

STUDENT WORKSHEET

Feasting on Faults by Michelle B. Buchanan

Grade level: 4

NGSS Reference: ESS2.B: Plate Tectonics and Large-Scale System Interactions

Objectives: The student will investigate, make observations, and analyze geologic processes of plate tectonics.

Key concepts include:

- a) how geologic processes are evidenced in Antarctic mountains;
- b) tectonic processes (compressional, tensional, and transversal forces).

Procedures for Learning Experience	Guiding Questions	Materials	Evaluation	Time
<p>Engage: Show students a Polar TREC video 1:40-4:00 minute time mark on the video (http://youtu.be/8AZtWBLBMsY). Ask students to describe the different types of landforms they saw in the video.</p>	<p>Guide the students through effective questioning that different landforms are formed through different tectonic forces.</p>	<p>Computer with Internet access Projector</p>	<p>Student Answers during whole class discussion</p>	<p>5 min.</p>
<p>Explore: Provide students cylinder-shaped gum, markers, and three index cards. Tell the students that the gum represents land. As students begin to manipulate the gum, remind them that they are to mimic natural processes (to prevent them from pressing down on the gum). Have students write their three different gum manipulations each on a card with the marker and place the manipulated gum on the corresponding card.</p>	<p>Determine three different ways their piece of “Earth” can change shape.</p>	<p>cylinder-shaped gum (i.e., Double Bubble, Hubba Bubba) - 3 pieces of gum per pair of students marker for writing descriptions 3 index cards per pair of students</p>	<p>Student descriptions on index cards</p>	<p>10 min.</p>

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<p>Explain: Ask random students to share their work and compare it to what they saw from other groups. Pass out the Student Worksheet to each student. Have students identify three actions that were the same throughout most groups: push together, pull apart, and rip. Model for students by writing on the board these words with arrows identifying the actions. Have students copy this information on their Student Worksheet. Provide students the correct terminology for each action (together - convergent, apart - divergent, rip - transversal). Show students the animations, and ask them to explain what is happening in each.</p>	<p>How does this gum represent Earth? What happens when you push on both ends of the gum? What happens when you pull both ends of the gum apart?</p>	<p>Student Worksheet Whiteboard for whole class discussion Computer with Internet access Projector to show http://bit.ly/1WsE3f</p>	<p>Student answers during whole class discussion</p>	<p>10 min.</p>
<p>Elaborate: Using the Internet (single computer station, whole class viewing, or iPads for small groups of students), the students will further investigate tectonic activity. Students will use the American Museum of Natural History's Ology website to answer questions on the Student Worksheet.</p> <p>Before giving the students the Ticket-Out-The-Door, review the questions in the Student Worksheet.</p>	<p>What type of geologic feature would resemble pulling apart the gum? (valley, trench) Pushing together the gum? (mountain, volcano) Sliding against each other? (earthquake)</p>	<p>Student Worksheet Computer with Internet access Projector</p>	<p>Student Answers</p>	<p>20 min.</p>
<p>Extend: Give students the Ticket-Out-The-Door (last part of the Student Worksheet) for final evaluation of student understanding.</p>			<p>Student Answers</p>	<p>5 min.</p>
<p>Note: This lesson will serve as an introduction to the Theory of Plate Tectonics. This lesson was adapted from http://bit.ly/11Cjmu0</p>				