**Chapter 1.1 - Inside Earth**

**Directions:**

* Read **Chapter 1.1- Inside Earth**.
* Answer the following questions from the reading.

**Lesson 1.1: True or False**

***Write T if the statement is true or F if the statement is false.***

\_\_\_\_\_ 1. Earth is divided by composition into three layers.

\_\_\_\_\_ 2. P-waves are the first seismic waves to reach a seismometer.

\_\_\_\_\_ 3. S-waves travel more slowly through liquids than solids.

\_\_\_\_\_ 4. The lithosphere is thinner than the crust.

\_\_\_\_\_ 5. The mantle is heated mainly by heat conducted from the core.

\_\_\_\_\_ 6. The outer core has a higher temperature than the inner core.

\_\_\_\_\_ 7. S-waves cannot travel through the outer core.

\_\_\_\_\_ 8. Radioactive elements break down in the inner core.

\_\_\_\_\_ 9. Ancient meteorites are thought to be similar to Earth’s crust.

\_\_\_\_\_ 10. The core makes up about two-thirds of Earth by mass.

**Lesson 1.1: Critical Reading**

***Read the passage below based on the text and answer the questions that follow.***

**Exploring Earth’s Interior with Seismic Waves**

How do scientists know what is inside Earth? They don’t have much direct evidence. Rocks yield some clues but mainly just about the upper crust. Only in rare instances does a mineral, such as diamond, come to the surface from the lower crust or mantle. Scientists know about Earth’s interior mainly from indirect evidence such as seismic waves. Seismic waves are caused by the energy from earthquakes traveling through the ground. Seismic waves travel outward in all directions from the point where the ground breaks in an earthquake. The waves are detected by seismometers around the world. Two types of seismic waves are most useful for learning about Earth’s interior: P-waves and S-waves.

* P-waves (primary waves) are the fastest seismic waves, so they are always the first waves to arrive at seismometers. P-waves travel more slowly through liquids than solids.
* S-waves (secondary waves) are only about half as fast as P-waves, so they always arrive later at seismometers. S-waves cannot travel through liquids at all.

By tracking seismic waves with seismometers all over Earth, scientists have learned important information about the planet’s interior. For example, P-waves slow down as they pass from the mantle to the outer core, so scientists know that the outer core is liquid whereas the mantle is solid. Another clue that the outer core is liquid is that S-waves stop at the mantle-core boundary.

**Questions about the Passage**

1. How do scientists know about Earth’s interior?

2. Compare and contrast P-waves and S-waves.

3. Explain how scientists were able to learn from seismic waves that the mantle is solid and the

outer core is liquid.

**Lesson 1.1: Multiple Choice**

***Circle the letter of the correct choice.***

1. Scientists know about Earth’s interior by studying evidence from

1. meteorites.
2. seismic waves.
3. Earth’s magnetic field.
4. all of the above

2. Which layer of Earth is the thinnest?

1. crust
2. mantle
3. inner core
4. outer core

3. The oceanic crust consists of rocks called

1. basalt.
2. granite.
3. gabbro.
4. two of the above

4. Relative to the oceanic crust, the continental crust

1. is thinner.
2. has greater denser.
3. has less variety of rocks.
4. rises higher on the mantle.

5. The lithosphere is

1. soft.
2. brittle.
3. bendable.
4. two of the above

6. Earth’s mantle

1. consists of liquid rock.
2. is hotter than the crust.
3. is made of granite.
4. all of the above

7. Which statement about Earth’s core is false?

1. It is made of metal.
2. It is Earth’s hottest layer.
3. It consists mostly of iron.
4. It gets its heat from the sun.

**Lesson 1.1: Matching**

***Match each definition with the correct term.***

|  |  |
| --- | --- |
| D**efinitions**  \_\_\_\_\_ 1. Earth’s outermost layer  \_\_\_\_\_ 2. rock from space that has struck Earth  \_\_\_\_\_ 3. Earth’s middle layer  \_\_\_\_\_ 4. rigid part of Earth that consists of the crust and upper mantle  \_\_\_\_\_ 5. how energy travels away from an earthquake  \_\_\_\_\_ 6. part of the upper mantle that can flow  \_\_\_\_\_ 7. Earth’s innermost layer | **Terms**  a. crust  b. lithosphere  c. mantle  d. meteorite  e. asthenosphere  f. core  g. seismic wave |

**Lesson 1.1: Fill in the Blank**

***Fill in the blank with the appropriate term.***

1. The part of Earth’s crust that consists of mafic rock is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ crust.

2. The part of Earth’s crust that consists of felsic rock is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ crust.

3. The layer of Earth that consists of ultramafic rock is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

4. Heat is transferred throughout the mantle by the process of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

5. The densest layer of Earth is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

6. Convection currents in Earth’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ core give Earth a magnetic field.

7. The part of Earth’s core that is solid is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ core.

**Lesson 1.1: Critical Writing**

***Thoroughly answer the writing prompt below. Use appropriate academic vocabulary and clear and complete sentences.***

***Prompt:*** Relate the lithosphere and asthenosphere to Earth’s crust and mantle.