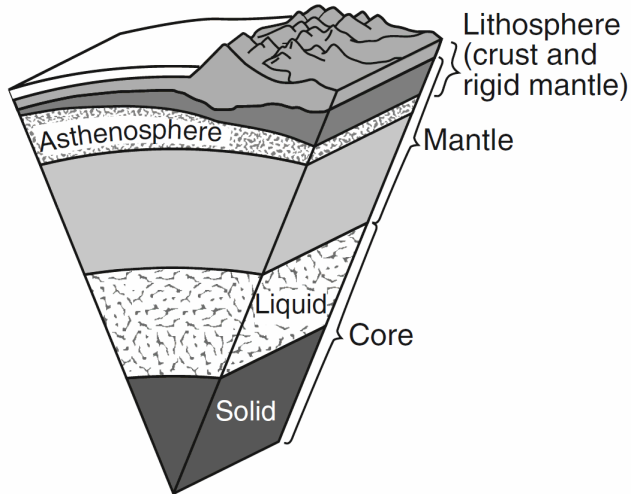


1. Which two Earth layers are separated by the Moho boundary?
  - A) rigid mantle and plastic mantle
  - B) outer core and stiffer mantle
  - C) stiffer mantle and asthenosphere
  - D) crust and rigid mantle
  
2. A model of Earth's internal structure is shown below.



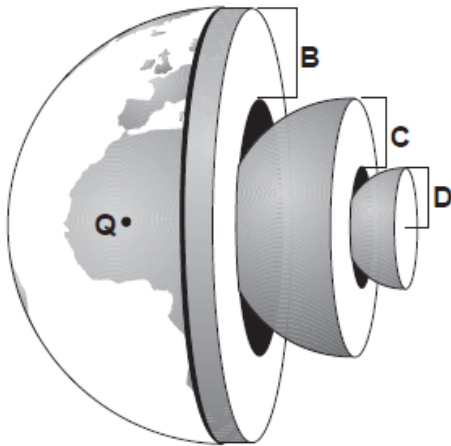
(Not drawn to scale)

Analysis of which type of data led to the development of this model?

- A) seismic waves
- B) depth of Earth's oceans
- C) electromagnetic radiation
- D) isobar gradients

Name: \_\_\_\_\_

3. Base your answer to the following question on the diagram of Earth shown below. Letters *B*, *C*, and *D* represent layers of Earth. Letter *Q* represents a location on Earth's surface.

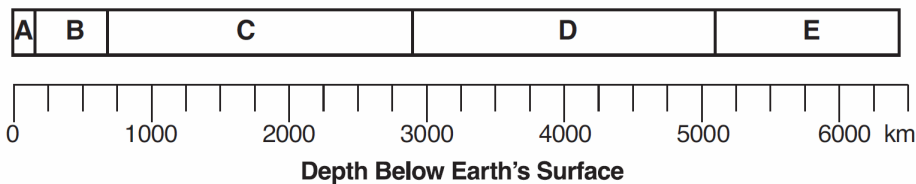


Which letter best represents Earth's mantle?

- A) *Q*                      B) *B*                      C) *C*                      D) *D*

4. Which part of Earth's interior is inferred to have convection currents that cause tectonic plates to move?
- A) rigid mantle                      B) asthenosphere  
C) outer core                      D) inner core
5. Compared to the oceanic crust, the continental crust is usually
- A) thicker, with a less dense granitic composition  
B) thicker, with a more dense basaltic composition  
C) thinner, with a less dense granitic composition  
D) thinner, with a more dense basaltic composition
7. Which statement most accurately compares Earth's crust and Earth's mantle?
- A) The crust is thinner and less dense than the mantle.  
B) The crust is thinner and more dense than the mantle.  
C) The crust is thicker and less dense than the mantle.  
D) The crust is thicker and more dense than the mantle.
6. Base your answer to the following question on the diagram below, which represents zones of Earth's interior, identified by letters *A* through *E*. The scale shows depths below Earth's surface, measured in kilometers.

**Zones of Earth's Interior**

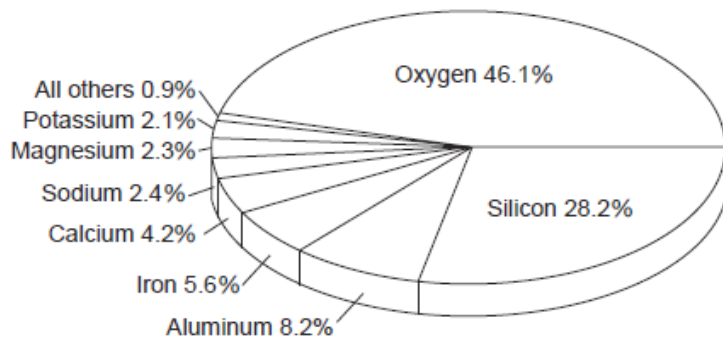


What is the approximate thickness of zone *C*?

- A) 650 km                      B) 1600 km                      C) 2250 km                      D) 2900 km

Name: \_\_\_\_\_

8. The pie graph below represents the composition, in percent by mass, of the chemical elements found in an Earth layer.



The composition of which Earth layer is represented by the pie graph?

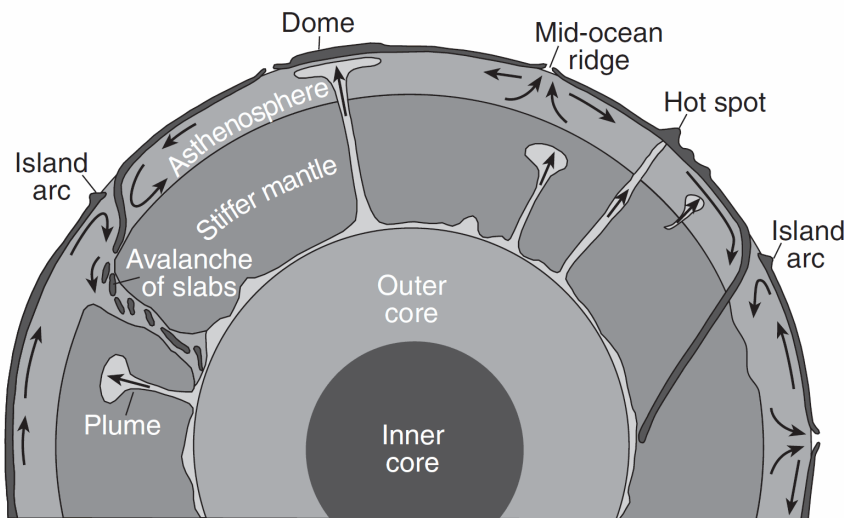
- A) crust      B) outer core      C) troposphere      D) hydrosphere
- 
9. Which minerals contain the two most abundant elements by mass in Earth's crust?
- A) fluorite and calcite  
B) magnetite and pyrite  
C) amphibole and quartz  
D) galena and sulfur
10. The interior of Earth between a depth of 5200 kilometers and 6300 kilometers is inferred to be composed mostly of
- A) silicon and iron      B) silicon and oxygen  
C) iron and lead      D) iron and nickel
11. Compared to the average density and composition of oceanic crust, continental crust is
- A) less dense and more felsic  
B) less dense and more mafic  
C) more dense and more felsic  
D) more dense and more mafic
12. The pressure at the interface between Earth's outer core and inner core is inferred to be
- A) 0.2 million atmosphere  
B) 1.5 million atmospheres  
C) 3.1 million atmospheres  
D) 3.6 million atmospheres
13. What caused the interior of Earth to separate into layers?
- A) a decrease in the rate of rotation of Earth  
B) the gravitational pull on materials of varying densities  
C) variations in heating by the Sun due to Earth's tilt  
D) collisions with meteors and comets
14. The inferred temperature and pressure of Earth's interior at a depth of 3,000 kilometers are approximately
- A) 1000°C and 0.5 million atmospheres  
B) 1000°C and 1.0 million atmospheres  
C) 5000°C and 1.5 million atmospheres  
D) 5000°C and 3.0 million atmospheres
15. Earth's interior at a depth of 3500 kilometers is believed to be
- A) liquid at a temperature of approximately 4900°C  
B) solid at a temperature of approximately 4900°C  
C) liquid at a temperature of approximately 5400°C  
D) solid at a temperature of approximately 5400°C

Name: \_\_\_\_\_

Base your answers to questions 16 and 17 on the passage and cross section below and on your knowledge of Earth science. The cross section represents one theory of the movement of rock materials in Earth's dynamic interior. Some mantle plumes that are slowly rising from the boundary between Earth's outer core and stiffer mantle are indicated.

### Hot Spots and Mantle Plumes

Research of mantle hot spots indicates that mantle plumes form in a variety of sizes and shapes. These mantle plumes range in diameter from several hundred kilometers to 1000 kilometers. Some plumes rise as blobs rather than in a continuous streak; however, most plumes are long, slender columns of hot rock slowly rising in Earth's stiffer mantle. One theory is that most plumes form at the boundary between the outer core and the stiffer mantle. They may reach Earth's surface in the center of plates or at plate boundaries, producing volcanoes or large domes.



(Not drawn to scale)

16. The basaltic rock that forms volcanic mountains where mantle plumes reach Earth's surface is usually composed of
- A) fine-grained, dark-colored felsic minerals
  - B) fine-grained, dark-colored mafic minerals
  - C) coarse-grained, light-colored felsic minerals
  - D) coarse-grained, light-colored mafic minerals
17. Compared to the surrounding material, mantle plumes rise toward Earth's surface from the core-mantle boundary because they are
- A) cooler and less dense
  - B) cooler and more dense
  - C) hotter and less dense
  - D) hotter and more dense

**Name:**

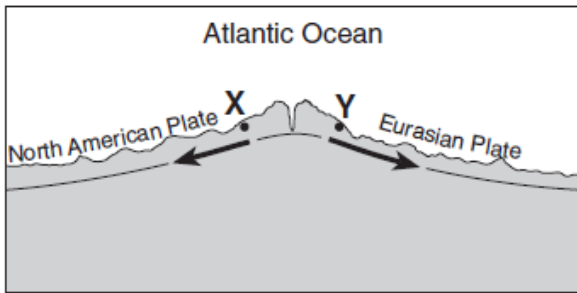
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18. Earth's inner core is inferred to be solid based on the analysis of

- A) seismic waves
  - B) crustal rocks
  - C) radioactive decay rates
  - D) magnetic pole reversals
-

Name: \_\_\_\_\_

19. Base your answer to the following question on cross section below, which shows an underwater mountain range in the Atlantic Ocean. The oceanic bedrock is composed mainly of basalt. Points *X* and *Y* are locations in the bedrock that have been diverging at the same rate. The movement of the North American Plate and Eurasian Plate is shown by the two arrows.



( Not drawn to scale)

Which cross section best represents the relative locations of Earth's asthenosphere, rigid mantle, and stiffer mantle? (The cross sections are not drawn to scale.)

- A) 

B) 

C) 

D)

**Name:**

---

20. The Earth's core is believed to be composed primarily of

- A) oxygen and silicon
  - B) aluminum and silicon
  - C) iron and nickel
  - D) carbon and iron
-