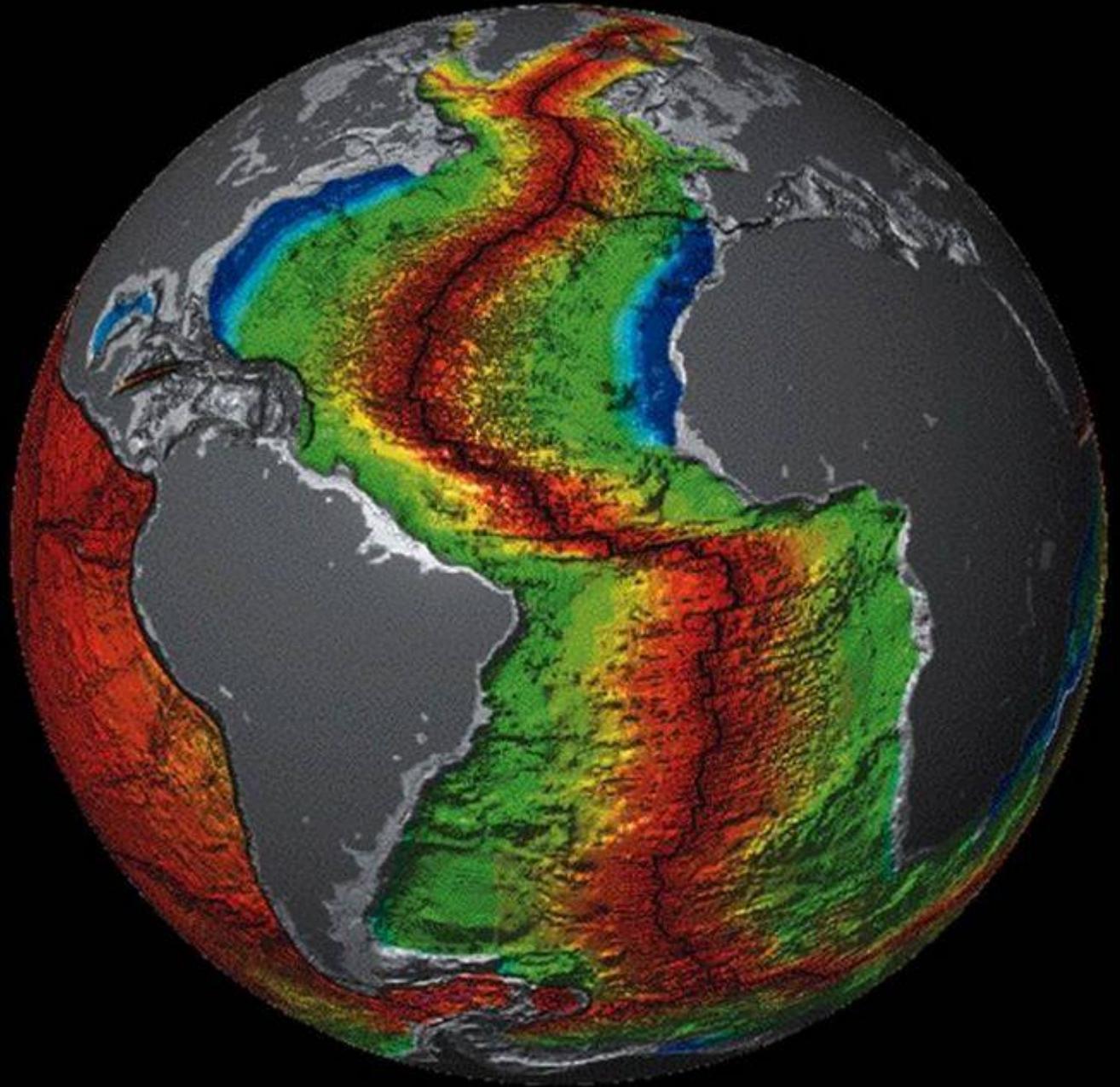


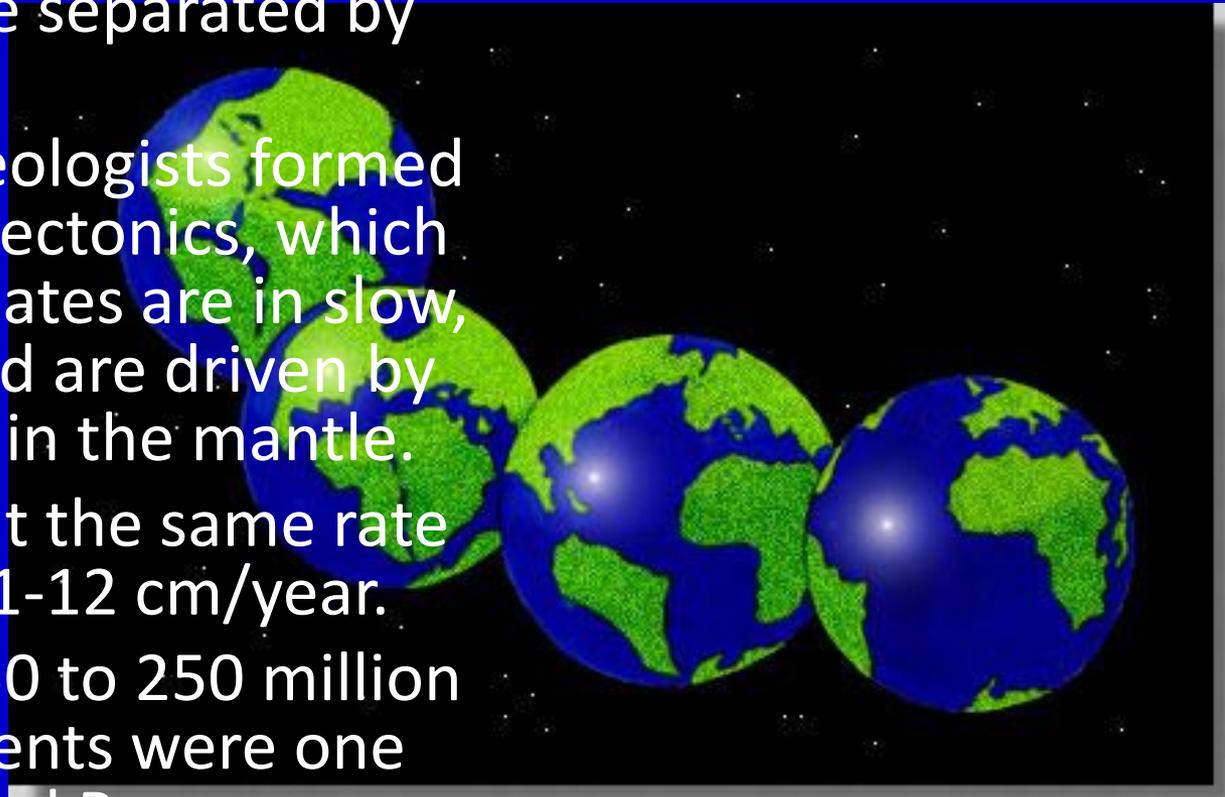
# Plate Tectonics

Unit  
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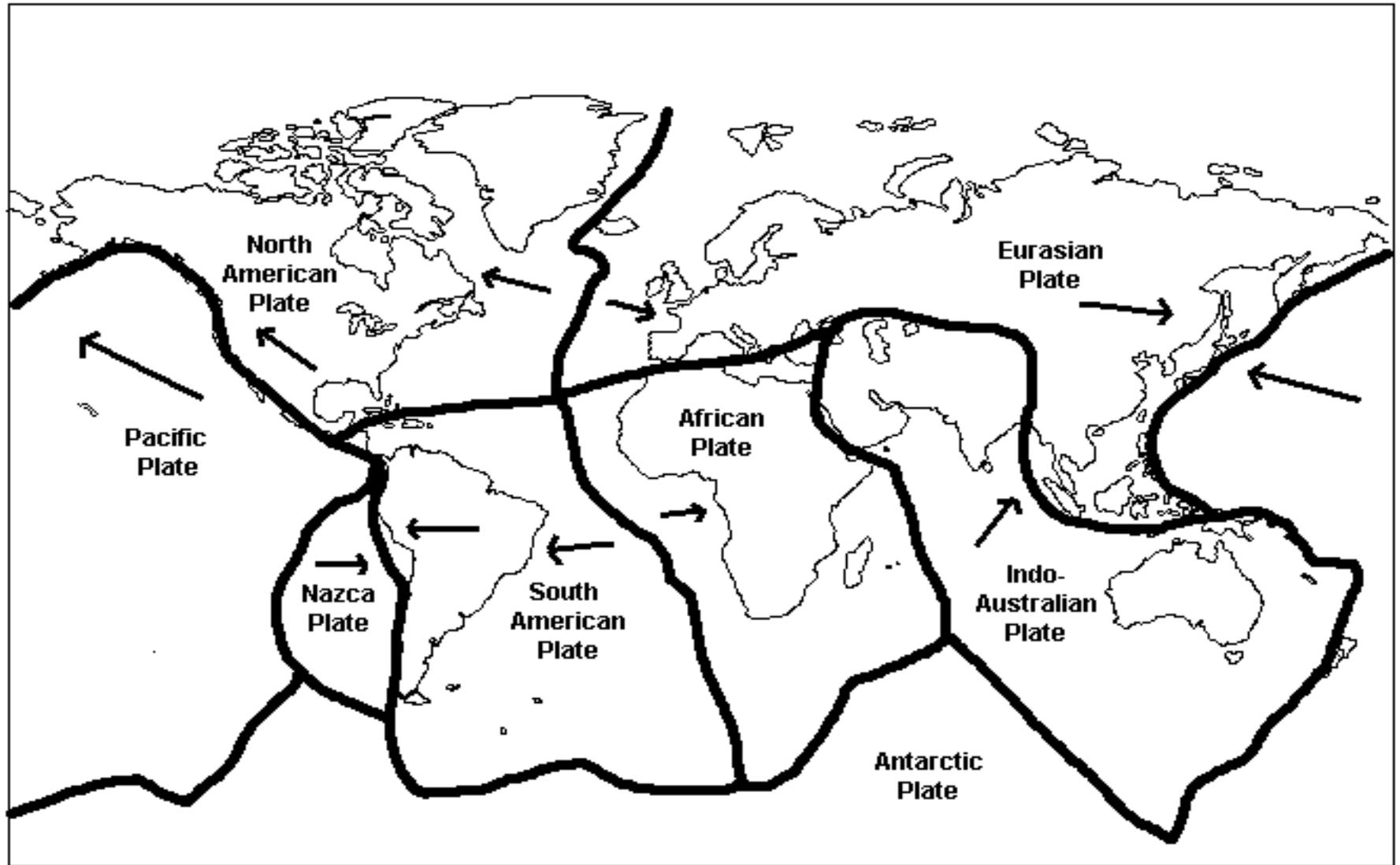


# Plate Tectonics

- Earth's lithosphere is like the eggshell of a dropped hard-boiled egg. It is broken into uneven pieces called plates that are separated by cracks.
- In the mid-1960s, geologists formed the theory of plate tectonics, which states that Earth's plates are in slow, constant motion, and are driven by convection currents in the mantle.
- Plates move at about the same rate as fingernails grow, 1-12 cm/year.
- It is believed that 350 to 250 million years ago, all continents were one supercontinent, called Pangaea, which began to break apart about 200 million years ago.



# Earth's Major Tectonic Plates



# Plate Boundaries

- Faults are breaks in Earth's crust where rocks have slipped past each other. They form along plate boundaries. Convection currents in Earth's mantle cause the plates to move.

- Divergent Boundaries

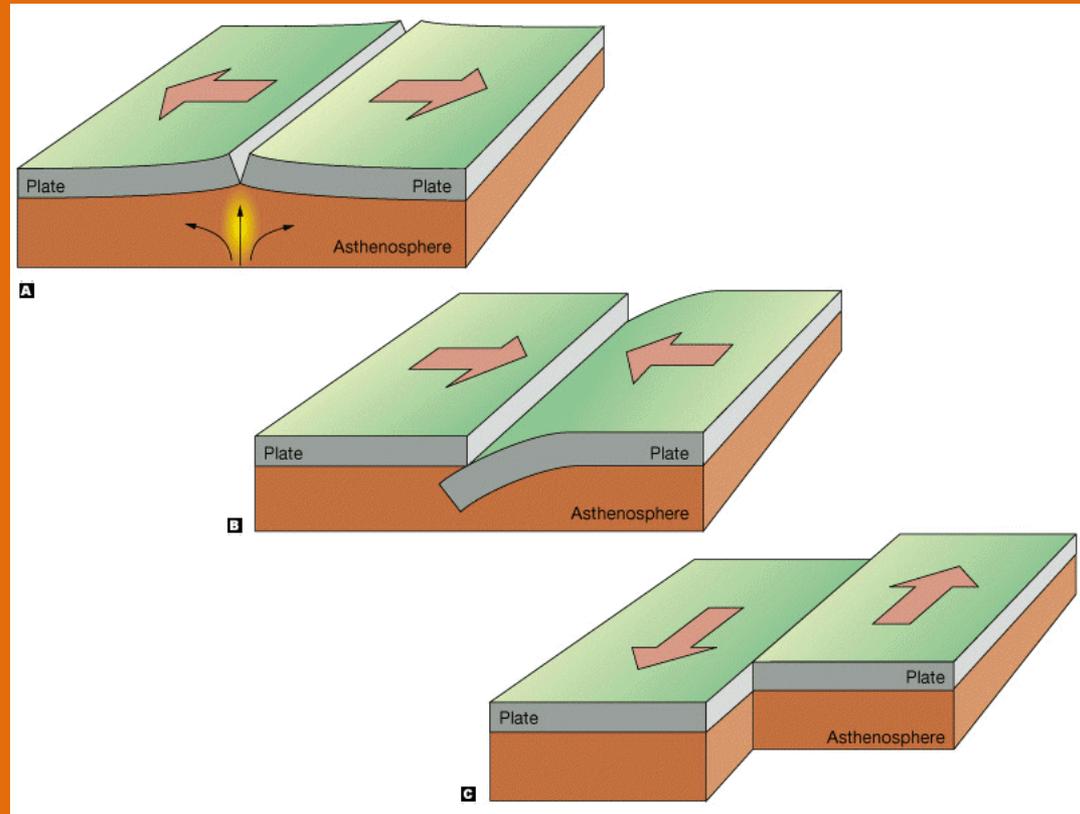
- Plates move away from each other

- Convergent Boundaries

- Plates collide

- Transform Boundaries

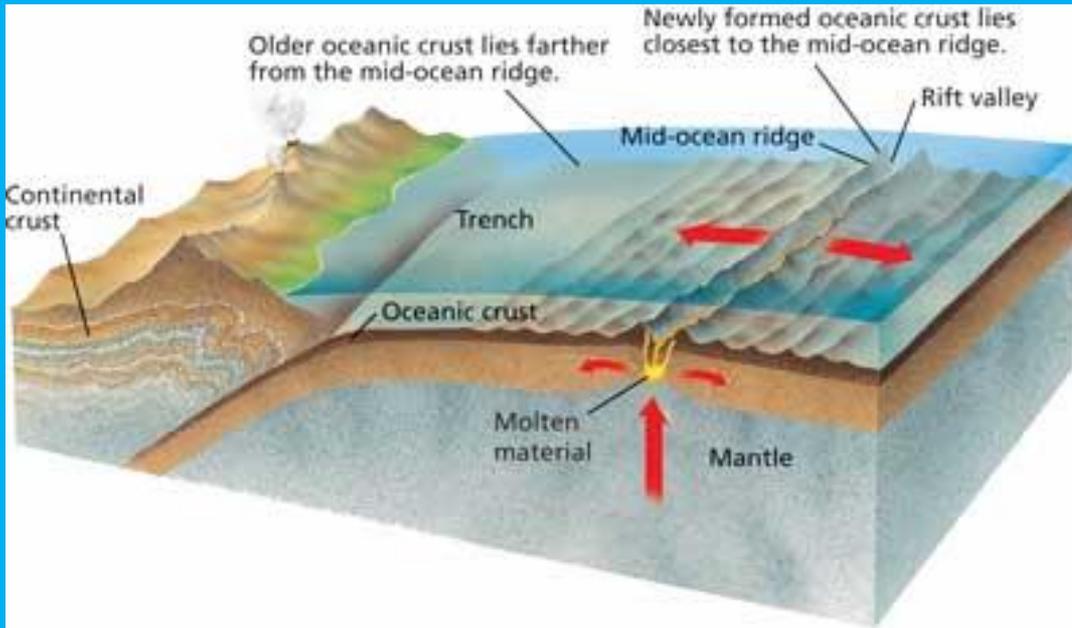
- Plates slip past each other in opposite directions



# Consequences of Plate Movement

## Creation of Ocean Basins

- Mid Ocean Ridges
  - Divergent plate boundaries at the ocean floor
  - Magma from deep within the Earth rises to the top, hardens, and forms new sea floor. It can build up to make underwater chains of mountains
- Deep-Ocean Trenches
  - Convergent plate boundaries
  - Ocean floor that was created by cooling magma becomes more dense as it solidifies, so when it reaches a continental plate, it goes through subduction. (It sinks below and becomes part of the magma again.) This forms a deep underwater canyon called a deep-ocean trench.



# Consequences of Plate Movement

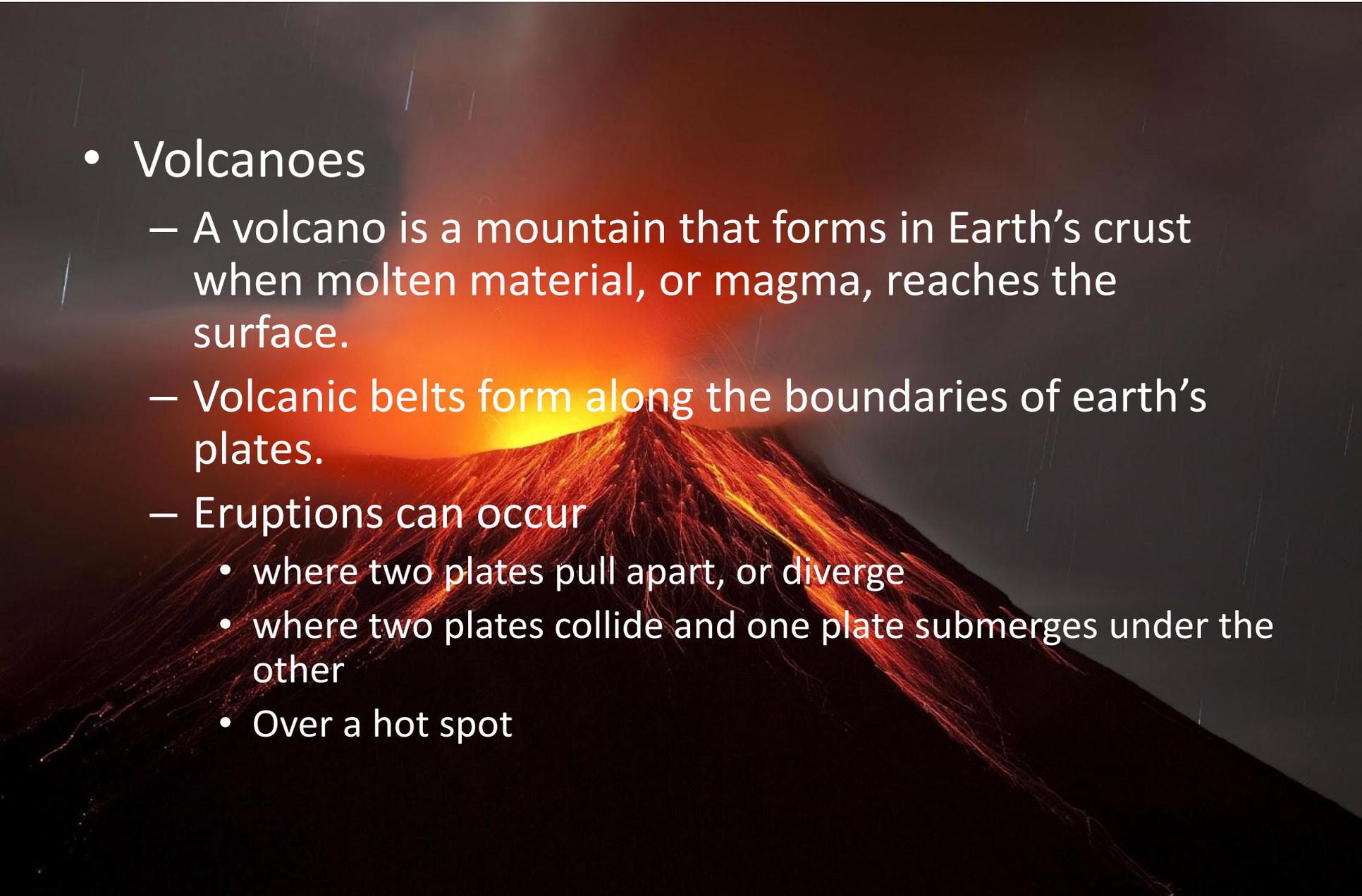
- Earthquakes
  - The shaking and trembling that results from movement of rock beneath Earth's surface
  - Plate movements produce stress in Earth's crust, adding energy to rock and forming faults. Stress increases along a fault until the rock slips or breaks, causing the earthquake, and releasing enormous amounts of stored energy
  - The energy travels as seismic waves, which are vibrations that are similar to sound waves. They travel through Earth carrying energy released by the earthquake. Their speed and path depend on the material through which they travel.



# Consequences of Plate Movement

- Volcanoes

- A volcano is a mountain that forms in Earth's crust when molten material, or magma, reaches the surface.
- Volcanic belts form along the boundaries of earth's plates.
- Eruptions can occur
  - where two plates pull apart, or diverge
  - where two plates collide and one plate submerges under the other
  - Over a hot spot



# Earthquakes and Volcanoes are common along the Ring of Fire



# Consequences of Plate Movement

- Mountains

- Mountains can form where plates collide.

- When more dense oceanic crust pushes up the less dense continental crust, mountain ranges can form.
- When two plates of continental crust collide, neither piece is dense enough to sink far in to the mantle, so the collision squeezes the crust in to high mountain ranges.

