

Plate Boundary Lab

Name _____

Type of Margin	Divergent	Convergent	Transform
Motion	Spreading	Subduction	Lateral sliding
Effect	Constructive (oceanic lithosphere created)	Destructive (oceanic lithosphere destroyed)	Conservative (lithosphere neither created or destroyed)
Topography	Ridge/Rift	Trench	No major effect
Volcanic activity?	Yes	Yes	No

The diagrams illustrate three types of plate boundaries: (a) Divergent boundary: Two plates move apart, creating a ridge. Magma rises from the asthenosphere through the rift. (b) Convergent boundary: One plate subducts under another, creating a trench. This leads to a volcanic arc and earthquakes. (c) Transform boundary: Two plates slide past each other horizontally, causing earthquakes within the crust.

BACKGROUND: Plate tectonics theory states that Earth's crust is composed of 7 major plates and many smaller plates. In our previous lab, you learned that these plates move across the hot plastic upper mantle known as the asthenosphere due to convection currents. With all this motion, the plates are bound to crash into each other or move away from each other. Places where the plates touch are called plate boundaries. At the plate boundaries, plates may converge (collide), diverge (separate), or slide past each other in a lateral motion (transform boundary). In addition, some plates may appear to be inactive. In this lab, you will learn:

- How plates interact with one another
- Why some plates sink and others float
- What types of land formations are typical of convergent, divergent, and transform boundaries

Materials

2 thick blocks 2 thin plywood sheets
 shaving cream wax paper

Part 1 -- Divergent Plate Boundaries

Part 2 -- Convergent Plate Boundaries (Continental and Oceanic)

Part 3 -- Convergent Plate Boundaries (Continental)

Part 4 -- Transform Plate Boundaries

Read and follow all instructions for each part, then answer the questions that follow

Part 1 -- Divergent Plate Boundaries

Procedure:

1. Take two of thin plywood pieces, wax paper, shaving cream, and your spreading utensil.
2. Spread a thin layer of shaving cream on your wax paper (about 1 cm thick; the shaving cream should be wide enough to set your plywood pieces on top).
3. Lay the two pieces of plywood side by side on top of the shaving cream so they touch.
4. To imitate the result of diverging oceanic plates, press down on the boards as you slowly pull them apart in opposite directions.
5. Remove the plywood from the shaving cream and clean off as much cream as possible. Scrape off all shaving cream to reuse. DON'T wash it down the drain.

DISCUSSION QUESTIONS - PART 1

1. What happened to the shaving cream between the boards?

2. What do the plywood boards represent?

3. What does the shaving cream represent?

4. Name a specific location on the Earth where this kind of boundary activity takes place.

5. What type of feature is produced by this movement?

6. What is the process called that creates new ocean floor from diverging plates?

Part 2 -- Convergent Plate Boundaries (Continental and Oceanic)

Procedure:

1. Take one of the plywood boards you used in Part 1 and lay it on top of the shaving cream.
2. Lay the thick block next to the plywood board so they are almost touching, end to end.
3. Push the two "plates" slowly toward each other and observe which plate rides up over the other. On the actual surface of the Earth, the lower plate is subducted.
4. Clear off as much shaving cream from the plates as possible and set them aside.

DISCUSSION QUESTIONS - PART 2

1. What kind of plate is represented by the thin plywood board? _____
2. What kind of plate is represented by the thick board? _____
3. What happens when a tectonic plate gets subducted?

4. Name a specific location on the Earth where this kind of boundary activity takes place.

5. What features are formed on the continent along this boundary?

6. What feature is formed in the ocean along the subduction zone?

Part 3 -- Convergent Plate Boundaries (Continental)

Procedure:

1. Take both blocks and place them apart from one another on top of the shaving cream. (Next page-->)
2. Using your fingers ONLY, slowly push the two blocks together. Allow the blocks to push up against each other by pushing down SLIGHTLY on the back ends of the blocks as you push them forward.
3. Increase your pressure on the blocks if necessary to make them move against each other.

DISCUSSION - PART 3

1. What happens to ends of the blocks as they move together?

2. How would the real crust plates differ from the rigid blocks when pushing against each other?

3. What feature do the resulting ends of the blocks represent?

4. Name a specific location on the Earth where this type of boundary activity takes place.

Part 4 -- Lateral (Transform) Plate Boundaries (Continental)

1. Fit two of the SAME type of wood pieces together side to side on top of the shaving cream on the wax paper.
2. Place one hand on each of the blocks and push them together by applying steady, moderate pressure. At the same time, also push one of the (---->)

pieces away from you while pulling the other toward you. If you do this correctly, the blocks should hold while you increase the push-pull pressure, but will finally break from the opposite forces.

DISCUSSION - PART 4

1. Why is this movement often described as "horizontal" sliding?

2. Name a specific location on the Earth where this type of boundary activity takes place.

3. Nothing happens at the beginning, but as the pressure is increased, the wood pieces finally slip past one another. What do we call the breaking and vibrating of the Earth's crust that this would create in real life?

Label the boundary type, types of plates (continental or oceanic), and label the direction of the plate's motion for each lab part. (All views are top views)

Part 1=

--	--

Part 2=

--	--

Part 3=

--	--

Part 4=

--	--

CONCLUSION:

1. Give an example of how plate movement directly affects the construction of Earth's surface.

2. Give an example of how plate movement directly affects the destruction of Earth's surface.

3. On the map below, Put C along convergent boundaries, D along divergent boundaries, and T along transform boundaries.

