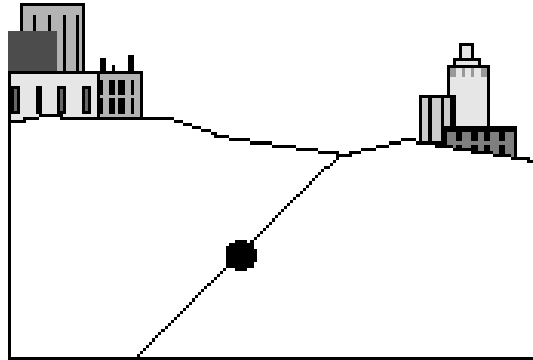


**Reading Guide for
Ch. 10: Earthquakes (p. 314)**

The Causes of Earthquakes (p. 316)

Label the epicenter and the focus on following cross-sectional diagram:



The Products of Earthquakes-Seismic Waves (p. 317)

Seismic waves that are transmitted throughout the Earth are termed _____ waves, while waves that travel only close to the Earth's surface are termed _____ waves.

Waves that create ground motion in the same direction they travel are termed _____ - waves. These waves are the fastest of all of the seismic waves. We know they are the fastest because they reach seismograph stations before all other waves. _____ - waves travel perpendicular to the motion of the ground. As your text notes, this type of wave is similar to "the wave" at a sporting event.

Most of the damage from ground motion during an earthquake occurs as a result of _____ waves.

Measuring Earthquakes-- Which Scale to Use? (p. 319)

The _____ scale is used to describe the amount of damage that occurred during an earthquake. Usually the levels of damage in this scale are noted by Roman numerals.

The _____ of an earthquake is a measure of the amount of energy released in the earthquake. The Richter scale uses a _____ to determine the magnitude. The Richter scale is logarithmic so each successive unit on the scale represents a _____ - fold increase in the amplitude of the waves. This translates to an increase of about _____ - fold in the amount of energy released from one point on the Richter scale to the next point.

There is a discussion the disadvantages of the Richter Magnitude Scale and the advantages of the Moment Magnitude Scale. I will not test you over this information, but I suggest that you read this section so that you better understand the information that is provided regarding earthquakes.

(An aside: In Table 10-2 (p. 322), the author compares the energy released from various events such as lightning, atomic bombs, and earthquakes. Although the values are interesting, to compare the values fairly one should also compare the time interval in which event occurs. For example, the eruption of Mt. St. Helens released more energy than an atomic bomb, but the interval in which the energy was released was much greater for the eruption making the energy release per second less at Mt. St. Helens.)

Locating an Earthquake's Epicenter (p. 322)

To locate an earthquake we must determine the distance the epicenter is from the recording station. Explain how this is done.

After we determine the distance, we use the distance data from at least _____ stations to find the location of the epicenter.

Earthquake Depth and Magnitude (p. 323)

In the last unit we studied that rocks have an elastic limit and if that limit is exceeded, the material breaks and released the stored energy. The rocks that are the strongest will store more of this energy than rocks that are weak. If we follow some very deep fault zones (such as subduction zones) into the Earth we find that the earthquakes generated along the fault are lower in magnitude because:

The definitions of what is a shallow, intermediate, and deep earthquake will be helpful as we study subduction zones in chapter 12, but I will not test you over this information directly.

The Effects of Earthquakes (p. 324)

Ground Displacements (p. 324)

The most obvious form of damage to buildings is when the fault movement offsets them. In this section the author also discusses what happens along the coast when there is subsidence or uplift.

Landslides and Liquefaction (p. 324)

Why are landslides common during earthquakes?

Water-saturated, fine-grained, granular soils may settle during an earthquake producing a “quick sand”-like condition known as _____. (This is a major concern in the Puget lowlands-- especially in the river valleys and areas that have been filled by humans)

Seiches (p.326)

You will not be tested over this part

Tsunami (p. 327)

Most tsunami originate from:

Describe what happens when a tsunami approaches the coast.

Fires (p. 329)

Why are fires such a problem after an earthquake?

The World’s Principal Earthquake Zones (p.332)

Earthquake Zones at Plate Boundaries (p.332)

The pattern of earthquakes that follow a subducting plate from shallow at the point of subduction to deep under the over-riding plate is called the _____ zone.

Almost all major earthquakes occur along _____ and _____ plate boundaries.

I would encourage you to read the remainder of this section, but I will not test you over the details.

Coping with the Threat of Earthquakes (p.337)

I recommend reading the Table 10-4 (p. 338). Consider doing some of the items in the “What to do Before an Earthquake” section and you should know steps to take during and after a quake. Don’t memorize the list-- I will not test you over the details in this table-- it is just information you should know as a resident of an earthquake prone region.

Limiting Earthquakes Caused by Humans (p.337)

An interesting case history in Denver, but I will not test you over the details in this section.

Determining Seismic Frequency (p.337)

Note the similarity in concept to the volcanic eruptions and river lab we studied earlier this quarter. They even use the same term recurrence interval!

What are some types of geological evidence that we can use to determine if a fault has been active?

Building in an Earthquake Zone (p.342)

When seismic waves pass through loose, wet soils there is usually _____ (more/less) shaking than on bedrock. There will usually be more building destruction in areas which have what types of substrate?

The amount of damage sustained by a building is dependent on:

1)

2)

3)

In general, buildings that are built to _____ (move/not move) during the earthquake are safer. What are some of the characteristics of buildings that tend to fail during earthquakes?

Earthquake Prediction: The Best Defense (p.344)

All predictions are based on observation of some phenomena, then observing some type of change just prior to the event. Would you do anything different if an earthquake were predicted? You do not have to answer this—just think about your response.

What is a “seismic gap” and how is it used to predict region that will have earthquakes?

Read the remainder of the chapter on earthquakes, but you will not be tested over this information.