

Unit 2: Plate Tectonics Study Guide

Summary:

- The theory of **CONTINENTAL DRIFT** is that the continents slowly move around the Earth and is supported by evidence from **LAND FEATURES, FOSSILS**, and ancient **CLIMATE**.
- The continents have drifted together to form **SUPERCONTINENTS** like Pangaea, and then later drifted apart again in a **CYCLE** that has repeated several times during Earth's 4.5 billion year history.
- Evidence that supports **SEA FLOOR SPREADING** includes **MOLTEN MATERIAL** on the ocean floor, **MAGNETIC STRIPES** in ocean floor rocks, and **DRILLING SAMPLES** that show the age of ocean floor rocks.
- New oceanic crust is created at **MID-OCEAN RIDGES (DIVERGENT BOUNDARIES)** and is destroyed by **SUBDUCTION** at **DEEP-OCEAN TRENCHES (CONVERGENT BOUNDARIES)**.
- Earth's lithosphere is broken into over 12 **TECTONIC PLATES** that slowly move due to **CONVECTION CURRENTS** in the mantle.

Key Terms: continental drift, Pangaea, fossil, mid-ocean ridge, sea-floor spreading, deep-ocean trench, subduction, tectonic plate, plate tectonics, fault, divergent boundary, convergent boundary, transform boundary, rift valley, convection, convection currents

PLATE BOUNDARIES	
Divergent	tectonic plates spread apart; caused by tension stress; type of normal fault; constructive boundary where new ocean crust is created at mid-ocean ridges (ocean floor) or rift valleys (continental); frequent earthquakes and volcanic activity
Convergent	tectonic plate collide often forming mountains on continents and volcanic islands in the oceans; caused by compression stress; type of reverse fault; destructive boundary where ocean crust is subducted into the mantle and destroyed at a deep-ocean trench; frequent earthquakes and volcanic activity; causes megathrust earthquakes and makes up the Pacific Ring of Fire
Transform	tectonic plates slide past each other; type of strike-slip fault, caused by shearing stress; conservative boundary where crust is not destroyed or created; frequent earthquakes but no volcanic activity; famous example: San Andreas Fault

Concepts:

- Continental Drift was not accepted at first by the majority of scientists when Alfred Wegener proposed it in 1910. Why?
- How does the evidence of fossil creatures, land features, and ancient climate data support continental drift?
- Pangaea is the most famous, and most recent, supercontinent. Is the formation of supercontinents something that happened only once? Or is supercontinent formation a cycle that has repeated over billions of years?
- The solidified rock formations formed by molten material erupting at mid-ocean ridges are called pillow lavas. Where else do we find this type of rock formation and why does it support sea floor spreading?
- The magnetic stripes in ocean floor rocks are evidence that Earth's magnetosphere (magnetic field) reverses every 450,000 years on average. How is this also evidence of sea floor spreading?
- Rocks collected by drilling samples along the ocean floor show that the oldest ocean rocks are close to the continents and the youngest ocean rocks are along the mid-ocean ridges. How is this evidence of sea floor spreading?
- Earthquakes and volcanoes can occur anywhere on Earth, but are most common where?
- There are three types of heat transfer: conduction, radiation, and convection. Which moves heat from Earth's core to the lithosphere? How does it work?