

Discovering Plate Boundaries on Earth

Welcome to Discovering Plate Boundaries! This handout will guide you through the discovery process, where you learn about one of the great mysteries of the Earth using real scientific data!

Part 1: Assemble in four groups (posted by door) of Scientific Specialists (with your map)

Each student will be assigned to one of **Four Scientific Maps** of the Earth. The groups will then assemble around their assigned map. The members of the groups will now be considered “**Scientific Specialists**” in one of these four (4) sets of data.

1. Seismology (location and depth of earthquakes)
2. Volcanology (location of volcanoes)
3. Geography (3D surface of the Earth, both topography and bathymetry)
4. Geochronology (age of oceanic rocks on the surface of the Earth)

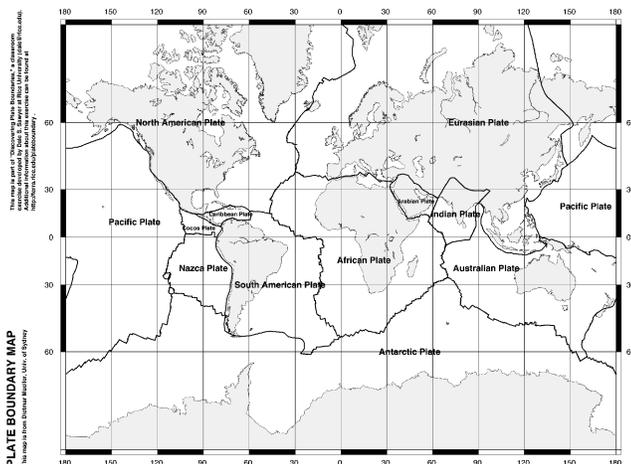
Directions Task 1 for posted groups: Look at your group's map and discuss what you see (please avoid using scientific terminology or making interpretations!). **Work as a group.** Let everyone talk about what they see. **Discuss the following and write your answers in your science journal.**

1. What sort of data are you looking at?
2. What do the different colors indicate?
3. What are some examples of extreme data points/locations?
4. What are some patterns in the data?
5. Where is the data uniform and where is it highly varied?

What you look for will vary with which group you are in (i.e., which data type). For the point data (volcanoes and earthquakes), you are looking for **distribution patterns**. For surface data (topography and seafloor age), you are looking for where the surface is high and where it is low, where it is old and where it is young, etc.

Directions Task 2: Color-code your map according to your scientific specialty using data only along the plate boundaries. Title your map and provide a key that explains your map.

Important Notes to help me explain my map:



Name _____ Date _____

Part 2: Assemble in your Plate groups.

Now we divide up into new groups, with each group assigned to a different Plate. There must be at least 4 people in each group (i.e., one person from each Scientific Specialty).

Directions Task 1: Each person (in order of seismologists, volcanologist, geographers, and geochronologist) needs to discuss their map. Include your Scientific Specialty and the classification scheme for your map. **After sharing your data, use the following guiding questions should be answered in your science journal.**

1. Look at the four maps at the same time. Which ones seem more similar?
2. Why did you choose those maps? Explain your choice.
3. Is there any map you have left out? If so, which one & why?
4. Are there similarities with that map?
5. Look closer at the maps. Look for PATTERNS between ALL the maps. List ALL the patterns below. For example, I noticed that where the ocean is deep I also see heavy volcanic activity.
6. After sharing each specialist's map with each other, what are similarities that you see?

Directions Task 2: Examine the **classifications of boundary type** for your plate based on each type of data. Are there commonalities (along the boundaries) between the different classifications? Can your plate group come up with a new classification scheme that now includes data from all four Scientific Specialties?

As above, assign a color to **represent** each of your plate boundary types. If a boundary is asymmetric, be sure to devise a way to represent the asymmetry. Each person should mark the boundaries of your plate or plate grouping using the group's color scheme on your second Plate Boundary Map. Each person should write a description of the plate boundary classifications you have used on the back of their own map. These maps and descriptions **will be turned in** at the end of the exercise.

Example of description:

Oceanic – Oceanic
Shallow earthquakes
Little volcanoes
Shallow water
New/young sea floor

