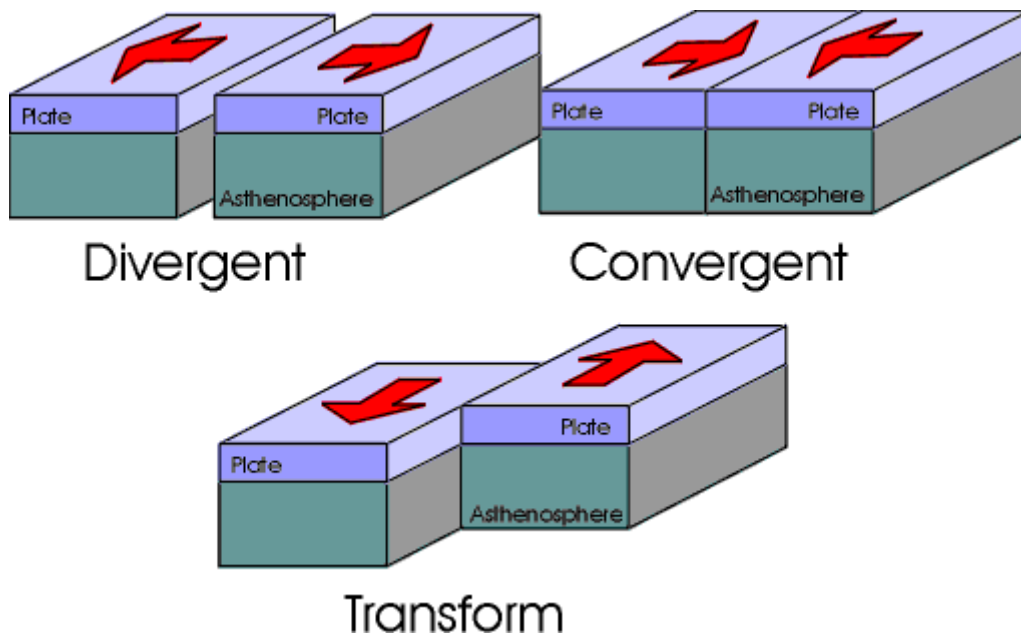


Discovering Plate Boundaries Lab (48 pts)

Goal: Students will be able to explain and justify conclusions based on data, maps, and diagrams about the formation and boundaries of geologic features due to tectonic plate movement.

Background: The Earth's outermost layer is fragmented into plates that are moving relative to one another as they sit on top of the hot, plastic mantle beneath them. The area where two plates meet is called a *plate boundary*. There are three different types of plate boundaries: *convergent* (plates coming together), *divergent* (plates moving apart), and *transform* (plates moving past one another). Scientists use data recorded from earthquakes, volcanic eruptions, age of rocks on the sea floor, and land features to determine the types of boundaries and how the plates are moving.



Directions:

You will be assigned to one of four scientific specialties and will be asked to form a group of four with the other types of scientists.

The scientific specialties are:

- A. Seismology (earthquake scientist)
- B. Volcanology (volcano scientist)
- C. Geography (land feature scientist)
- D. Geochronology (age of rocks scientist)

Each Scientific Specialty group has been provided a world map showing data relevant to classifying plate boundaries and understanding plate boundary processes.

Your objective is to use the data to classify all of the world's plate boundaries as convergent, divergent, or transform.

Part 1: What are you looking for? (10 pts)

With your group, discuss what sort of data would help you identify the boundary type. What kind of boundaries would have mountain ranges? What kind of boundaries would have deep earthquakes? Fill out the chart below with as many pieces of evidence as you can think of. Feel free to use your notes!

Boundary types	What could occur at this boundary?	
Convergent	Continental- Continental:	Oceanic-Oceanic:
Divergent	Continental- Continental:	Oceanic-Oceanic:
Transform		

Part 2: What does the data say?

Look at your group's maps and talk about what you see. Look for patterns in how volcanos and earthquakes are distributed and where the rocks are old and young. Work as a group and let everyone talk about what they see. At this point, do not try to explain the data; just observe!

Part 3: Identify the plate boundaries (30 pts)

Using your data from each scientist's map, begin to collaborate on each known plate boundary type. Do this by obtaining a laminated plate boundary map from your teacher. At each labeled boundary (A-G), **color the convergent boundaries red, the divergent boundaries blue, and the transform boundaries green.** Use dry erase marker in order to classify the boundaries on the laminated plate boundary map (in case of mistakes or disagreements). Once you have a consensus, use the chart below justify your classification of the boundaries, citing data as your evidence, and explaining your reasoning.

Plate boundary	Claim: What kind of boundary?	Evidence: What data leads you to this conclusion?	Reasoning: What process or phenomena explains this?
A			
B			
C			
D			
E			
F			
G			

Discussion questions (8pts)

1. There are many divergent plate boundaries around the world that create new crust every day, however based off observations, the Earth is not getting any bigger. Explain how over millions of years, the Earth would not expand despite these divergent boundaries.

2. The Earth is about 4.5 billion years old, but the oldest sea floor rocks are only about 180 million years old. Why are the rocks on the sea floor not older?

3. Given what you know about how the surface of the Earth changes, why would it be more useful in identifying plate boundaries to take the age from rocks on the sea floor rather than on land? Explain your reasoning.

4. Given your knowledge of Earth's interior, why are these plates moving? What is driving continental drift?
