

## Earth Science Chapter 7 - Heat Inside Earth - Quiz Questions (#1- #5)

### Front - Question

Q1-1: is Earth's radius in kilometers?  
Miles?  
( 1km = 0.62 miles)

f  
o  
l  
d

### Back - Answer

A1-1: 6,400 km .... or...  
3,968 miles

Q1-2: Answer these questions about vibrations that travel through the earth:  
a.) What are these vibrations called?  
b.) What causes them?  
c.) What have these vibrations revealed about Earth's interior?

f  
o  
l  
d

A1-2: a. seismic waves  
b. earthquakes & human blasts  
c. That the outer core must be liquid.

Q1-3: What is a seismologist?

f  
o  
l  
d

A1-3: A scientist who detects and interprets ground vibrations at different locations on the Earth's surface.

Q1-4: During wave motion, what moves from one place to another?

f  
o  
l  
d

A1-4: A disturbance

Q1-5: What are the two general types of wave motion described in this section?

f  
o  
l  
d

A1-5: a) side to side; and,  
b) back and forth

Q1-6: Give three facts about each type of wave.

f  
o  
l  
d

A1-6: P-waves: 1) faster than S; 2) back & forth motion; 3) travel through all materials. S-waves: 1) slower than P-waves; 2) side to side motion; 3) cannot travel through liquids

Q1-7: P-waves travel at 5 km/sec and S-waves travel at 3 km/sec. A seismic station is located 30 km from where an earthquake occurred. (a). How many seconds would it take for the P-waves to reach the station? (b.) How many seconds would it take for the S-waves to reach the station?

f  
o  
l  
d

A1-7:  
a) 6 seconds  
b) 10 seconds

Q1-8: What can happen to seismic waves as they travel through the Earth?

f  
o  
l  
d

A1-8: Seismic waves can be bent, slowed down, sped up, or bounced depending on the material they encounter.

Q1-9: What are S-shadows? Create a diagram and explain it.

f  
o  
l  
d

A1-9: Regions where scientists cannot detect S-waves. They cannot pass through liquids.

Q1-10: What do S-shadows tell us about the interior of Earth?

f  
o  
l  
d

A1-10: The Earth's outer core is liquid.

Q2-1: Diagrams of Earth's interior show three layers. Name the 3 layers.

f  
o  
l  
d

A2-1: crust, mantle, & core

Q2-2: Use the diagram on page 145 to help you answer the following questions. (a.) What layers compose Earth's core? (b.) The upper mantle and crust make up which layer of Earth's interior? (c.) What is the name of the thickest layer of Earth's interior?

f  
o  
l  
d

A2-2: a) inner & outer core; b) lithosphere; c) lower mantle

Q2-3: How thick is the outer core in kilometers?

f  
o  
l  
d

A2-3: 2,200 km

Q2-4: Which is thicker – oceanic crust or continental crust?

f  
o  
l  
d

A2-4: continental crust

Q2-5: Is the crust brittle? (Yes or No). Why is this? Do earthquakes occur in the crust?

f  
o  
l  
d

A2-5: Yes, because it is made of cooled rock. Earthquakes occur in the crust.

Q2-6: Plates that move about Earth's surface are pieces of \_\_\_\_\_.

f  
o  
l  
d

A2-6: lithosphere

Q2-7: What is the aesthenosphere and why is it important?

f  
o  
l  
d

A2-7: It is made up of the lower mantle & is the slippery surface atop which the lithospheric plates move.

Q2-8: What material makes up most of the outer core? Is it solid or liquid? Why?

f  
o  
l  
d

A2-8: molten iron -- liquid due to the high temperature

Q2-9: What material makes up most of the inner core? Is it solid or liquid? Why?

f  
o  
l  
d

A2-9: solid iron due to high pressure

Q2-10: What very important process happens in the outer core? Why is it important?

f  
o  
l  
d

A2-10: The movement of liquid iron in the outer core creates electric currents and forms a magnetic field around Earth. This field shields us from harmful solar radiation.

Q3-1: Explain how the young Earth separated into layers. Use the term density in your answer.

f  
o  
l  
d

A3-1: Heavier materials sank and formed the core. Lighter materials rose to the surface, cooled & hardened into crust.

Q3-2: Draw a simplified diagram of Earth's interior: a.) Indicate where on the diagram you would find aluminum & silicon & iron. b.) Using the following density values (Al-2.7, Si-2.3, Fe-7.9, H<sub>2</sub>O-1.0) to explain why water floats on the earth's surface. c.) How does the density of the mantle compare to densities of the crust & core?

f  
o  
l  
d

A3-2: a) Al & Si on the crust, Fe in the core; b) water is less dense; c) less dense than the mantle and more dense than the crust

Q3-3: What kind of rock makes up the ocean floor?

f  
o  
l  
d

A3-3: basalt

Q3-4: What kind of rock makes up the continents?

f  
o  
l  
d

A3-4: granite

Q3-5: Can rocks float? Explain.

f  
o  
l  
d

A3-5: Yes -- depends on density

Q3-6: What might happen to a mountain that would cause the crust to float higher in the mantle?

f  
o  
l  
d

A3-6: Mountains weigh a lot and push the crust down. When they erode, they become lighter and the crust floats higher.

Q3-7: What might happen to a glacier that would cause the crust to float higher in the mantle?

f  
o  
l  
d

A3-7: Glaciers weigh a lot and push the crust down. As they melt they weigh less and so the crust floats higher.

Q3-8: What process drives the lithospheric plates across the surface of the earth? Draw a diagram of this process.

f  
o  
l  
d

A3-8: Convection currents of molten rock in the mantle drive the plates across the Earth's surface.

Q3-9: What is seismic tomography?

f  
o  
l  
d

A3-9: seismic waves allow us to get a 3-D image of Earth's interior.

Q3-10: How is a CAT scan like seismic tomography?

f  
o  
l  
d

A3-10: A CAT scan uses x-rays to get a 3-D image of inside the human body. Seismic tomography uses seismic waves to get a 3-D image of the interior of Earth.

Q4-1: Seismic waves that do not pass through liquids.

f  
o  
l  
d

A4-1: S-waves

Q4-2: A scientist that detects and interprets seismic waves.

f  
o  
l  
d

A4-2: seismologist

Q4-3: Vibrations that travel through Earth.

f  
o  
l  
d

A4-3: seismic waves

Q4-4: Forward-and-backward seismic waves.

f  
o  
l  
d

A4-4: P-waves

Q4-5: Side-to-side seismic waves.

f  
o  
l  
d

A4-5: S-waves

Q4-6: Largest part of Earth's interior that is made of rock.

f  
o  
l  
d

A4-6: mantle

Q4-7: The inner iron-containing layer of Earth.

f  
o  
l  
d

A4-7: core

Q4-8: Makes up plates that move about Earth's surface. (Crust & upper mantle)

f  
o  
l  
d

A4-8: lithosphere

Q4-9: Outermost surface of Earth.

f  
o  
l  
d

A4-9: crust

Q4-10: You can create an up-and-down wave by wiggling a jump rope. What travels from one place to another during wave motion? What stays in place?

f  
o  
l  
d

A4-10: energy travels, the jump rope stays in place

Q4-11: For each of these statements write either P-wave or S-wave:

- Travels through all material --
- Does NOT travel in liquids --
- Forward-and-backward motion
- Side-to-side motion --
- Slower --
- Faster --

f  
o  
l  
d

A4-11: a) p-wave; b) s-wave; c) p-wave; d) s-wave; e) s-wave; f) p-wave

Q4-12: What causes the Earth's magnetic field? Why is the magnetic field important?

f  
o  
l  
d

A4-12: Powerful electric currents formed by the motion of liquid iron in the outer core. This shield us from the sun's harmful radiation.

Q4-13: Why isn't the inner core a liquid like the outer core?

f  
o  
l  
d

A4-13: Melting of a solid depends on pressure and temperature. Although the temperature is very high, so is the pressure -- keeping it a solid.

Q4-14: What are the differences between continental & oceanic crust?

f  
o  
l  
d

A4-14: Continental crust is thicker at 30km & made mostly of granite. Oceanic crust is thinner at 5km deep, is made of basalt, & is denser.

Q4-15: What do you think would happen if there were no convection in Earth's mantle?

f  
o  
l  
d

A4-15: Fewer or no mountains, no earthquakes & no volcanoes

Q4-16: Tell why these events in Jules Verne's story, Journey to the Center of the Earth, are NOT possible: a.) Entered Earth through an opening in a volcano. b.) Climbed down through many strange chambers. c.) Crossed an ocean at the center of Earth. d.) Escaped to the surface by riding a volcanic eruption.

f  
o  
l  
d

A4-16: a) Bogus -- the gases would kill you; b) Possible, but the heat would kill you; c) bogus -- the heat would vaporize water (at 212 degrees F); d) The lava would melt your escape pod & you would die.

Q5-1: Author of Journey to the Center of the Earth. Lots of scientific inaccuracies but it did get people interested in science.

f  
o  
l  
d

A5-1: Jules Verne

Q5-2: Vibrations that travel through Earth and are caused by events like earthquakes or human-made blasts.

f  
o  
l  
d

A5-2: seismic waves

Q5-3: A scientist who detects and interprets seismic waves.

f  
o  
l  
d

A5-3: seismologist

Q5-4: A movement that begins in one location and sets things in motion farther away.

f  
o  
l  
d

A5-4: disturbance

Q5-5: Fast forward-and-backward seismic waves

f  
o  
l  
d

A5-5: P-waves

Q5-6: Slower side-to-side seismic waves

f  
o  
l  
d

A5-6: S-waves

Q5-7: The outermost surface of the earth

f  
o  
l  
d

A5-7: crust

Q5-8: The warm, soft enough to flow, solid layer of Earth between the crust and the core

f  
o  
l  
d

A5-8: mantle

Q5-9: The center of the Earth, divided into inner and outer layers.

f  
o  
l  
d

A5-9: core

Q5-10: An area that blocks s-waves from passing through

f  
o  
l  
d

A5-10: S-shadow

Q5-11: A layer of Earth that includes the crust and upper mantle

f  
o  
l  
d

A5-11: lithosphere

Q5-12: The outermost part of the lower mantle. A slushy, slippery zone that allows lithospheric plates to slide.

f  
o  
l  
d

A5-12: aesthenosphere

Q5-13: An upwelling of mantle material heated by the core that forces tectonic plates to move across Earth's surface.

f  
o  
l  
d

A5-13: plume

Q5-14: The use of seismic waves to get a 3-D view of Earth's interior.

f  
o  
l  
d

A5-14: seismic tomography

Q5-15: A boundary between Earth's crust and the upper mantle.

f  
o  
l  
d

A5-15: Mohorovicic discontinuity (Moho)

Q5-16: The transfer of heat through liquids & gases

f  
o  
l  
d

A5-16: convection

Q5-17: Mass of an object divided by its volume

f  
o  
l  
d

A5-17: density