

Name: _____ Date: _____

Student Exploration: Plate Tectonics

Vocabulary: asthenosphere, collisional boundary, convergent boundary, crust, divergent boundary, earthquake, lithosphere, mantle, plate, plate tectonics, subduction zone, transform boundary, volcano

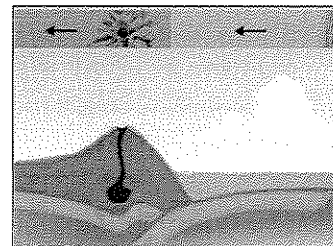
Prior Knowledge Questions (Do these BEFORE using the Gizmo.)

1. **Volcanoes** are openings in Earth's **crust** where lava, gas, and ash can erupt. Where are active volcanoes located? _____

2. An **earthquake** is a violent shaking of Earth's surface. Where are earthquakes common? _____

Gizmo Warm-up

Volcanoes, earthquakes, mountains, and other features of Earth's surface owe their origin to the movements of **plates**: enormous, slowly-moving sections of Earth's crust. At plate boundaries, plates collide, move apart, move under or over each other, or slide past one another. The theory of **plate tectonics** describes how the plates move, interact, and change the physical landscape.



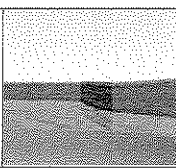
The *Plate Tectonics* Gizmo™ shows a cross-section, or side view, of Earth. (Not to scale.) Above the cross section is a bird's-eye view of the same location.

1. Turn on **Show labels**. What are the layers of Earth that you can see? _____

The **lithosphere** is a layer of rigid rock that consists of the crust and the upper part of Earth's **mantle**. The **asthenosphere** is a layer of the mantle that can deform like plastic.

2. Turn on **Boundary name**, and click on each boundary. What four boundaries do you see? _____



Activity A: Sliding plates	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> • Select BOUNDARY A. 	
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Question: What happens when plates slide past one another?

1. Observe: Boundary A is a **transform boundary**. The arrows below the BOUNDARY A label will move the plates. Click the left arrow once to see how the plates move.

How would you describe the motion of plates in a transform boundary? _____

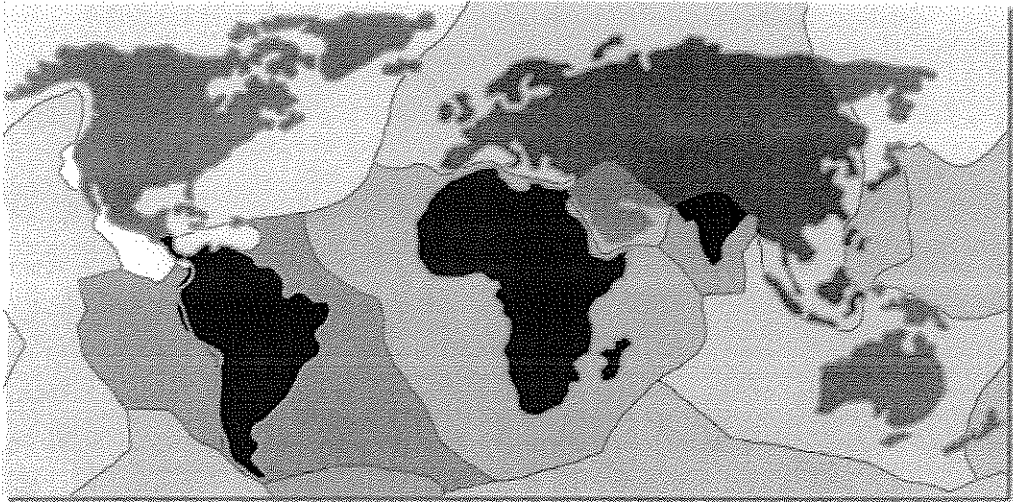
2. Sketch: Draw a bird's-eye view of the plate boundary before and after the plate motion. Draw an arrow to show which way the plate moved.

Before movement

After movement

3. Locate: Turn on **Show location**. Where on Earth can you find this type of boundary? (Note: You can refer to a world map or atlas for location names.)

Highlight these locations on the map below.

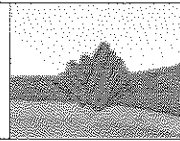


Activity B:

Colliding continents

Get the Gizmo ready:

- Turn off **Boundary name** and **Show location**.
- Select **BOUNDARY B**.



Question: What happens when two continents collide?

1. Observe: Boundary B is an example of a **convergent boundary**, where two plates are moving toward one another. When the two plates both contain continental crust, it is called a **collisional boundary**. Click the left arrow four times to see how the plates move.

How would you describe the motion of plates in a collisional boundary? _____

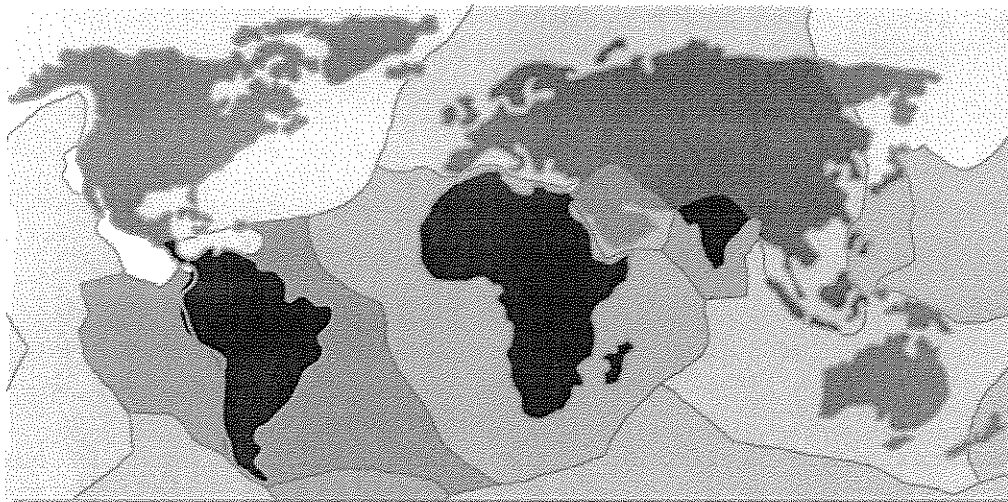
2. Sketch: Draw a side view of the plate boundary before and after the plate motion. Draw an arrow to show which way the plate moved.

Before movement

After movement

3. Locate: Turn on **Show location**. Where on Earth can you find this type of boundary? (Note: You can refer to a world map or atlas for location names.)

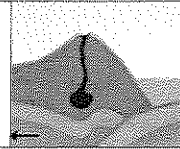
Highlight these locations on the map below.



Activity C:
**Oceanic crust
meets continental
crust**

Get the Gizmo ready:

- Turn off **Boundary name** and **Show location**.
- Select **BOUNDARY C**.



Question: What happens when ocean crust collides with continental crust?

1. Observe: Boundary C is another type of convergent boundary called a **subduction zone**. Click the left arrow four times to see how the plates move.

How would you describe the motion of plates in a subduction zone? _____

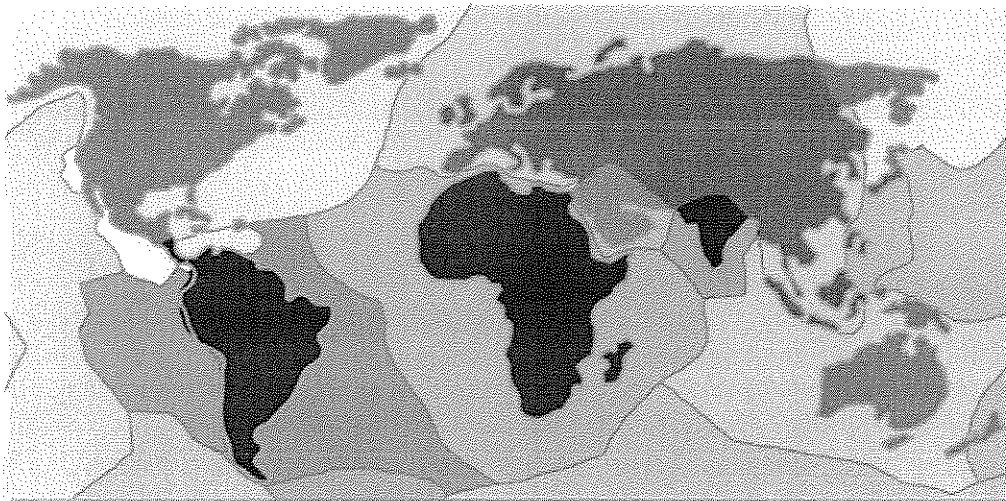
2. Sketch: Draw a side view of the plate boundary before and after the plate motion. Draw an arrow to show which way the plate moved.

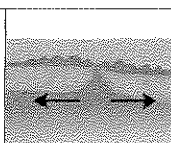
Before movement

After movement

3. Locate: Turn on **Show location**. Where on Earth can you find this type of boundary? (Note: You can refer to a world map or atlas for location names.)

Highlight these locations on the map below.



Activity D: Spreading plates	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> • Turn off Boundary name and Show location. • Select BOUNDARY D. 	
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Question: How is new crust formed?

1. Observe: Boundary D is a **divergent boundary**. Click the right arrow four times to see how the plates move.

How would you describe the motion of plates in a divergent boundary? _____

2. Sketch: Draw a side view of the plate boundary before and after the plate motion. Draw an arrow to show which way the plate moved.

Before movement

After movement

3. Locate: Turn on **Show location**. Where on Earth can you find this type of boundary? (Note: You can refer to a world map or atlas for location names.)

Highlight these locations on the map below.

