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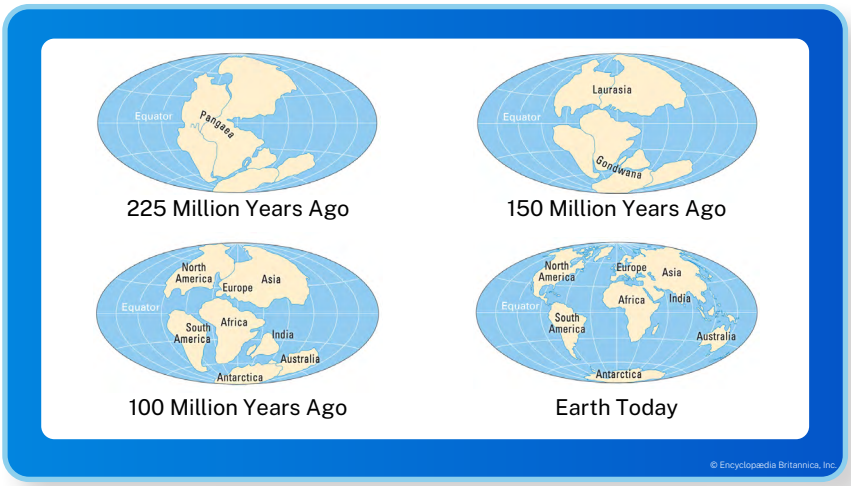
Name: **Date:**

Plate Tectonics

Instructions: Read the article and examine the image to answer the questions below.

In 1912, Alfred Wegener proposed the theory of continental drift. He suggested that hundreds of millions of years ago there was only a single large landmass, which Wegener called Pangea. Over time, this landmass separated and its pieces drifted apart.



Continental Drift Scientists have evidence that millions of years ago the continents all were part of one large landmass called Pangea.

Wegener pointed to the shapes of the continents as evidence for his theory. Continents, and the underwater extensions around them called continental shelves, seem to match up like jigsaw puzzle pieces in some places. Patterns of where fossils are found can provide evidence of where the continents themselves were at different points in Earth's history. Rock formations provide further evidence to support continental drift. For example, the Appalachian Mountains, found in North America, match the Caledonian Mountains, which cover eastern Greenland, the British Isles, and western Scandinavia, as well as the Atlas Mountains, which cover northwestern Africa. This discovery indicates that these mountain ranges formed in the same location and at the same time, and later separated as the continents drifted apart. Despite this evidence, it took many years before scientists fully accepted Wegener's continental drift theory. One reason for this is that Wegener's theory did not explain how a landmass as big as a continent could move.

Today we know that Earth's surface is broken up into pieces that are called tectonic plates. The theory of plate tectonics summarizes our modern understanding of Earth's plates and how they move. These plates move very slowly, and this movement is called plate tectonics. Technology allowed scientists to determine that Earth has layers, and the movement of matter and energy in Earth's layers drives plate movement. Advances in underwater imaging have led scientists to a trove of evidence that Earth's plates are in motion. Scientists also found a system of ridges circling Earth's surface underneath the oceans. Scientists have studied the ages of the rocks surrounding the ridges and have discovered a large range, from brand new to millions of years old. The youngest rock is found right at the ridges and is evidence that the tectonic plates are moving apart. This process continues, and the seafloor keeps spreading, pushing the rock farther and farther away from the ridge. The oldest seafloor is found at the greatest distance from the ridge Evidence gathered from the shapes of the continents, the patterns of rocks and fossils, and the ocean floor all support the theory that Earth's plates move over time. Knowledge of Earth's layers helps scientists understand how that could happen.

1. What is the relationship between the theory of continental drift and the theory of plate tectonics as described in the article?
   - **a.** One disproved the other
   - **b.** Both include the same information
   - **c.** One built on the other
   - **d.** Both were developed without evidence

2. What does the word *range* mean as used in the following sentence from the article?
   Scientists have studied the ages of the rocks surrounding the ridges and have discovered a large *range*, from brand new to millions of years old.
   - **a.** A row
   - **b.** A series of mountains
   - **c.** The open region over which animals feed
   - **d.** The difference between the least and greatest values

3. What is the author's purpose in describing continents as "matching up like puzzle pieces"?
   - **a.** To explain how puzzles work
   - **b.** To help readers understand a concept
   - **c.** To provide details that support a main idea
   - **d.** To provide context clues about a term's definition

4. According to the article, why were scientists slow to accept the theory of continental drift?
   - **a.** It was not supported by evidence
   - **b.** It was not developed scientifically
   - **c.** It did not explain how continents could move
   - **d.** It did not match people's observations of Earth

5. Which information in the article is best supported by the included maps?
   - **a.** Rock formations provide evidence to support continental drift.
   - **b.** Over time, this landmass separated, and its pieces drifted apart.
   - **c.** Scientists found ridges circling Earth's surface underneath the oceans.
   - **d.** The movement of material and energy in Earth's layers drives plate movement.

6. Explain how this article illustrates the relationship between the development of technology and the advancement of science. Include at least one specific example from the article in your response.

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Plate Tectonics Answer Key

1. **c.** *One built on the other*

2. **d.** *The difference between the least and greatest values*

3. **b.** *To help readers understand a concept*

4. **c.** *It did not explain how continents could move*

5. **b.** *Over time, this landmass separated, and its pieces drifted apart.*

6. *The article illustrates the relationship between technology and the advancement of science by explaining that the theory of continental drift did not easily gain acceptance because it did not explain how the continents could move.*