

CURIOSITY AT HOME

GRAHAM CRACKER PLATE TECTONICS



The Earth's crust is made up of a number of giant and shifting plates that drift atop the softer mantle layer. Even though these plates move very slowly, this movement has created a dynamic world with mountains, earthquakes and volcanoes. In this activity the graham crackers represent the plates of earth and the peanut butter or frosting represents the magma (molten rock) underneath. The area where two plates meet is called a **plate boundary**. Create three major plate boundaries and watch what happens to the earth's crust as you move the plates!

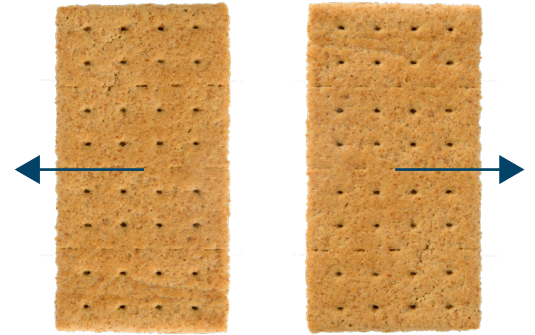
MATERIALS

- Graham crackers
- Peanut butter or frosting
- Science notebook or paper
- Something to write with
- Wax paper
- Ruler
- Water

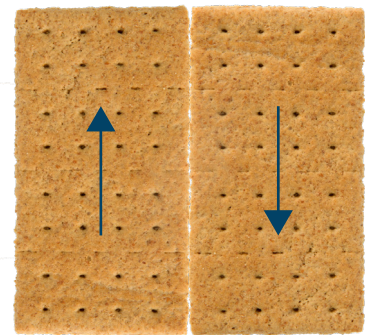
PROCEDURE

- Cut a piece of wax paper that is around 8–10 inches long. Spread a ½ inch layer of peanut butter or frosting on top of the wax paper, this will represent the magma. Place two graham crackers on top of your magma.
- **Divergent Boundary:** Push the two graham crackers away from one another and watch the magma. Divergent zones occur on the ocean floor where plates spread apart. As the plates separate, magma oozes up, cools and hardens to make new crust.
- **Transform Boundaries:** Put the two crackers side by side, and slide one forward (away from you), and one backward (toward you). When plates slide past one another in this way, they often get caught on one another. When they break free, an earthquake happens. San Francisco is located on a transform fault.
- **Convergent Boundary:** Put the two graham crackers side by side on the waxed paper. Wet the edge of one of the crackers with some water. Slowly push them together. When the crackers edge crumbles together and raises up, you have made a mountain range! This is how the Himalayas formed.

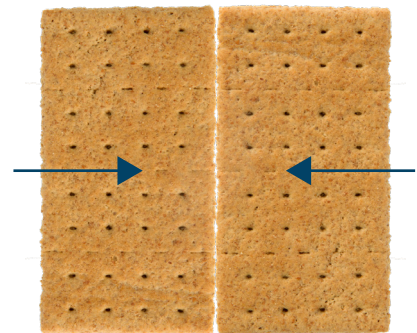
Divergent Boundary



Transform Boundary



Convergent Boundary



Experiment continued on next page...



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TRY THIS

Sometimes convergent boundaries can turn into subduction zones! Push the two crackers together, making one slide underneath the other. This occurs off the coast of Washington State, where the ocean plate slides underneath the land plate. When this happens on the Earth, the plate that slides underneath eventually melts from pressure and heat. That melted magma slowly rises to the surface, and can cause volcanoes.

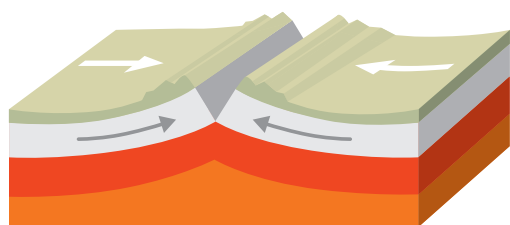
DID YOU KNOW

Tectonic plates are steadily moving an average of three to five centimeters every year. That means that earth's crust and human fingernails grow at about the same rate. How would your experiment change if you could only move your graham crackers three to five centimeters every year?

North American Plate



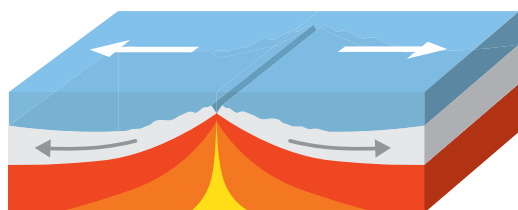
Convergent Plates



Subduction Zone



Divergent Plates



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K–2 GRADE EXPLORATION

Here are some questions you can explore together:

- How do earthquakes and volcanoes change the environment around them?
- Scientists use evidence and clues to learn how old a tectonic plate is. What kind of evidence or clues can you find around the room to show how old you are?
- Plate tectonics cause tall mountains on land and deep trenches in the ocean. What types of rocks and other evidence do you think you can find at the bottom of a deep trench? What about at the top of a tall mountain?



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3–5 GRADE EXPLORATION

Explore the following questions and write your observations in your science notebook.

- Where would earthquakes and volcanoes be found on your graham cracker plates?
- What patterns did you notice between the three boundaries?
- What do you think earth plate boundaries will look like in a million years?



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6–8 GRADE EXPLORATION

Explore the following questions and write your observations in your science notebook.

- The Mariana trench is the deepest oceanic trench on earth. What type of plate boundary do you think the Mariana trench is located at? What geological process caused this to happen?
- What evidence could scientists use to see how the plates have moved and changed over millions of years?
- The Cascade mountain range, in Washington State, is located near a convergent boundary that is constantly moving. Do you think the movement of these plates causes the cascade mountains to get taller, smaller, or stay the same? Explain your answer.



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