

Introduction to Environmental Geology, 5e (Keller)

Chapter 2 Internal Structure of Earth and Plate Tectonics

2.1 Multiple-Choice Questions

1) What is the principal difference between the inner core and outer core?

- A) The inner core consists mainly of iron and nickel, while the outer core consists mainly of silicate minerals.
- B) The inner core consists mainly of silicate minerals, while the outer core consists mainly of iron and nickel.
- C) The inner core is solid while the outer core is liquid.
- D) The inner core is liquid while the outer core is solid.

Answer: D

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Section Number: 2.1

Bloom's Taxonomy: Understanding

2) The Mohorovicic discontinuity represents

- A) the boundary between inner and outer cores
- B) the boundary between mantle and crust
- C) the boundary between lithosphere and hydrosphere
- D) the boundary between outer core and mantle

Answer: B

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Section Number: 2.1

Bloom's Taxonomy: Remembering

3) How does the lithosphere differ from the asthenosphere?

- A) The lithosphere is stronger than the asthenosphere.
- B) The asthenosphere is stronger than the lithosphere.
- C) The asthenosphere is part of the core, while the lithosphere is part of the mantle.
- D) The asthenosphere is less dense than the lithosphere.

Answer: A

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Section Number: 2.1

Bloom's Taxonomy: Understanding

4) Which type of earthquake wave moves fastest?

- A) P-wave
- B) S-wave
- C) L-wave
- D) R-wave

Answer: A

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Section Number: 2.2

Bloom's Taxonomy: Remembering

- 5) How do seismologists know the outer core is liquid?
- A) P-waves are refracted upon arrival in the outer core
 - B) S-waves are absorbed upon arrival in the outer core
 - C) both S-waves and P-waves speed up in the outer core
 - D) both S-waves and P-waves slow down in the outer core

Answer: B

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Section Number: 2.2

Bloom's Taxonomy: Understanding

- 6) Why was Alfred Wegener's hypothesis of continental drift not taken seriously by most geologists?

- A) his evidence for former joining of the continents was faulty
- B) because it was and is known that continents do not move
- C) his mechanism for movement of the continents was faulty
- D) he was not a well-respected scientist

Answer: C

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Section Number: 2.3

Bloom's Taxonomy: Understanding

- 7) How did seafloor spreading revive Alfred Wegener's ideas about continental drift?

- A) Sea floor spreading relied on new fossil evidence documenting the former joining of the continents.
- B) Sea floor spreading provided an explanation for the consumption of oceanic crust at plate boundaries.
- C) The topography of the ocean floor demonstrated that mountain ranges on either side of the Atlantic Ocean were formerly joined.
- D) Sea floor spreading prevented a viable mechanism for moving the continents.

Answer: D

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Section Number: 2.3

Bloom's Taxonomy: Understanding

- 8) At convergent plate boundaries

- A) the plate of higher density subducts into the mantle
- B) the plate of lower density subducts into the mantle
- C) new oceanic crust is created
- D) magnetic stripes are generated in oceanic rocks

Answer: B

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Section Number: 2.3

Bloom's Taxonomy: Understanding

9) Transform plate boundaries are marked by

- A) volcanic island arcs
- B) consumption of oceanic crust
- C) creation of oceanic crust
- D) two plates sliding relative to one another

Answer: D

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Section Number: 2.3

Bloom's Taxonomy: Understanding

10) How do magnetic stripes on the ocean floor serve as evidence for seafloor spreading?

- A) Their symmetry on either side of the mid-ocean ridge shows that new crust is created, then split.
- B) Their patterns show that the Earth's magnetic field reverses every few hundred years, on average.
- C) They show that island arc volcanism creates new oceanic crust at the mid-ocean ridges.
- D) Their symmetry on either side of mid-ocean ridges shows that transform boundaries are sliding boundaries.

Answer: A

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Section Number: 2.4

Bloom's Taxonomy: Understanding

11) Hot spots are recorded by

- A) extensive earthquake hazards
- B) mantle rock exposed at the Earth's surface
- C) rock from the outer mantle included in volcanic rocks
- D) a sequence of volcanic centers younging toward the hot spot

Answer: A

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Section Number: 2.4

Bloom's Taxonomy: Applying

12) The process of isostasy is responsible for

- A) moving plates apart at a divergent margin
- B) creating volcanoes at a hot spot
- C) causing rock uplift in mountain ranges in response to erosion
- D) causing compressive stresses at convergent boundaries

Answer: C

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Section Number: 2.3

Bloom's Taxonomy: Understanding

13) Tectonic plates move about as fast as

- A) a car moves on a city street
- B) fingernails grow
- C) a swallow flies
- D) a tortoise walks

Answer: B

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Section Number: 2.3

Bloom's Taxonomy: Remembering

14) When did the supercontinent Pangaea start breaking apart?

- A) 4.6 billion years ago
- B) 560 million years ago
- C) 180 million years ago
- D) 65 million years ago

Answer: C

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Section Number: 2.5

Bloom's Taxonomy: Remembering

15) What driving force of plate movement is likely dominant?

- A) ridge push
- B) slab pull
- C) mountain rise
- D) valley fall

Answer: B

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Section Number: 2.6

Bloom's Taxonomy: Understanding

2.2 True/False Questions

1) The rocks of the core are more dense than the rocks of the mantle.

Answer: TRUE

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Section Number: 2.1

Bloom's Taxonomy: Remembering

2) The asthenosphere is stronger than the lithosphere.

Answer: FALSE

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Section Number: 2.1

Bloom's Taxonomy: Remembering

3) S-waves accelerate as they enter the outer core.

Answer: FALSE

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Section Number: 2.2

Bloom's Taxonomy: Understanding

4) Alfred Wegener proposed the idea of sea floor spreading.

Answer: FALSE

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Section Number: 2.3

Bloom's Taxonomy: Understanding

5) Crust is consumed at transform boundaries.

Answer: FALSE

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Section Number: 2.3

Bloom's Taxonomy: Remembering

6) A submarine trench is associated with a convergent boundary.

Answer: TRUE

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Section Number: 2.3

Bloom's Taxonomy: Remembering

7) The Earth's magnetic field reverses in a regular pattern every few hundred thousand years.

Answer: FALSE

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Section Number: 2.3

Bloom's Taxonomy: Remembering

8) The concept of seafloor spreading was supported by magnetic polarity stripes on the ocean floor.

Answer: TRUE

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Section Number: 2.4

Bloom's Taxonomy: Understanding

9) The Hawaiian Islands are a volcanic arc atop an oceanic subduction zone.

Answer: FALSE

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Section Number: 2.4

Bloom's Taxonomy: Understanding

10) Plate tectonic processes can affect climate.

Answer: TRUE

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Section Number: 2.7

Bloom's Taxonomy: Understanding

11) New oceanic lithosphere is generated at mid-ocean ridges.

Answer: TRUE

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Section Number: 2.3

Bloom's Taxonomy: Remembering

12) Transform boundaries do not generate earthquakes.

Answer: FALSE

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Section Number: 2.3

Bloom's Taxonomy: Remembering

13) Deep (>200 km) earthquakes can only be found at a convergent boundary.

Answer: TRUE

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Section Number: 2.3

Bloom's Taxonomy: Understanding

14) Only a few transform boundaries (<10) mark the Earth's tectonic plates.

Answer: FALSE

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Section Number: 2.3

Bloom's Taxonomy: Understanding

2.3 Short Answer Questions

1) The rocks of the core consist mostly of _____.

Answer: iron

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Section Number: 2.1

Bloom's Taxonomy: Remembering

2) The _____ separates the mantle and the crust.

Answer: Moho

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Section Number: 2.1

Bloom's Taxonomy: Remembering

3) A change in the direction of wave travel at the core-mantle boundary is called _____.

Answer: refraction

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Section Number: 2.2

Bloom's Taxonomy: Understanding

4) _____-waves pass through the outer core.

Answer: P

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Section Number: 2.2

Bloom's Taxonomy: Understanding

5) Convergence of plates can cause _____ forces that build mountain ranges.

Answer: compressive

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Section Number: 2.3

Bloom's Taxonomy: Remembering

6) _____ can cause uplift in a mountain range through isostatic compensation.

Answer: erosion

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Section Number: 2.3

Bloom's Taxonomy: Applying

7) A(n) _____ is a location where three plates border one another.

Answer: triple junction

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Section Number: 2.3

Bloom's Taxonomy: Remembering

8) At the Curie point, iron-bearing minerals orient themselves parallel to the _____.

Answer: magnetic field

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Section Number: 2.4

Bloom's Taxonomy: Understanding

9) The volcano called _____ is the youngest of the Hawaiian volcanoes.

Answer: Loihi

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Section Number: 2.4

Bloom's Taxonomy: Remembering

10) The supercontinent Pangaea consisted of Laurasia and _____.

Answer: Gondwana

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Section Number: 2.5

Bloom's Taxonomy: Remembering

11) Yellowstone National Park lies atop a(n) _____.

Answer: continental hot spot

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Section Number: 2.4

Bloom's Taxonomy: Understanding

12) The Cascade Mountains are part of a(n) _____ convergent boundary.

Answer: ocean-continent

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Section Number: 2.3

Bloom's Taxonomy: Understanding

13) The San Andreas Fault is a(n) _____ boundary.

Answer: transform

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Section Number: 2.3

Bloom's Taxonomy: Remembering