

Edible Plate Tectonics–Milky Way Candy Bar Activity

Problem: How do the tectonic plates that make up the lithosphere move about on top of the asthenosphere? What geologic features form as a result of these plates moving?



Background Information - (READ before performing lab!) Plate Tectonics is Geology's most important theory - it explains so much about our planet! Most volcanoes and earthquakes occur along the boundaries of tectonic plates. This theory also explains how certain surface features such as mountain ranges, ocean trenches, and fault lines formed.

The lithosphere, which is made up of the entire crust and the uppermost part of the mantle, is broken into separate pieces that fit together like a puzzle - these are the tectonic plates. These plates move because of convection currents underneath them in the asthenosphere. The mantle material that makes up the asthenosphere is a dense, plastic-like layer of solid rock. The extreme heat and pressure causes this rock to move and flow. The plates that sit on top move as well. The flowing rock in the asthenosphere moves underneath them.

The following activity uses a scale model to introduce some of the basic concepts of the Plate Tectonics theory.

Procedures:

1. Carefully unwrap your candy bar and place it on top of the wrapper. Using your fingernails and finger tips make a few cracks across the top of the candy bar.
2. Hold the candy bar with both hands with the top of it facing up. Slowly stretch the candy bar. Pull it apart only a couple of millimeters. DO NOT pull the candy bar completely apart. The chocolate should separate exposing the caramel. The caramel represents molten material that can rise to the Earth's surface.
3. Slowly pushed the candy bar back together again. The chocolate may crumble. "Mountain ranges" may form where pieces of chocolate overlap. Also one chocolate "plate" may slide beneath another chocolate "plate". This is called subduction.
4. Continue to pull the candy bar apart and push the candy bar back together until you have a good sense of how the chocolate "plates" can be moved by the motion of the caramel "asthenosphere" beneath.
5. When finished, pull the candy bar completely apart, but don't eat it yet! Look at the exposed interior and think about the candy bar as a model of the Earth's layers.
6. Answer the questions and draw pictures where necessary BEFORE eating the candy bar!

Conclusion Questions:

1. Describe the consistency of each of the 3 candy bar layers. Using the candy bar as a model for a portion of the Earth, what do each of the 3 candy bar layers represent?

2. Create a labeled sketch AND describe what you observed when the candy bar was pulled apart.

Description:

3. Create a labeled sketch AND describe what you observed when the candy bar was pushed together.

Description:

4. What natural process moves tectonic plates over the surface of the Earth?
(use the summary if you need help)

5. From your study of Plate Tectonics, explain the frequent occurrence of earthquakes along the boundaries between lithospheric plates.