

Essentials of Oceanography, 12e (Trujillo)
Chapter 2 Plate Tectonics and the Ocean Floor

2.1 Matching Questions

Match the term with the appropriate phrase. Not all answers will be used.

- A) subduction zone
- B) Pangaea
- C) Panthalassia
- D) paleomagnetism
- E) rift valley

1) ancient precursor of the Pacific Ocean

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

2) supercontinent 250 million years ago

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

Global Sci Out: 7

3) depression along a ridge axis

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

Global Sci Out: 7

4) study of magnetism over geologic time

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

5) sloping area from a trench along a downward moving plate

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

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Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

Answers: 1) C 2) B 3) E 4) D 5) A

Match the term with the appropriate phrase. Not all answers will be used.

A) spreading center
B) subduction zone

6) island arc

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

Global Sci Out: 7

7) mid-ocean ridge

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

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Global Sci Out: 7

8) seafloor magnetic stripes

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

9) seafloor spreading

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

10) trench

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

Answers: 6) B 7) A 8) A 9) A 10) B

2.2 Multiple Choice Questions

1) The first person to advance the idea of mobile continents or continental drift was _____.

- A) Harry Hess
- B) Frederick Vine
- C) Alfred Wegener
- D) Drummond Matthews
- E) John Tuzo Wilson

Answer: C

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

2) Which of the following was not used as evidence for continental drift?

- A) The fit of the continents
- B) Matching sequences of rocks
- C) Past glacial activity
- D) The distribution of organisms
- E) Paleomagnetic reversals

Answer: E

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

3) Fossils of ancient polar plants are currently found near the equator because the _____.

- A) entire earth had polar conditions at the time the plants were living
- B) plants lived near the poles, but landmasses have drifted to current locations
- C) plants probably were tolerant of both tropical and polar conditions
- D) plants were distributed to current locations by ancient glacial ice sheets
- E) poles were at the equator at times in the geologic past

Answer: B

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

4) All continents fit together with the least number of overlaps and gaps when the continents are matched along _____.

- A) edges at around 2,000 meters depth
- B) current shorelines
- C) the edge of the continental shelf
- D) edges of the deep sea floor
- E) oceanic trenches in subduction zones

Answer: A

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

5) Climate distribution on Earth is primarily controlled by _____.

- A) Earth's geologic history
- B) latitude
- C) longitude
- D) presence or absence of glacial debris
- E) plants and animals that live in an area

Answer: B

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

6) Wegener used which of the following to provide evidence for continental drift?

- A) Earthquake distribution
- B) Magnetic pole reversals
- C) Locations of active volcanoes
- D) Seafloor magnetic patterns
- E) Shape of continental margins

Answer: E

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

7) The book *The History of Ocean Basins*, which contained the idea of seafloor spreading, was written by geologist _____.

- A) Harry Hess
- B) Frederick Vine
- C) Alfred Wegener
- D) Drummond Matthews
- E) John Tuzo Wilson

Answer: A

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

8) Frederick Vine and Drummond Matthews determined that new ocean floor was being produced at ocean ridges by examining _____.

- A) apparent polar wandering
- B) fossils in marine sediments
- C) glacial debris at various locations
- D) the location of ancient coral reefs
- E) the magnetic pattern of rocks on the seafloor

Answer: E

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

9) The seafloor magnetic pattern is best described as _____.

- A) not related to the location of mid-ocean ridges
- B) parallel to and symmetric about mid-ocean ridges
- C) parallel to, but not symmetric about mid-ocean ridges
- D) perpendicular to and symmetric about mid-ocean ridges
- E) perpendicular to, but not symmetric about mid-ocean ridges

Answer: B

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

10) Which of the following statements is TRUE of the lithosphere?

- A) The lithosphere is composed only of outer mantle material.
- B) The lithosphere is composed only of igneous rock.
- C) The lithosphere is composed only of metamorphic rock.
- D) The lithosphere is composed of the crust and the uppermost portion of the mantle.
- E) The lithosphere is composed of the inner portion of the mantle and the outer core.

Answer: D

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

11) Tectonic plates are pieces of the _____ that float on the more fluid _____ below.

- A) crust; lithosphere
- B) asthenosphere; lithosphere
- C) lithosphere; asthenosphere
- D) mantle; crust
- E) lithosphere; mesosphere

Answer: C

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

12) Moving from an oceanic ridge to an oceanic trench, the thickness of the lithosphere _____.

- A) decreases in proportion to the distance
- B) is unrelated to the distance from the ridge
- C) increases in proportion to the distance
- D) randomly varies
- E) remains the same

Answer: C

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

13) The Mid-Atlantic Ridge is an example of a _____.

- A) convergent plate boundary (continent-continent)
- B) convergent plate boundary (continent-oceanic)
- C) convergent plate boundary (oceanic-oceanic)
- D) divergent plate boundary
- E) transform fault boundary

Answer: D

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

14) Deep ocean trenches are associated with _____.

- A) rift valleys
- B) subduction zones
- C) submarine canyons
- D) transform faults
- E) turbidity currents

Answer: B

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

15) Which of the following is characteristic of oceanic-continental convergent plate boundaries?

- A) Andesitic volcanoes
- B) Fracture zones
- C) Hot spots
- D) Mid-ocean ridges
- E) Volcanic island arcs

Answer: A

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

16) Which of the following is characteristic of oceanic-oceanic convergent plate boundaries?

- A) Fracture zones
- B) Hot spots
- C) Mid-ocean ridges
- D) Volcanic island arcs
- E) Shallow earthquakes

Answer: D

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

17) Which of the following is characteristic of continental-continental convergent plate boundaries?

- A) Hot spots
- B) Uplifted mountain ranges
- C) Mid-ocean ridges
- D) Volcanic island arcs
- E) Fracture zones

Answer: B

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

18) The San Andreas Fault _____.

- A) is a continental transform fault
- B) is an oceanic transform fault
- C) is associated with deep focus earthquakes
- D) is located in the Juan de Fuca Plate
- E) is associated with volcanic activity

Answer: A

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

19) The Hawaiian Islands are located where the Pacific plate is _____.

- A) being subducted beneath the North American plate
- B) being subducted beneath Japan
- C) being thrust over the North American plate
- D) being thrust under Japan
- E) moving over a hot spot or mantle plume

Answer: E

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.4 Testing the Model: What Are Some Applications of Plate Tectonics?

Essent'l Concept: 2.4 Show how plate tectonics can be used as a working model

20) Large volcanoes on the seafloor that are cone-shaped on top because they never reached sea level are called _____.

- A) hotspots
- B) tablemounts
- C) seamounts
- D) guyots
- E) mantle plumes

Answer: C

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.4 Testing the Model: What Are Some Applications of Plate Tectonics?

Essent'l Concept: 2.4 Show how plate tectonics can be used as a working model

21) Volcanoes on the seafloor that are flat-topped because of wave erosion are called _____.

- A) hotspots
- B) tablemounts
- C) seamounts
- D) abyssal hills
- E) mantle plumes

Answer: B

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.4 Testing the Model: What Are Some Applications of Plate Tectonics?

Essent'l Concept: 2.4 Show how plate tectonics can be used as a working model

22) Coral reefs _____.

- A) are most common in deep and cold sub-tropical basins
- B) can be found at latitudes above 60°
- C) form when underwater volcanoes are thrust upward during a tectonic event
- D) include atolls, barrier, and fringing reefs
- E) were first described by Christopher Columbus during his voyage to Hispaniola

Answer: D

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.4 Testing the Model: What Are Some Applications of Plate Tectonics?

Essent'l Concept: 2.4 Show how plate tectonics can be used as a working model

23) The first scientist to propose the origin of coral reefs based upon subsidence (sinking) of volcanic islands was _____.

- A) Harry Hess
- B) Charles Darwin
- C) Alfred Wegener
- D) Drummond Matthews
- E) John Tuzo Wilson

Answer: B

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.4 Testing the Model: What Are Some Applications of Plate Tectonics?

Essent'l Concept: 2.4 Show how plate tectonics can be used as a working model

24) Coral reefs that initially develop along the margin of an island or continent where environmental conditions are suitable are called _____.

- A) fringing reefs
- B) barrier reefs
- C) atolls
- D) patch reefs
- E) basaltic reefs

Answer: A

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.4 Testing the Model: What Are Some Applications of Plate Tectonics?

Essent'l Concept: 2.4 Show how plate tectonics can be used as a working model

25) The study of historical changes of continental shapes and positions is called _____.

- A) paleomagnetism
- B) paleoclimatology
- C) sedimentology
- D) paleogeography

Answer: D

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.5 How Has Earth Changed in the Past, and How Will It Look in the Future?

Essent'l Concept: 2.5 Describe how Earth has changed in the past and predict how it will look in the future

26) Examine the five words and/or phrases and determine the relationship among the majority of words/phrases. Choose the one option that does not fit the pattern.

- A) Alfred Wegener
- B) Harry Hess
- C) Drummond Matthews
- D) Frederick Vine
- E) Stanley Miller

Answer: E

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

27) Examine the five words and/or phrases and determine the relationship among the majority of words/phrases. Choose the one option that does not fit the pattern.

- A) Gondwanaland
- B) Panamerica
- C) Pangaea
- D) Panthalassia
- E) Tethys Sea

Answer: B

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

28) Examine the five words and/or phrases and determine the relationship among the majority of words/phrases. Choose the one option that does not fit the pattern.

- A) Ice age
- B) Paleomagnetism
- C) Seafloor spreading
- D) Age of the ocean floor
- E) Distribution of earthquakes

Answer: A

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

29) Examine the five words and/or phrases and determine the relationship among the majority of words/phrases. Choose the one option that does not fit the pattern.

- A) Divergent plate boundary
- B) Oceanic-continental convergence
- C) Oceanic-oceanic convergence
- D) Transform plate boundary
- E) Hot spot

Answer: E

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

30) Examine the five words and/or phrases and determine the relationship among the majority of words/phrases. Choose the one option that does not fit the pattern.

- A) Rift valley
- B) Oceanic trench
- C) Rifting
- D) Seafloor spreading
- E) Divergent plate boundary

Answer: B

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

31) Examine the five words and/or phrases and determine the relationship among the majority of words/phrases. Choose the one option that does not fit the pattern.

- A) Hydrothermal vents
- B) Island arc
- C) Mountains
- D) Oceanic trench
- E) Volcanoes

Answer: A

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

32) Examine the five words and/or phrases and determine the relationship among the majority of words/phrases. Choose the one option that does not fit the pattern.

- A) Convergent plate boundary
- B) Volcanic arc
- C) Island arc
- D) Rift valley
- E) Continental arc

Answer: D

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

33) Examine the five words and/or phrases and determine the relationship among the majority of words/phrases. Choose the one option that does not fit the pattern.

- A) Transform fault
- B) San Andreas Fault
- C) Oceanic transform fault
- D) North Anatolian Fault
- E) Mariana Trench

Answer: E

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

34) Examine the five words and/or phrases and determine the relationship among the majority of words/phrases. Choose the one option that does not fit the pattern.

- A) Aleutian Islands
- B) Andes Mountains
- C) Hawaiian Islands
- D) Japan
- E) Mariana Trench

Answer: C

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

35) Examine the five words and/or phrases and determine the relationship among the majority of words/phrases. Choose the one option that does not fit the pattern.

- A) Aleutian Islands
- B) Canary Islands
- C) Galapagos Islands
- D) Azores
- E) Iceland

Answer: A

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.4 Testing the Model: What Are Some Applications of Plate Tectonics?

Essent'l Concept: 2.4 Show how plate tectonics can be used as a working model

36) Alfred Wegener's continental drift hypothesis received much hostile criticism and ridicule from the scientific community because of which of the following?

- A) His correlation of fossils was false; they were different species.
- B) The mechanism he proposed for the movement of the continents.
- C) There is no evidence of past glacial activity in areas that are now tropical.
- D) There was no correlation of rocks found in adjacent positions on matching continents

Answer: B

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

37) Which of the following fossils was used as data to help reconstruct Pangea because it was a reptile found in South America and Africa?

- A) Lepidodendron
- B) Archaeopteris
- C) Glossopteris
- D) Mesosaurus

Answer: D

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

38) Harry Hess suggested which of the following?

- A) Guyots formed at deep depths and migrated to shallow water.
- B) The continents plowed through oceanic lithosphere on their own power.
- C) The oceans are much older than the continents.
- D) The volcanic mid-ocean ridges were formed due to sea floor spreading.

Answer: D

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

39) Tectonic plates move about as fast as _____.

- A) a child crawls
- B) a river flows
- C) a snail crawls
- D) grass grows in the summer
- E) your fingernails grow

Answer: E

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

40) Which of the following rocks is the most reliable one used to collect information about Earth's magnetic field where and when the rock originated?

- A) Basalt
- B) Granite
- C) Limestone
- D) Sandstone
- E) Schist

Answer: A

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

41) Which of the following is the most convincing piece of evidence set forth to support the concept of sea floor spreading?

- A) The correlation of rocks found in adjacent positions on matching continents.
- B) The mid-ocean ridge is entirely volcanic in origin.
- C) The mid-ocean ridge rises more than 2.5 kilometers above the surrounding deep-ocean floor.
- D) The oceanic pattern of alternating reversals of Earth's magnetic field.

Answer: D

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

42) The sea floor of which of the following oceans has the simplest and most symmetric pattern of age distribution?

- A) The Arctic Ocean
- B) The Atlantic Ocean
- C) The Indian Ocean
- D) The Pacific Ocean
- E) The Southern Ocean

Answer: B

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

43) Based on the Theory of Plate Tectonics, you would expect to find _____ heat flow at the mid-ocean ridge and _____ heat flow at subduction zones when compared to other parts of the crust.

- A) decreased; decreased
- B) decreased; increased
- C) increased; decreased
- D) increased; increased

Answer: C

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

44) Most large earthquakes occur along which of the following?

- A) Faults on land
- B) Mid-ocean ridges
- C) Ocean trenches
- D) Other faults in the sea floor

Answer: C

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

45) The tectonic forces called slab pull and slab suction may act in unison at which type of plate boundary?

- A) Convergent
- B) Divergent
- C) Intraplate
- D) Transform

Answer: A

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

46) Which of the following is an example of an oceanic-oceanic divergent plate boundary?

- A) Aleutian Islands
- B) East Pacific Rise
- C) Mendocino Fault
- D) Red Sea
- E) San Andreas Fault

Answer: B

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

47) Which of the following is an example of a continental-continental divergent plate boundary?

- A) Andes Mountains
- B) Himalaya Mountains
- C) Mendocino Fault
- D) Red Sea
- E) San Andreas Fault

Answer: D

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

48) Which of the following is an example of an oceanic-oceanic convergent plate boundary?

- A) Aleutian Islands
- B) East Pacific Rise
- C) Mendocino Fault
- D) Red Sea
- E) San Andreas Fault

Answer: A

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

49) Which of the following is an example of an oceanic-continental convergent plate boundary?

- A) Aleutian Islands
- B) Andes Mountains
- C) Himalaya Mountains
- D) Mendocino Fault
- E) San Andreas Fault

Answer: B

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

50) Which of the following is an example of a continental-continental convergent plate boundary?

- A) Aleutian Islands
- B) Andes Mountains
- C) Himalaya Mountains
- D) Mendocino Fault
- E) San Andreas Fault

Answer: C

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

51) Which of the following is an example of an oceanic transform plate boundary?

- A) Aleutian Islands
- B) East Pacific Rise
- C) Mendocino Fault
- D) Red Sea
- E) San Andreas Fault

Answer: C

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

52) Which of the following is an example of a continental transform plate boundary?

- A) Aleutian Islands
- B) Andes Mountains
- C) Himalaya Mountains
- D) Mendocino Fault
- E) San Andreas Fault

Answer: E

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

53) The Mid-Atlantic Ridge is an example of _____ plate boundary.

- A) a continental-continental divergent
- B) an oceanic transform
- C) an oceanic-continental convergent
- D) an oceanic-oceanic convergent
- E) an oceanic-oceanic divergent

Answer: E

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

54) The East Pacific Rise is an example of _____ plate boundary.

- A) a continental-continental divergent
- B) an oceanic transform
- C) an oceanic-continental convergent
- D) an oceanic-oceanic convergent
- E) an oceanic-oceanic divergent

Answer: E

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

55) The East Africa Rift Valleys are an example of _____ plate boundary.

- A) a continental transform
- B) a continental-continental convergent
- C) a continental-continental divergent
- D) an oceanic-continental convergent
- E) an oceanic-oceanic divergent

Answer: C

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

56) The Red Sea is an example of _____ plate boundary.

- A) a continental-continental convergent
- B) a continental-continental divergent
- C) an oceanic-continental convergent
- D) an oceanic-oceanic convergent
- E) an oceanic-oceanic divergent

Answer: B

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

57) The Gulf of California is an example of _____ plate boundary.

- A) a continental-continental convergent
- B) a continental-continental divergent
- C) an oceanic-continental convergent
- D) an oceanic-oceanic convergent
- E) an oceanic-oceanic divergent

Answer: B

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

58) The Peru Chile Trench is an example of _____ plate boundary.

- A) a continental-continental convergent
- B) a continental-continental divergent
- C) an oceanic-continental convergent
- D) an oceanic-oceanic convergent
- E) an oceanic-oceanic divergent

Answer: C

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

59) The Andes Mountains are an example of _____ plate boundary.

- A) a continental transform
- B) a continental-continental convergent
- C) a continental-continental divergent
- D) an oceanic-continental convergent
- E) an oceanic-oceanic convergent

Answer: D

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

60) The Mariana Trench is an example of _____ plate boundary.

- A) a continental transform
- B) an oceanic transform
- C) an oceanic-continental convergent
- D) an oceanic-oceanic convergent
- E) an oceanic-oceanic divergent

Answer: D

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

61) The Aleutian Islands are an example of _____ plate boundary.

- A) a continental-continental convergent
- B) an oceanic transform
- C) an oceanic-continental convergent
- D) an oceanic-oceanic convergent
- E) an oceanic-oceanic divergent

Answer: D

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

62) The Himalaya Mountains are an example of _____ plate boundary.

- A) a continental transform
- B) a continental-continental convergent
- C) a continental-continental divergent
- D) an oceanic-continental convergent
- E) an oceanic-oceanic convergent

Answer: B

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

63) The Alps are an example of _____ plate boundary.

- A) a continental transform
- B) a continental-continental convergent
- C) a continental-continental divergent
- D) an oceanic-continental convergent
- E) an oceanic-oceanic convergent

Answer: B

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

64) The Mendocino Fault is an example of _____ plate boundary.

- A) a continental transform
- B) a continental-continental convergent
- C) an oceanic transform
- D) an oceanic-continental convergent
- E) an oceanic-oceanic convergent

Answer: C

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

65) The Eltanin Fault is an example of _____ plate boundary.

- A) a continental transform
- B) a continental-continental convergent
- C) an oceanic transform
- D) an oceanic-continental convergent
- E) an oceanic-oceanic convergent

Answer: C

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

66) The San Andreas Fault is an example of _____ plate boundary.

- A) a continental transform
- B) a continental-continental convergent
- C) an oceanic transform
- D) an oceanic-continental convergent
- E) an oceanic-oceanic convergent

Answer: A

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

67) The Alpine Fault of New Zealand is an example of _____ plate boundary.

- A) a continental transform
- B) a continental-continental convergent
- C) a continental-continental divergent
- D) an oceanic-continental convergent
- E) an oceanic-oceanic convergent

Answer: A

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

68) The gently sloping and fast-spreading parts of the mid-ocean ridge are called _____.

- A) guyots
- B) nemataths
- C) oceanic ridges
- D) oceanic rises
- E) volcanic arcs

Answer: D

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

69) The steeply-sloping and slower-spreading parts of the mid-ocean ridge are called _____.

- A) guyots
- B) nemataths
- C) oceanic ridges
- D) oceanic rises
- E) ultra-slow spreading centers

Answer: C

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

70) Earth's mantle is exposed on the ocean floor in great slabs of rock between widely-spaced volcanoes in _____.

- A) deep-ocean trenches
- B) oceanic ridges
- C) oceanic rises
- D) ultra-slow spreading centers
- E) volcanic arcs

Answer: D

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

71) To find the largest area of the ocean with the oldest ocean crust, you should go to the _____.

- A) eastern Pacific
- B) northern Atlantic
- C) southern Ocean near Australia
- D) western Pacific

Answer: D

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

72) Chains of extinct volcanoes that are progressively older as one travels away from a hotspot are called _____.

- A) nemataths
- B) oceanic ridges
- C) oceanic rises
- D) ultra-slow spreading centers
- E) volcanic arcs

Answer: A

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.4 Testing the Model: What Are Some Applications of Plate Tectonics?

Essent'l Concept: 2.4 Show how plate tectonics can be used as a working model

73) Underwater volcanic peaks that resemble volcanoes on land except that they are flat on top are called _____.

- A) guyots
- B) oceanic ridges
- C) oceanic rises
- D) ultra-slow spreading centers
- E) volcanic arcs

Answer: A

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.4 Testing the Model: What Are Some Applications of Plate Tectonics?

Essent'l Concept: 2.4 Show how plate tectonics can be used as a working model

74) The Himalaya Mountains are an example of the _____ stage of the Wilson Cycle.

- A) declining
- B) juvenile
- C) mature
- D) suturing
- E) terminal

Answer: D

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.5 How Has Earth Changed in the Past, and How Will It Look in the Future?

Essent'l Concept: 2.5 Describe how Earth has changed in the past and predict how it will look in the future

75) Plate convergence begins during which stage of the Wilson Cycle?

- A) Declining
- B) Juvenile
- C) Mature
- D) Suturing
- E) Terminal

Answer: A

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.5 How Has Earth Changed in the Past, and How Will It Look in the Future?

Essent'l Concept: 2.5 Describe how Earth has changed in the past and predict how it will look in the future

76) Which of the following is an example of the embryonic stage of the Wilson Cycle?

- A) Atlantic Ocean
- B) East Africa
- C) Mediterranean Sea
- D) Pacific Ocean
- E) Red Sea

Answer: B

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.5 How Has Earth Changed in the Past, and How Will It Look in the Future?

Essent'l Concept: 2.5 Describe how Earth has changed in the past and predict how it will look in the future

77) The Pacific Ocean is an example of the _____ stage of the Wilson Cycle.

- A) declining
- B) juvenile
- C) mature
- D) suturing
- E) terminal

Answer: A

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.5 How Has Earth Changed in the Past, and How Will It Look in the Future?

Essent'l Concept: 2.5 Describe how Earth has changed in the past and predict how it will look in the future

78) Ocean basins with continental margins are representative of the _____ stage of the Wilson Cycle.

- A) declining
- B) juvenile
- C) mature
- D) suturing
- E) terminal

Answer: C

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.5 How Has Earth Changed in the Past, and How Will It Look in the Future?

Essent'l Concept: 2.5 Describe how Earth has changed in the past and predict how it will look in the future

79) Judge the following sentence according to the criteria given below: The next reversal of Earth's magnetic poles is thought to be overdue BECAUSE the last major reversal occurred 780,000 years ago.

- A) The assertion and the reason are both correct, and the reason is valid.
- B) The assertion and the reason are both correct, but the reason is invalid.
- C) The assertion is correct, but the reason is incorrect.
- D) The assertion is incorrect, but the reason is correct.
- E) Both the assertion and the reason are incorrect.

Answer: A

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

80) Judge the following sentence according to the criteria given below: The rate of sea floor spreading appears to be greatest in the Pacific Ocean BECAUSE the radiometric age bands in the Pacific Ocean are narrower than those found in the Atlantic and Indian Oceans.

- A) The assertion and the reason are both correct, and the reason is valid.
- B) The assertion and the reason are both correct, but the reason is invalid.
- C) The assertion is correct, but the reason is incorrect.
- D) The assertion is incorrect, but the reason is correct.
- E) Both the assertion and the reason are incorrect.

Answer: C

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

81) Judge the following sentence according to the criteria given below: Seismologists prefer the well-known Richter scale over the moment magnitude scale BECAUSE the Richter scale is better for larger-magnitude earthquakes.

- A) The assertion and the reason are both correct, and the reason is valid.
- B) The assertion and the reason are both correct, but the reason is invalid.
- C) The assertion is correct, but the reason is incorrect.
- D) The assertion is incorrect, but the reason is correct.
- E) Both the assertion and the reason are incorrect.

Answer: E

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

82) Judge the following sentence according to the criteria given below: Andesitic volcanic eruptions are usually less explosive and destructive than basaltic eruptions BECAUSE andesite magma is more viscous than basalt magma and contains a higher gas content.

- A) The assertion and the reason are both correct, and the reason is valid.
- B) The assertion and the reason are both correct, but the reason is invalid.
- C) The assertion is correct but the reason is incorrect.
- D) The assertion is incorrect but the reason is correct.
- E) Both the assertion and the reason are incorrect.

Answer: D

Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

2.3 Essay Questions

1) What are the lines of evidence that Alfred Wegener used to support the idea of continental drift? Why did scientists of his day doubt that continents drifted?

Answer: Alfred Wegener was the first scientist to advance the idea of mobile continents in 1912. Wegener proposed that the continents slowly drift across Earth's surface. Although this idea was not new, the development of better maps by the early 1900s suggested to Wegener that the shapes of matching shorelines on different continents suggested that the continents moved or drifted over geologic time. Several lines of evidence supported the idea of continental drift, namely: matching sequences of rocks and mountain chains; glacial ages and other climate evidence; and the distribution of organisms, including extant organisms and fossilized remains. The main objection from the scientific community centered on the mechanism that Wegener proposed for the movement of continents: gravitational attraction and tidal forces.

Diff: 2

Bloom's Taxonomy: Remembering/Understanding

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

2) Briefly discuss four important lines of evidence that support the hypothesis of continental drift.

Answer: **Fit of the Continents:** Wegener suggested that during the geologic past, the continents collided to form a large landmass, which he named Pangaea. Wegener's evidence indicated that as Pangaea began to split apart, the various continental masses started to drift toward their present geographic positions.

Matching sequences of rocks and mountain chains: If the continents were once together, as Wegener had hypothesized, then evidence should appear in rock sequences that were originally continuous but are now separated by large distances. Many rock sequences from one continent were identical to rock sequences on an adjacent continent—although the two were separated by an ocean. In addition, mountain ranges that terminated abruptly at the edge of a continent continued on another continent across an ocean basin, with identical rock sequences, ages, and structural styles. For example, similar rocks from the Appalachian Mountains in North America match up with identical rocks from the British Isles and the Caledonian Mountains in Europe.

Glacial ages and other climate evidence: Wegener also noticed the occurrence of past glacial activity in areas that are now tropical and suggested that it, too, provided supporting evidence for drifting continents. Currently, the only places in the world where thick continental ice sheets occur are in the polar regions of Greenland and Antarctica. However, evidence of ancient glaciation is found in the lower-latitude regions of South America, Africa, India, and Australia.

Distribution of organisms: To add credibility to his argument for the existence of the supercontinent of Pangaea, Wegener cited documented cases of several fossil organisms found on different landmasses that could not have crossed the vast oceans presently separating the continents. For example, the fossil remains of Mesosaurus, an extinct, presumably aquatic reptile that lived about 250 million years ago, are located only in eastern South America and western Africa.

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.1 What Evidence Supports Continental Drift?

Essent'l Concept: 2.1 Evaluate the evidence that supports continental drift

3) Discuss changes in the lithosphere that occur between an oceanic ridge and an oceanic trench.
Answer: The mid-ocean ridge is a continuous underwater mountain range that winds through every ocean basin in the world. It is entirely volcanic in origin, wraps one-and-a-half times around the globe, and rises more than 2.5 kilometers (1.5 miles) above the surrounding deep-ocean floor. New ocean floor forms at the crest, or axis, of the mid-ocean ridge. By the process of sea floor spreading, new ocean floor is split in two and carried away from the axis, replaced by the upwelling of volcanic material that fills the void with new strips of sea floor. Sea floor spreading occurs along the axis of the mid-ocean ridge, which is referred to as a spreading center. At the same time, ocean floor is being destroyed at deep ocean trenches. Trenches are the deepest parts of the ocean floor and, on a map of the sea floor, resemble a narrow crease or trough. The largest earthquakes in the world occur near these trenches; they are caused by a plate bending downward and slowly plunging back into Earth's interior. This process is called subduction, and the sloping area from the trench along the downward-moving plate is called a subduction zone.

Diff: 2

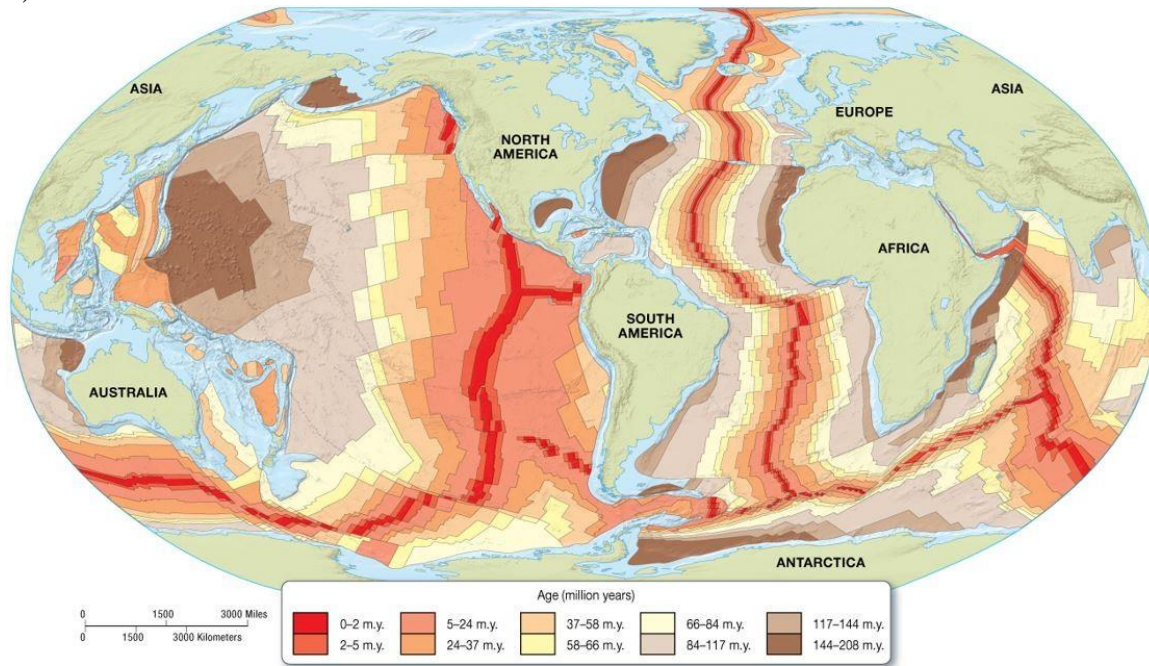
Bloom's Taxonomy: Remembering/Understanding

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

2.4 Visual Questions

1)



How is the age of the ocean sediments related to the distance from a mid-ocean ridge?

Answer: Since mid-ocean ridges are divergent plate boundaries where new crust is formed as the plates separate, the newest crust is at the spreading center in the mid-ocean ridge (ridge axis) and as one moves away from the ridge axis toward the continent, the age of the ocean sediments increases.

Diff: 2

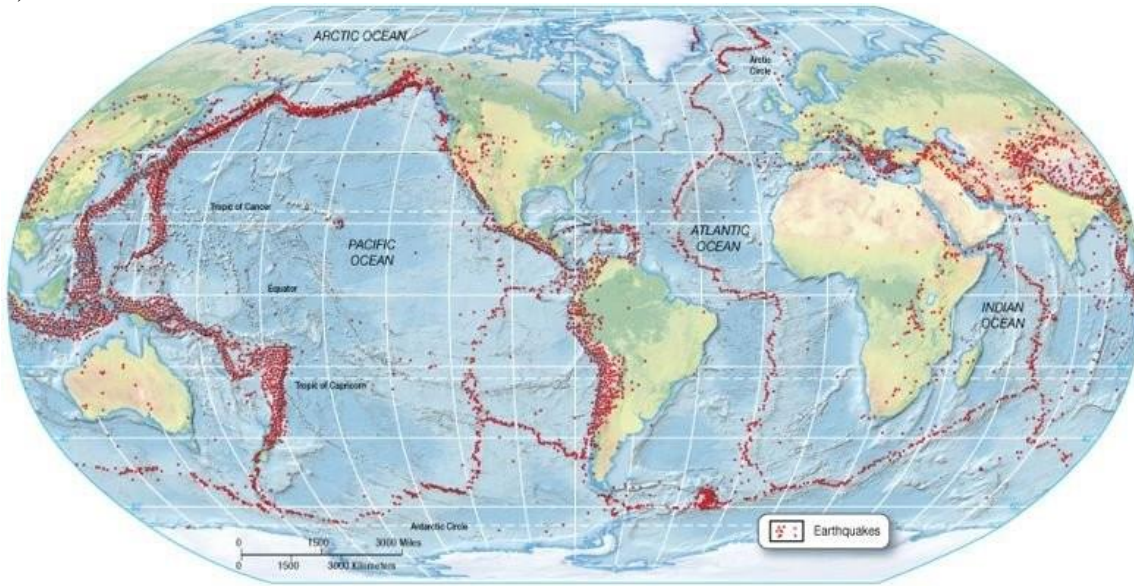
Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

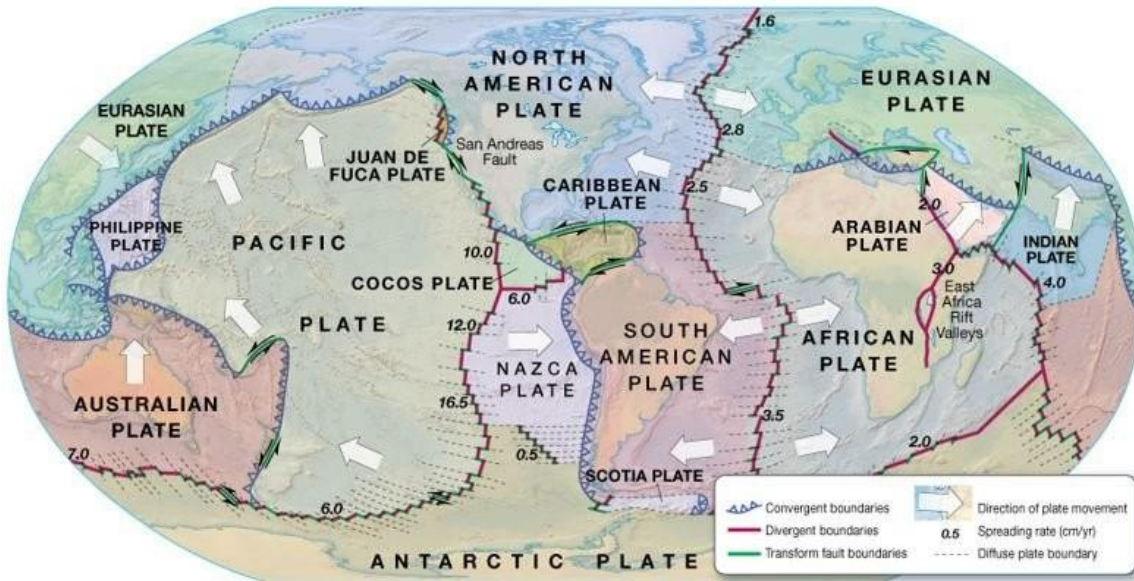
Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

2)



(a) Distribution of earthquakes with magnitude equal to or greater than $M_w = 5.0$ for the period 1980–1990.



(b) Plate boundaries define the major tectonic plates (shaded), with arrows indicating the direction of motion and numbers representing the rate of motion in centimeters per year.

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Why does a map of worldwide earthquakes closely match the locations of worldwide plate boundaries?

Answer: Earthquakes are sudden releases of energy usually caused by the movement of lithospheric plates or volcanic eruptions. The global distribution of earthquakes indicates that most occur along oceanic trenches, reflecting the energy released during the process of subduction. Other earthquakes occur along divergent plate boundaries at seafloor spreading centers along the global oceanic ridge system. Comparison of earthquake activity with the boundaries of plates indicates a high degree of correspondence.

Diff: 3

Bloom's Taxonomy: Applying/Analyzing

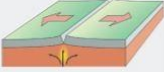
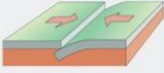
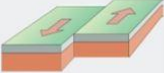
Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

3)

SMARTTABLE 2.1 CHARACTERISTICS, TECTONIC PROCESSES, FEATURES, AND EXAMPLES OF PLATE BOUNDARIES

Plate boundary	Plate movement	Crust types	Sea floor created or destroyed?	Tectonic process	Sea floor feature(s)	Geographic examples
Divergent plate boundaries		Oceanic–oceanic	New sea floor is created	Sea floor spreading	Mid-ocean ridge; volcanoes; young lava flows	Mid-Atlantic Ridge, East Pacific Rise
		Continental–continental	As a continent splits apart, new sea floor is created	Continental rifting	Rift valley; volcanoes; young lava flows	East Africa Rift Valleys, Red Sea, Gulf of California
Convergent plate boundaries		Oceanic–continental	Old sea floor is destroyed	Subduction	Trench; volcanic arc on land	Peru–Chile Trench, Andes Mountains
		Oceanic–oceanic	Old sea floor is destroyed	Subduction	Trench; volcanic arc as islands	Mariana Trench, Aleutian Islands
		Continental–continental	N/A	Collision	Tall mountains	Himalaya Mountains, Alps
Transform plate boundaries		Oceanic	N/A	Transform faulting	Fault	Mendocino Fault, Eitanin Fault (between mid-ocean ridges)
		Continental	N/A	Transform faulting	Fault	San Andreas Fault, Alpine Fault (New Zealand)

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How are **convergent** and **divergent** plate boundaries related to **constructive** and **destructive** plate margins?

Answer: The terms convergent and divergent refer to the direction of plate movements relative to each other. Convergent plates are moving toward one another whereas divergent plate boundaries are moving apart. Constructive and destructive plate margins refer to the fate of the rock at the plate boundary. At constructive plate margins, new crust is being formed while at destructive plate boundaries, crust is being destroyed (usually by melting). Convergent plate boundaries are also destructive plate boundaries because when two plates collide, one plate is forced below the other (subduction) and the subducted plate crust melts. Similarly, when two plates diverge, magma rises to the surface at rift valleys (in mid-ocean ridges) forming new crust.

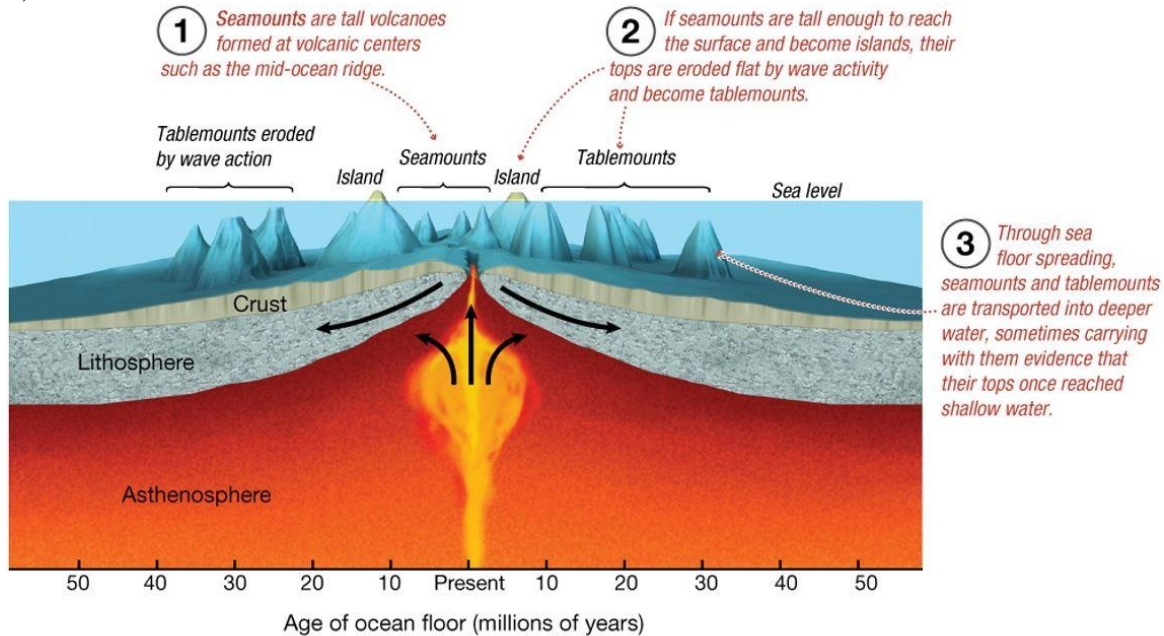
Diff: 4

Bloom's Taxonomy: Applying/Analyzing

Section: 2.3 What Features Occur at Plate Boundaries?

Essent'l Concept: 2.3 Discuss the origin and characteristics of features that occur at plate boundaries

4)



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How can plate tectonics be used to help explain the differences between a seamount and a tablemount?

Answer: Tall volcanic peaks on the ocean floor resemble many volcanoes on land and can either be abyssal hills, seamounts, or tablemounts (guyots). Seamounts are cone-shaped on top, while tablemounts are flat on top. Until the theory of plate tectonics was developed, it was difficult for scientists to understand how these differences could have been produced. The origin of many seamounts and tablemounts is related to volcanic activity occurring at hotspots where mantle plumes are close to the seafloor surface. Some volcanoes may be built so high that they rise above sea level and become islands, upon which they can become flattened due to wind and wave erosion. Other volcanoes, known as seamounts, never reach the ocean surface due to plate movement over a hotspot and thus remain pointed.

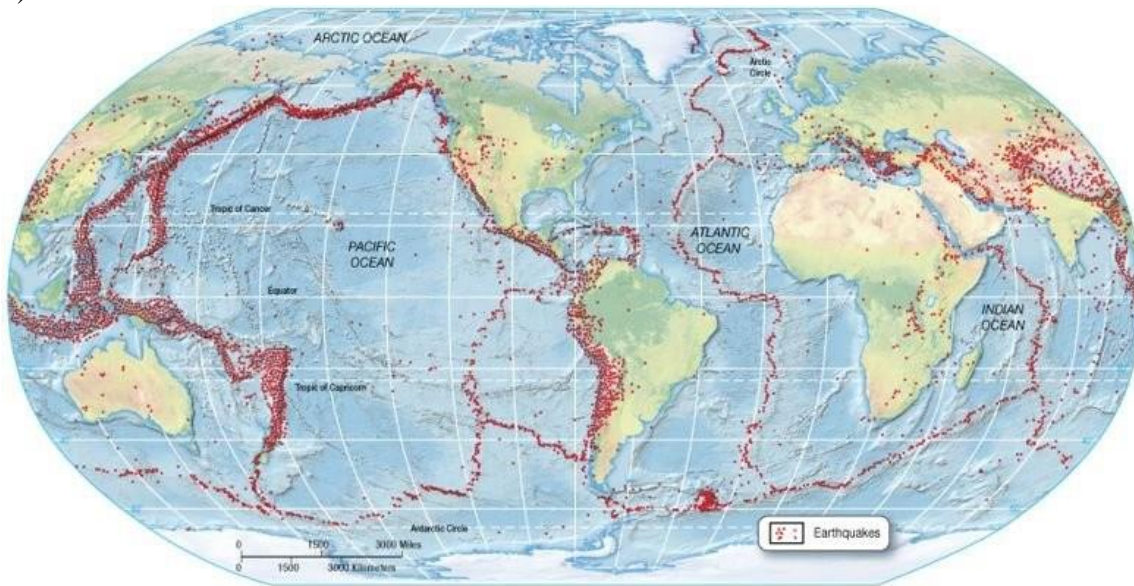
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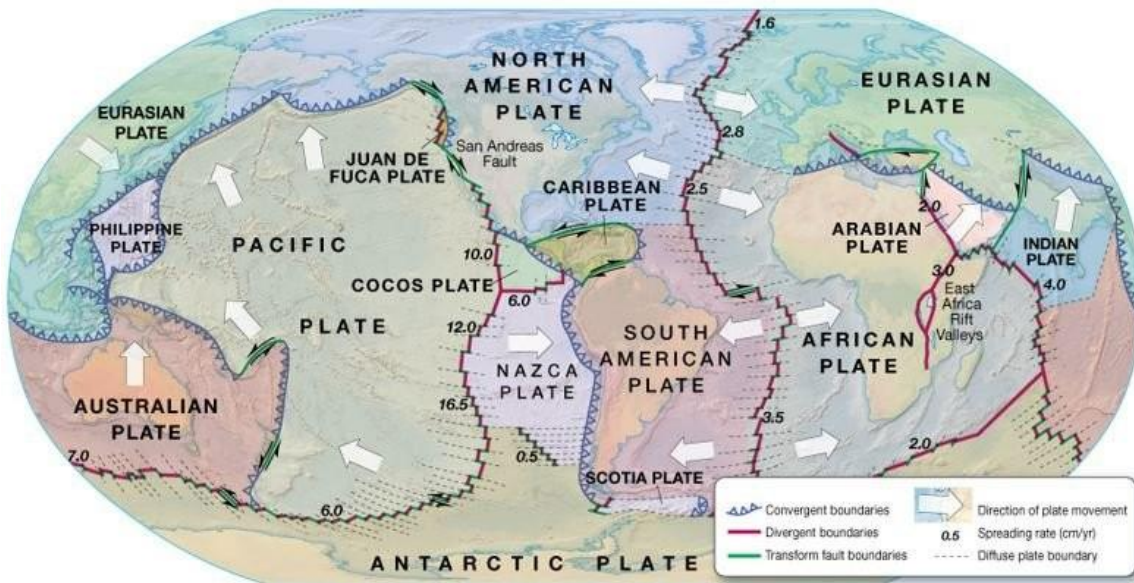
Section: 2.4 Testing the Model: What Are Some Applications of Plate Tectonics?

Essent'l Concept: 2.4 Show how plate tectonics can be used as a working model

5)



(a) Distribution of earthquakes with magnitude equal to or greater than $M_w = 5.0$ for the period 1980–1990.



(b) Plate boundaries define the major tectonic plates (shaded), with arrows indicating the direction of motion and numbers representing the rate of motion in centimeters per year.

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How has seismic activity been used in our understanding of plate boundaries?

Answer: The distribution of earthquake epicenters is not random. They occur in linear features that coincide with the plate boundaries.

Diff: 4

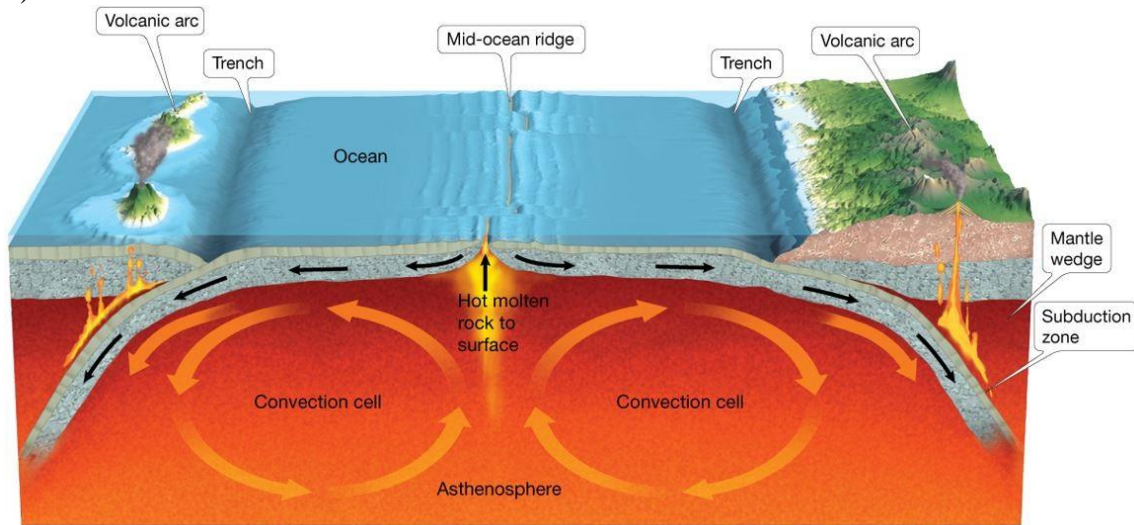
Bloom's Taxonomy: Applying/Analyzing

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

6)



How does convection in the asthenosphere explain ocean basin features, heat flow, and the thickness of the lithosphere?

Answer: Hot, upwelling mantle results in a bathymetric high at divergent plate boundaries and a deep-ocean trench at convergent plate boundaries. There is high heat flow at divergent plate boundaries and low heat flow at convergent plate boundaries. Earth's lithosphere is thinnest at a mid-ocean ridge and thickens as it cools.

Diff: 3

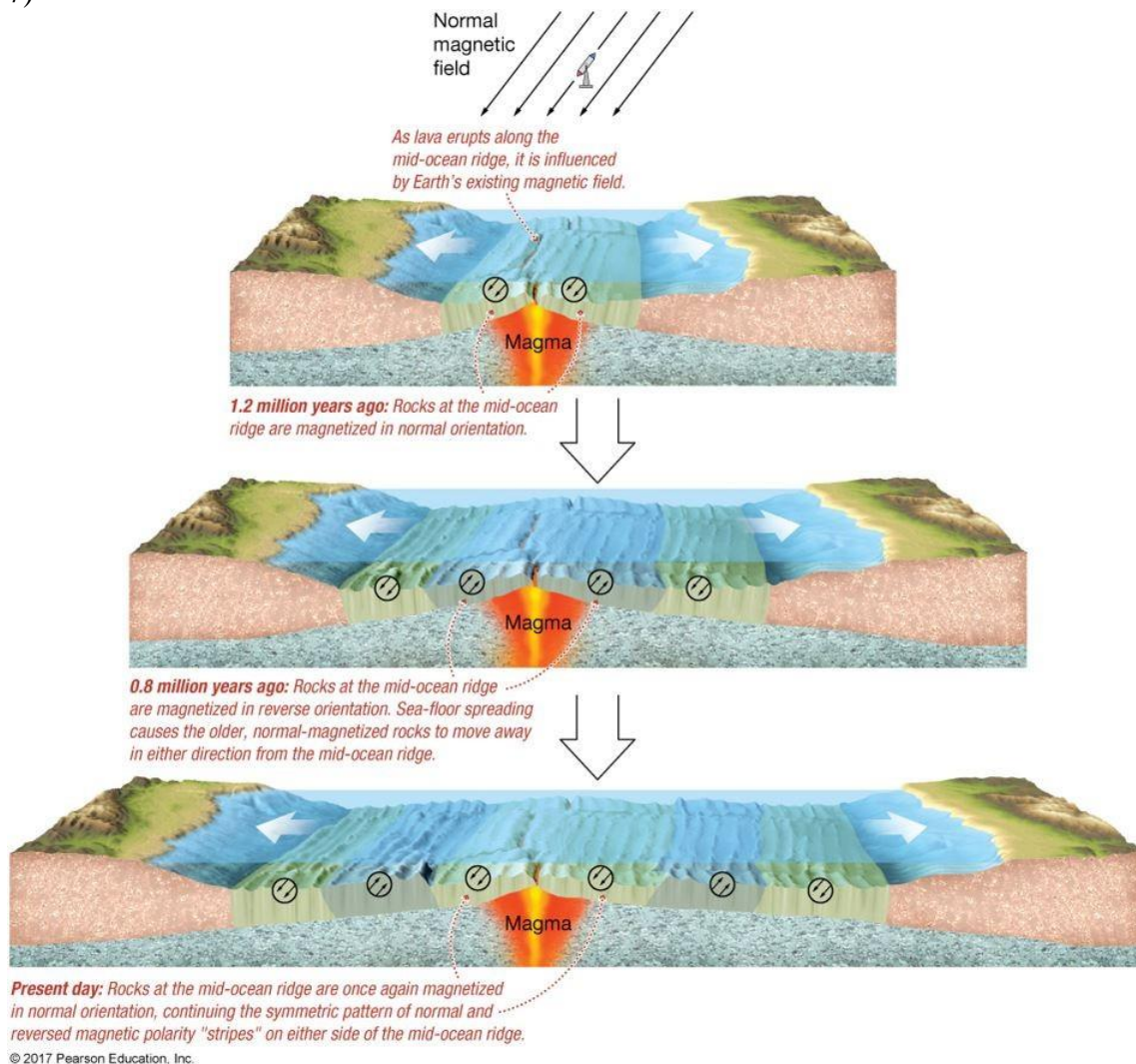
Bloom's Taxonomy: Applying/Analyzing

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7

7)



Describe the formation of the magnetic patterns in rocks on the seafloor.

Answer: The pattern of above-average and below-average magnetic polarity episodes embedded in sea floor rocks is caused by Earth's magnetic field alternating between "normal" polarity and "reversed" polarity. This pattern is created when newly formed rocks at the mid-ocean ridge are magnetized with whichever polarity exists on Earth during their formation. As those rocks move away from the crest of the mid-ocean ridge, they maintain their original polarity, and subsequent rocks record the periodic switches of Earth's magnetic polarity. The result is an alternating pattern of magnetic polarity anomaly stripes that are symmetric with respect to the mid-ocean ridge.

Diff: 1

Bloom's Taxonomy: Remembering/Understanding

Section: 2.2 What Evidence Supports Plate Tectonics?

Essent'l Concept: 2.2 Summarize the evidence that supports plate tectonics

Global Sci Out: 7