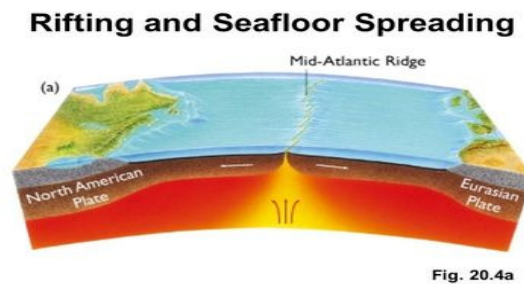


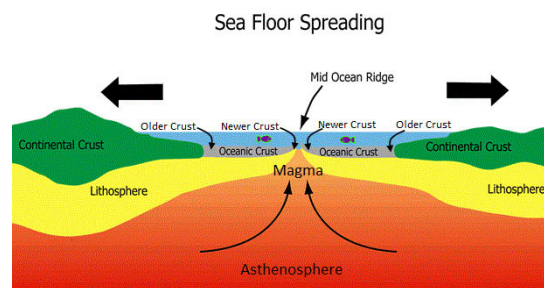
Theory of Plate Tectonics

1. Wegener's evidence for continental drift did not explain how entire continents could change locations, so his theory was rejected by scientists of his time.
2. Wegener and the other scientists of his time did not know that Earth's surface is broken into large, rigid, movable slabs of rock called **tectonic plates** that slide over a layer of partly molten rock.
3. New scientific equipment developed since the 1940s has allowed scientists to gather evidence from the sea floor and **THE MID-OCEAN RIDGE**.

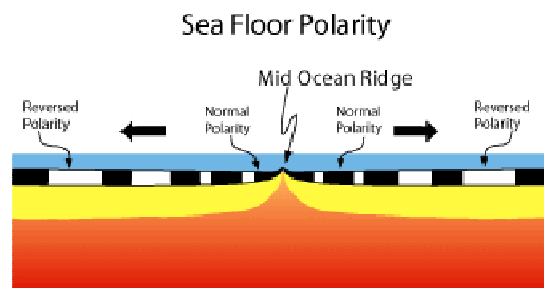
Evidence from mapping the sea floor: When explorers began to map the ocean floor, they discovered undersea mountain running north to south down the length of the Atlantic Ocean, which they named the *Mid-Atlantic Ridge*.



Evidence from ocean rock and sediments: Rocks taken from the Mid-Atlantic Ridge were younger than other ocean rocks.

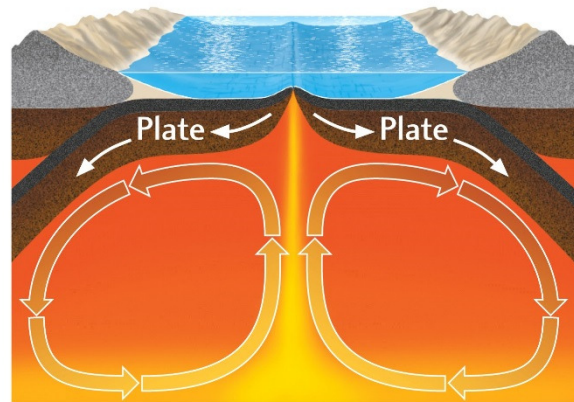


Evidence from paleomagnetism: The direction of Earth's **magnetic polarity** can experience a **magnetic reversal** over thousands of years

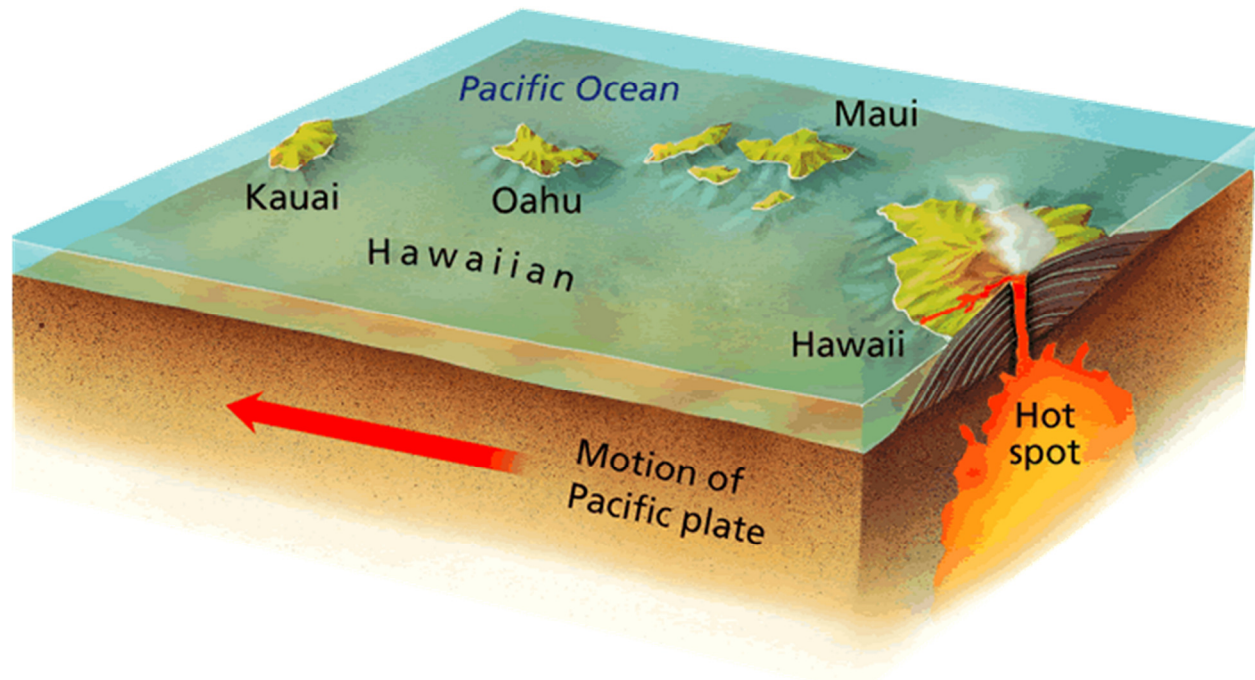


J. *Tuzo Wilson* combined the concepts of sea floor spreading and paleomagnetism to explain continental drift, laying the groundwork for the **Plate Tectonic Theory**:

- The **Plate Tectonic Theory** states that Earth's surface is broken into large plates that move apart and then rejoin, sliding over the semi-fluid rock below.
- There are about 12 major tectonic plates and many smaller ones.
- **Mantle convection** is thermal energy transfer in the mantle where hot, light magma rises and cold, dense magma sinks. This rotation of magma cause movement of the plates (**this is the one question Wegener could not answer)
- Heat to keep the mantle molten comes from radioactive elements.



A geologic **hot spot** is the location of excess radioactivity, causing magma to rise to Earth's surface. Also referred to as **Mantle Plume**.



The Hawaiian Islands formed as a tectonic plate passed over a hot spot and magma rose up from under Earth's surface.

Name: _____

Pd: _____ Date: _____

Quick Check #2

1. Why were Wegener's ideas about continental drift originally rejected?

2. Explain the implications of evidence from each of the following areas.

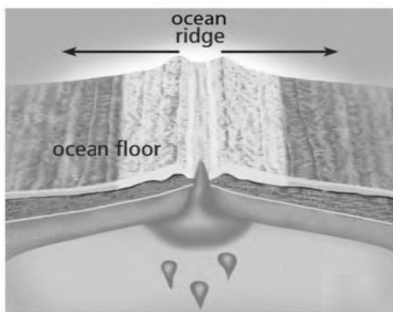
(a) mapping the sea floor

(b) analyzing ocean rock and sediments

(c) paleomagnetism

3. How did the Hawaiian Islands form?

4. What does the theory of plate tectonics state?



5. Which feature is shown in the diagram?

- A. hot spot
- B. sea floor
- C. paleoglaciatio
- D. jigsaw fit

5. What is the source of energy for convection currents and hot-spot activity in Earth's mantle?
