hypocenter) and Epicentre
- Earthquake waves
  - Classification

- Properties and propagation of waves
- Shadow zone of earthquake waves

Illustrate the formation of Shadow zone on the blackboard. Service of talented students can be made use of for this. The learners should take down the concept derived from observation and discussion in the note book and illustrate shadow zone on a chart, which may be subjected for portfolio assessment.

### **Types of earthquakes, measuring earthquakes and effects of earthquakes.**

Let the learners watch a documentary (BBC Planet Earth - earthquake). The whole documentary is about earthquake which occurred at different times and at different places. After the documentary, the learners can be asked to list out the earthquakes they saw in the documentary and earthquake prone areas. Ask them to go through the reading materials pertaining to various reasons for earthquake occurrences and to present the types of earthquakes based on the causes of earthquakes as follows.

- Tectonic earthquake
- Volcanic earthquake
- Collapse earthquake
- Explosion earthquake
- Reservoir induced earthquake

The learners can have an idea about the scales of measuring earthquakes, and also the effects of earthquakes from watching the above said documentary. Teacher should supplement information wherever necessary. Assign the learners to make a detailed note on the causes and consequences of earthquakes and also the scales of measuring earthquakes.

### **Structure of the earth**

By exhibiting the chart showing the structure of the earth, teacher draws out the previous knowledge of the learners on the same. The class is then divided into three groups. 3D animation of the structure of the earth is presented in the class. Each group is asked to observe the layers and to note down the properties of layers assigned to them with the help of the text book. Group representatives can present their findings one by one.

- The Crust
- The Mantle
- The Core

The teacher consolidates by supplementing essential additional information and assigns the learners the tasks of making notes differentiating each layer of the earth and also to illustrate them with a neat diagram.

### **Volcanoes and volcanic landforms**

Allow the students to express their ideas on volcanoes and volcanic landforms based on their previous knowledge. Assignment for the students will be to collect pictures, news article and reading materials on volcanoes. Initiate a discussion based on the materials collected insisting on the following points.

- Volcanoes
- Volcanic landforms
- Types of volcanoes
  - Shield volcano
  - Composite volcano
  - Caldera
  - Flood basalt provinces
  - Mid oceanic ridge volcanoes

Make sure that the learners had compiled the essential notes and collected materials as part of portfolio.

The teacher can ask a student to draw the figure (Fig3.5 of text) of volcanic landforms on the board and label the landforms. The teacher explains the features of the landforms and instructs the students to copy the figure and note the features of each landform in the activity log.

### **Sample questions**

1. Identify the direct source of information about the interior of the earth.
 

a) Meteorite	b) Seismic waves
c) Volcanic materials	d) Gravity anomaly
2. A place located at  $125^{\circ}$  from the epicenter of a major earthquake does not receive both the body waves. Why? Also illustrate the concept.
3. A few minor earthquakes are said to be induced earthquakes. Mention the main causes for such tremors.

4. Distinguish
  - a) Asthenosphere and lithosphere.
  - b) Flood basalt volcanoes and Mid ocean ridge volcanoes.
5. Identify the intrusive volcanic forms.
  - a) Cooled portion of magma chamber
  - b) Near horizontal bodies of Intrusive igneous rocks
  - c) Saucer shaped intrusive body concave to the sky
  - d) Vertical wall like intrusive structure

### References

- ☞ Certificate Physical and human geography- Gohcheng Leong
- ☞ Britannica encyclopedia

