

Lesson Outline for Teaching

Lesson 3: Mountain Building

A. The Mountain-Building Cycle

1. Mountain ranges form slowly, and they change slowly, over millions of years.
 - a. Because many different collisions occur to form the mountains, mountains are made up of many different kinds of rocks.
 - b. The processes of weathering and erosion (either order) can carry away all or parts of mountains.
2. When plates collide at a(n) plate boundary, a combination of folding, faulting, and uplift form mountains.
 - a. The forces that originally brought the plates together can become inactive after many millions of years.
 - b. When the plate boundary is no longer active, one new continent is formed from the two old continents.
 - c. With no compression at a(n) convergent plate boundary, the mountains stop growing.
3. The movement of Earth's tectonic plates causes the continents to always be changing.
 - a. A(n) divergent plate boundary that forms on a continent often forms close to the place where two plates first collided.
 - b. First a large split, or rift, forms; as it grows, water flows into it, forming a(n) ocean.
4. Weathering has rounded the peaks and lowered the elevations of the Appalachian Mountains.
5. As a mountain erodes, the root under it must rise to restore the balance between what is left of the mountain and how it floats on the mantle.
 - a. Rocks deep under continents rise slowly toward Earth's surface.
 - b. In old mountain ranges, metamorphic rocks that formed deep below the surface are exposed on the top of mountains.

B. Types of Mountains

1. Plate movements can change the positions of rocks within a mountain range.
2. Folded mountains are made of layers of rock that are folded.
 - a. When erosion removes the upper part of the crust, folds are exposed on the surface.
 - b. The folds are perpendicular to the direction of the force of compression that created them.

Lesson Outline continued

3. Parallel ridges that form where blocks of crust move up along faults are called fault-block mountains.
 - a. If the tension that caused the mountains to form pulled in an east-west direction, the mountains will form ridges oriented in the north-south direction.
 - b. Fault-block mountains have a high ridge next to a(n) valley; between these two landforms is a(n) fault where the movement that caused the landforms occurred.
4. Uplifted mountains form when large regions of land rise with very little deformation of Earth's crust.
 - a. One idea of how uplifted mountains form involves sinking mantle pulling the crust downward, which causes the crust near the surface to become compressed and thicker.
 - b. As the crust thickens, the upper part of the crust rises to maintain isostasy; sometimes the crust rises high enough to create tall mountains.
5. Volcanoes are special kinds of mountains.
 - a. Volcanic mountains form when molten rock erupts onto Earth's surface and hardens.
 - b. Volcanic mountains that are dormant have not erupted in a long time, but they might erupt again someday.

Discussion Question

How are folded mountains and fault-block mountains similar to one another? How are they different from one another?

Both form in the direction that is perpendicular to the original forces that created them. Folded mountains form at the edges of two continents, where plates collide and the crust is hot enough to fold. Fault-block mountains form within a continent, where tension pulls the crust apart, causing faults to form.