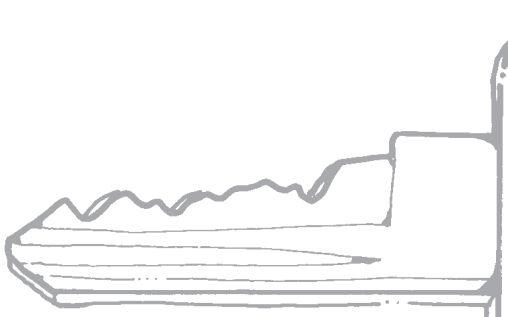
Finding Faults with Food



Key Question

How can you use models to learn about what takes place along the boundaries of plates?

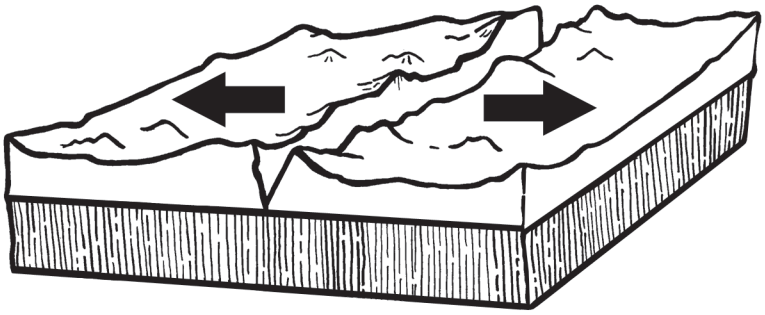
Learning Goals

Students will:

- identify the three types of plate boundaries,
- model how plates can move, and
- identify some features plate movements can create.

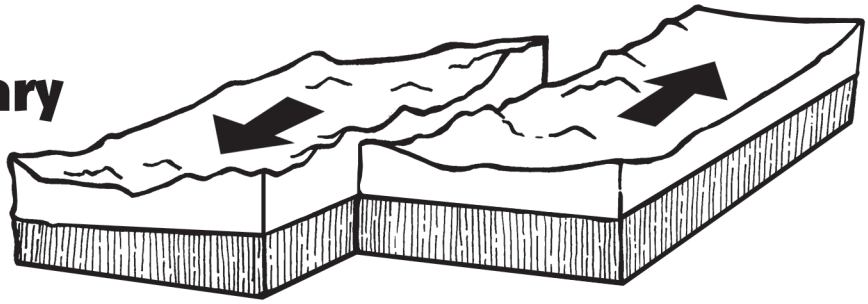
Study Prints

Convergent Boundary



Divergent Boundary

Transform Boundary



Finding Faults with Food

Two types of plates:
- Oceanic
- Continental

Three types of plate movement:
- Divergent
- Convergent
- Transform

Things you will need:
- Aluminum foil
- Chocolate icing
- Plastic spoon
- Craft stick
- 2 small quarters of a graham cracker
- 2 soft chocolate chip cookies
- 2 hard chocolate chip cookies

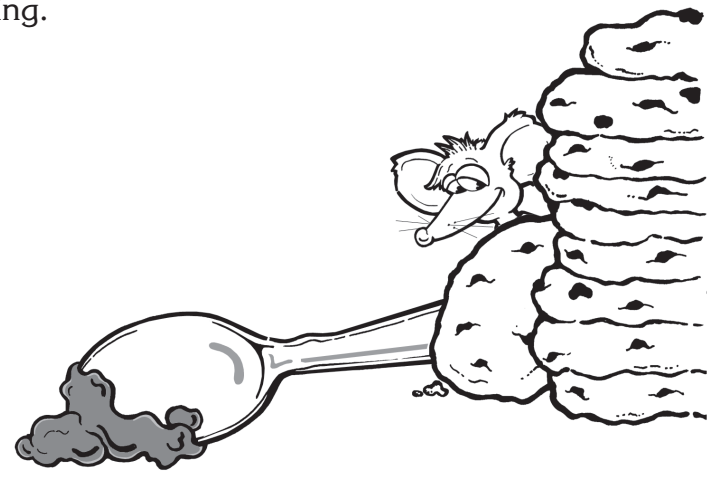
The first type of plate movement you will model is at a **divergent** plate boundary. Place a large spoonful of icing on the aluminum foil. You will need to place two pieces of graham cracker next to each other on the icing. Press down slowly on the graham crackers. They represent **oceanic** crust. Oceanic crust is floating on the asthenosphere. The icing models the asthenosphere.

Slowly push the graham crackers about a centimeter apart. Notice how the frosting is exposed where the crackers are separated. This is a model of how magma comes to the surface where real oceanic plates are moving apart.

Divergent Boundary

Most divergent plate boundaries are located on **oceanic** crust. When plates begin to pull apart on continental crust, rift valleys are made. The Great Rift Valley in Africa is an example of this type of plate movement.

Draw and label your model. Include these things: oceanic plates and magma. Draw arrows to show the directions the plates are moving.



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The second type of plate movement you will explore is when **oceanic** crust **converges** with (meets) **continental** crust. Pick up one of the graham crackers. Smooth out the icing and place a hard chocolate chip cookie on the icing where the graham cracker was located.

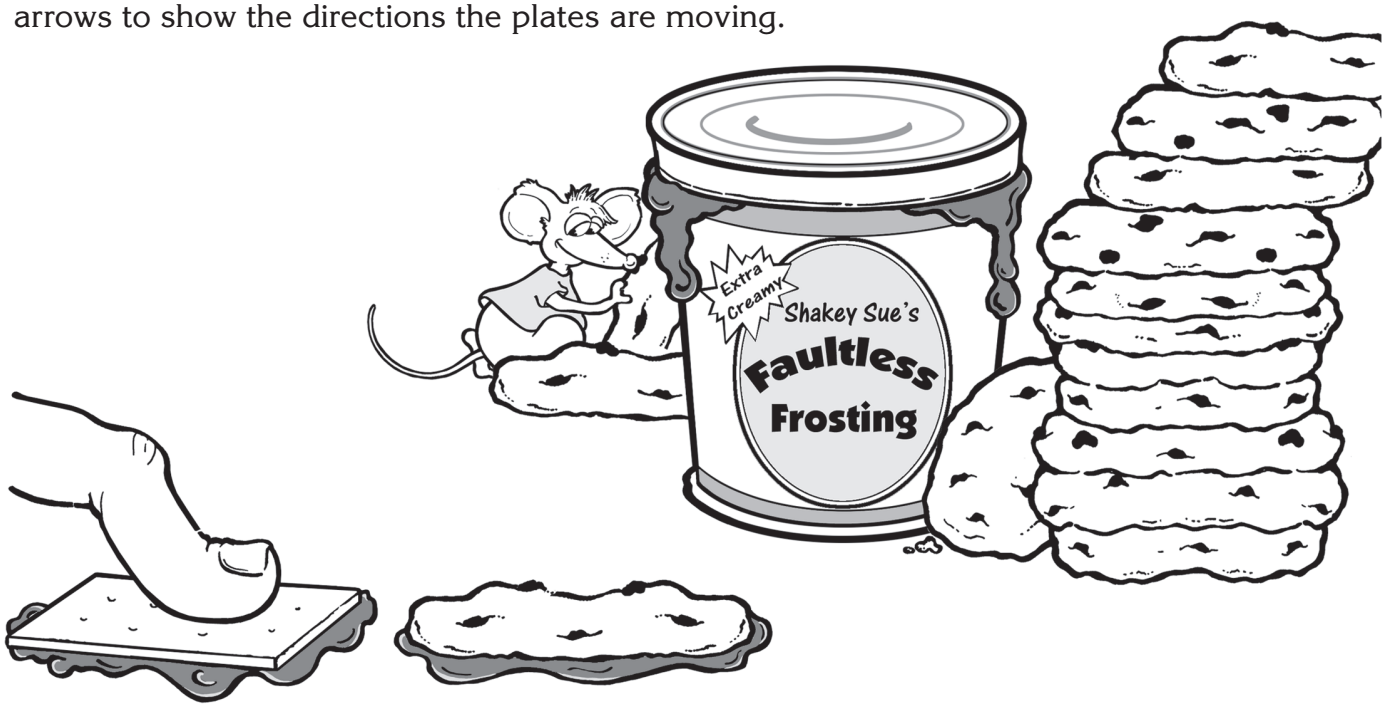
The chocolate chip cookie represents continental crust. This is thicker and less dense than oceanic crust. It floats higher on the asthenosphere, so don't push it down into the icing.

Gently move the chocolate chip cookie and the graham cracker toward each other until the edge of the chocolate chip cookie is on top of the edge of the graham cracker. This models how the oceanic plate is **subducted** below the continental plate.

Convergent Boundary

When plates meet like this, the oceanic plate goes under the continental crust and a deep trench is formed. You will often find volcanoes along the edge of the continental crust where the oceanic crust is going under.

Draw and label your model. Include these labels: oceanic plate, continental plate, trench. Use arrows to show the directions the plates are moving.



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Now you will explore when **continental** crust **converges** with (meets) **continental** crust. Remove the graham cracker and the hard chocolate chip cookie from the icing. Smooth out the icing. Put the two soft chocolate chip cookies into the icing. Slowly push the cookies toward each other. Notice how the edges crumple and push up.

This is how mountains form where continental plates push together. When continents move toward each other, there is nowhere for the rock to go but up.

Draw and label your model. Include these labels: continental plates, mountains. Use arrows to show the directions the plates are moving.

Convergent Boundary

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The last type of plate movement you will explore is when **continental** plates slide past each other. These are called **transform** plate boundaries. Remove the two soft chocolate chip cookies. Put two hard chocolate chip cookies into the icing. Push the two cookies together. Apply pressure so that two cookies begin to slide past each other.

This is the same type of movement that is taking place at the San Andreas Fault in California. You should also notice that small bits of cookies are crumbling where the two cookies are pressing together. This models that the land is under stress where plates are passing beside each other.

These experiences show some of the processes that are taking place between the plates of the Earth. Look at the drawings of the plate boundaries and tell how the models helped you learn about each type of plate interaction.

Transform Boundary

Draw and label your model. Use arrows to show the directions the plates are moving. Write the word "stress" where earthquakes would originate.

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Connecting Learning

1. What are the two types of plates?

2. How are divergent plates different from convergent plates?

3. What are some of the features of the Earth that are created by plate movements?

4. How did the models help you learn more about how plates on the Earth move?

5. The Appalachian Mountains are a result of two continental plates pushing together. What does that tell you about the past geologic history of the plate the Appalachian Mountains are on since there is not a plate pushing on the North American plate?

6. What are you wondering now?

