

Chapter 8: Plate Tectonics -- Multi-format Test

Modified True/False

Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

- _____ 1. The huge landmass composed of earlier forms of today's continents was named *Pangaea* by Wegener.

- _____ 2. Continental plates are composed of *basalt*, and are thicker and less dense than oceanic plates.

- _____ 3. Long chains of undersea *mountains* are called mid-ocean ridges. _____
- _____ 4. The boundary where two lithospheric plates are moving apart from each other is referred to as a *divergent* plate boundary. _____
- _____ 5. Old crust is consumed into the mantle at a *transform* plate boundary. _____
- _____ 6. Scientists have used *volcanoes* to help locate transform plate boundaries. _____

Completion

Complete each statement.

Select the correct term to complete each sentence. There are extra terms in the list.

| | | |
|------------------|------------|-------------------|
| divergent | convergent | subduction |
| conduction | convection | continental drift |
| mid-ocean ridges | Pangaea | continental |
| ocean trench | oceanic | divergent |

7. Alfred Wegener was the German scientist who formed the theory of _____.
8. The ancient supercontinent that existed about 250 million years ago is called _____.
9. The sinking of one lithospheric plate under another is known as _____.
10. _____ plates are thin, dense and composed of basalt.
11. _____ are long chains of undersea mountain ranges.
12. _____ boundaries are located where two plates are colliding into each other.

Short Answer

13. List **three pieces of evidence** that Wegener used to support his idea of continental drift.
14. **Describe** the idea of continental drift. Use the word **Pangaea** in your answer.
15. Explain how mid-ocean ridges and sea-floor spreading are related. What is the importance of sea-floor spreading?
16. What are the two types of lithospheric plates on Earth? List 3 differences between the two.

17. List three ways in which the theory of plate tectonics explains the formation of major features of Earth's surface and important geologic events.
18. Explain what happens at a convergent boundary:
 - a. when two continents collide, and
 - b. when continental crust collides with oceanic crust.
19. Metamorphic rocks are typically formed at what type of plate boundary? List two things that need to happen in order for a metamorphic rock to form.

Problem

20. The fastest lithospheric plates move about 10 centimeters each year. How many years would it take these plates to move one kilometer?
21. The North American Plate is moving westward at approximately 2 centimeters each year. How many kilometers will the North American Plate move over the next 1 million years?

Essay

22. The Mid-Atlantic ridge is located in the middle of the Atlantic ocean. Along the eastern coasts of the Americas, as well as the west coasts of Europe and Africa, there are no deep-ocean trenches. Is the Atlantic Ocean shrinking, growing, or staying the same size? Explain your answer using your knowledge of plate tectonics.
23. The San Andreas Fault runs north to south through much of the western portion of California. Explain what type of plate boundary is located here, what two lithospheric plates meet here, how they are moving in relation to each other, and what geologic events frequently occur at this boundary.
24. What are the three types of plate boundaries? Explain the movement of tectonic plates at each of these plate boundaries.
25. The border of the Pacific Ocean is commonly referred to as the "Ring of Fire". Why do you think this it was given this name? Explain using your knowledge of plate tectonics.

Chapter 8: Plate Tectonics -- Multi-format Test Answer Section

MODIFIED TRUE/FALSE

1. ANS: T
REF: section 8.1
PTS: 1 DIF: basic
2. ANS: F, granite
PTS: 1 DIF: basic REF: section 8.2
3. ANS: T
REF: section 8.2
PTS: 1 DIF: intermediate
4. ANS: T
REF: section 8.3
PTS: 1 DIF: basic
5. ANS: F, convergent
PTS: 1 DIF: intermediate REF: section 8.3
6. ANS: F, earthquakes
PTS: 1 DIF: intermediate REF: section 8.3

COMPLETION

7. ANS: continental drift
PTS: 1 DIF: basic REF: section 8.1
8. ANS: Pangaea
PTS: 1 DIF: basic REF: section 8.1
9. ANS: subduction
PTS: 1 DIF: basic REF: section 8.2
10. ANS: Oceanic
PTS: 1 DIF: intermediate REF: section 8.2
11. ANS: Mid-ocean ridges
PTS: 1 DIF: intermediate REF: section 8.2
12. ANS: Convergent
PTS: 1 DIF: basic REF: section 8.3

SHORT ANSWER

13. ANS:

Answers may vary. Correct responses will include 3 of the following pieces of evidence:

1. Fossils of similar organisms are found on different continents.
2. Similar mountain ranges are found on different continents.
3. Matching coal beds found on different continents.
4. Evidence of an ancient, warm, dry climate in Antarctica, indicating that the continent of Antarctica was once found closer to the equator.

PTS: 1 DIF: basic REF: section 8.1

14. ANS:

Alfred Wegener was the scientist who put forth the idea of continental drift. This is the idea that the continents were at one time joined together in one supercontinent called Pangaea and have slowly drifted apart. The continents continue to drift today.

PTS: 1 DIF: intermediate REF: section 8.1

15. ANS:

The process of sea-floor spreading occurs at mid-ocean ridges. The sea floor slowly spreads away from the mid-ocean ridges, driven by convection currents in the mantle. Sea-floor spreading is the driving force that causes the continents to get pushed away from mid-ocean ridges.

PTS: 1 DIF: advanced REF: section 8.3

16. ANS:

The two types of lithospheric plates are oceanic and continental plates. Oceanic plates are thin, dense and made of basalt. Continental plates are thick, less dense, and composed of granite.

PTS: 1 DIF: intermediate REF: section 8.2

17. ANS:

Answers may vary. Correct answers include:

Plate tectonics has allowed a better understanding of why volcanoes are located where they are. It has also helped explain why earthquakes occur where they are. It also explains where important resources such as oil and gas can be found.

PTS: 1 DIF: intermediate REF: section 8.2

18. ANS:

- a. When two continents collide at a convergent boundary, mountain ranges are formed.
- b. When continental crust collides with oceanic crust at a convergent boundary, the oceanic crust subducts under the continent.

PTS: 1 DIF: advanced REF: section 8.3

19. ANS:

Metamorphic rocks are typically formed at convergent plate boundaries. Heat and pressure need to be applied to a pre-existing rock in order to change it into a metamorphic rock.

PTS: 1 DIF: intermediate REF: section 8.4

PROBLEM

20. ANS:

$$10 \text{ cm/yr} = 0.0001 \text{ km/yr}$$

$$\frac{1 \text{ km}}{0.0001 \text{ km/yr}} \div = 10,000 \text{ years}$$

PTS: 1 DIF: intermediate REF: section 8.2

21. ANS:

$$2 \text{ cm/yr} = 0.00002 \text{ km/yr}$$

$$0.00002 \text{ km} \times 1,000,000 \text{ yrs} = 20 \text{ km}$$

PTS: 1 DIF: intermediate REF: section 8.2

ESSAY

22. ANS:

The Atlantic Ocean has been growing in size and continues to grow larger. Sea-floor spreading is occurring at the Mid-Atlantic ridge, forming new crust in the Atlantic ocean, which causes it to grow larger. Because there are no trenches that subduct, the older ocean crust in the Atlantic ocean continues to grow larger as the old crust continues to get pushed farther away from the ridge.

PTS: 1 DIF: advanced REF: section 8.2

23. ANS:

The San Andreas Fault in California is a transform plate boundary where two plates are sliding past each other. One plate is the Pacific plate and the other plate is the North American Plate. Earthquakes frequently occur in this area.

PTS: 1 DIF: intermediate REF: section 8.3

24. ANS:

The three types of plate boundaries are convergent, divergent, and transform boundaries. At convergent boundaries, two plates collide into each other. At divergent boundaries, two plates are moving apart from each other. At transform boundaries, two plates are sliding against each other.

PTS: 1 DIF: intermediate REF: section 8.3

25. ANS:

The border of the Pacific Ocean is called the “Ring of Fire” because of the large number of volcanoes in the area. Trenches are located around much of the tectonic boundary between the Pacific Plate and the surrounding plates. As the Pacific plate subducts into the trenches, volcanic island chains form and volcanoes frequently erupt.

PTS: 1 DIF: advanced REF: section 8.3