

**GEOLOGY 12**  
**UNIT 1**  
**Plate Tectonics**

**Learning Guide 3**

**Earthquakes**

**LEARNING GUIDE OUTCOMES**

On completion of Learning Guides 3 you will be able to:

- describe fault creep and elastic rebound as they relate to seismic activity.
- Describe the different earthquake waves: P, S, & L
- distinguish between magnitude and intensity
- compare and contrast Richter and Mercalli scales
- manipulate seismic data to determine distance, location and magnitude of an earthquake.
- assess the seismic risks for a particular area using: geographic location, topography, ground strength, rock types, proximity to faults, construction design.
- evaluate methods of earthquake prediction.

**EVALUATION**

1. Journal	Comp
2. Earthquake Epicentre	50%
3. Earthquake Research	50%

**RESOURCES**

1. Text: **Physical Geology & the Environment**

**LEARNING ACTIVITIES**

**Activity 1** **Journal**

1. Refer to your text **Physical Geology & the Environment** Ch. 3 Earthquakes. Read pages 65 to 101.

2. In your journal, define the following terms: *earthquake, elastic rebound theory, focus, epicenter, body waves, surface waves, P waves, S waves, Love waves, Rayleigh waves, seismograph, seismogram, intensity, Mercalli scale, magnitude, Richter scale, liquefaction, seismic sea waves.*
3. In your journal, describe what causes an earthquake.
4. In your journal, describe the differences between the two body waves (P and S) and the two surface waves (L & R).
5. In your journal, describe how to determine the epicenter of an earthquake.
6. In your journal, describe what the difference is between magnitude and intensity.
7. In your journal, list some of the different damages that earthquakes can cause.
8. In your journal, describe the relationship between earthquakes and plate tectonics.
9. In your journal, describe some of the methods that predict when an earthquake will occur.
10. Complete testing your knowledge questions #1, 2, 3, 4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22.

### **Activity 2**

### **Earthquake Epicentre**

1. Complete the assignment “Earthquake Epicentre”.

### **Activity 3**

### **Earthquake Research**

1. Research an earthquake that occurred in the last 100 years. In your write-up of the earthquake, discuss the following:
  - Where and when did the earthquake occur?
  - What was the magnitude of the earthquake?
  - What plates were involved in the earthquake? What type of plate boundary is it? Discuss the geological situation that led to the earthquake occurring.
  - What effect did the earthquake have on the people (intensity)?
  - Were there any aftershocks? If so, describe them.
  - Is this an area that experiences many earthquakes? What precautions did they take (or should have taken)?

**End of LG #3**