3.7 Explore

Where Are Plate Boundaries Located Across the Entire Earth?

The class will now work together to create a plate map covering Earth’s entire crust. You will begin the process by working in pairs, focusing on regions that are near yours. This way, you can determine how the plate boundaries you have identified in your region connect to those others have identified. The class will then make a plate map of the entire Earth.

Conference

Neighboring Region Meeting

The class will divide into several groups, each focused on a different area of the world. Each pair of students will be working with two or three other pairs with the same, or neighboring regions. During a Neighboring Region Meeting, you will share your plate boundaries and the evidence used to develop them with others. Together, you will come to an agreement about the location of the plate boundaries in and between your regions.

You will be using all of the earthquake data and plate boundary sketches you have collected.

1. Begin by working with the other members of your group to arrange the transparencies so that corresponding areas are in line with each other. Tape the transparencies together so they can be moved later on. You might have several sets of transparencies for each region. If so, arrange them in several combinations.

2. Each pair of students should take a turn presenting their plate boundary inferences. They should share their current maps and point out the supporting evidence. They should also show their original plate boundary maps. Supporting evidence might include data on the map or data found in My World.

Materials

- transparencies with plate boundary sketches
- Three-page Maps with plate boundaries and notes on them
- Region Project Board pages
- transparency markers
3. As each pair of students presents the maps and evidence, those who are listening should think about these questions:

- How well are they supporting their plate boundary predictions?
- Is there any data from my region that supports these predictions?
- Is there any data from my region that contradicts these predictions?
- How do the plate boundaries presented fit together with my plate boundaries?
- How do the plate boundaries presented fit together with other plate boundaries that have been presented?

If you cannot answer these questions based on a presentation, ask questions about the plate boundaries and evidence used to develop them. However, wait until everyone has presented to discuss your disagreements and to discuss how all the plates fit together.

4. After everyone has had a chance to share their predictions, discuss the patterns in the data. Do your best to come to an agreement about the way plate boundaries might connect to each other. If you have disagreements about any plate boundaries, be as specific as you can in describing where you think plate boundaries are and why. This discussion might lead you to change your plate boundaries. If so, keep track of any changes you need to make to your plate boundaries. If your group cannot come to an agreement about plate boundaries, revisit the data.

5. Make a map that shows the plate boundary lines you have agreed on. If possible, put your lines on one set of transparencies you are already working with. If the lines each group has already drawn are too far from each other for that, you may need to overlay new transparencies.

6. Be prepared to present to the class. You will need to include these points in your presentation:

- your group’s plate boundaries and the evidence that supports them
- the boundaries your group agreed on easily and why they were easy to agree on
Communicate

Share Your Plate Boundary Inferences

All groups will now present their plate boundaries to the class. During each presentation, the group should show the transparent overlays of the agreed-upon plate boundaries and plates and present the material listed. Each pair of students should discuss changes they made to their plate boundary inferences during the Neighboring Region Plate Meeting.

As you are listening to presentations, notice plates and plate boundaries that overlap your map and plate boundaries that might connect to yours. Also, make sure you understand what supporting evidence each group used to determine plate boundaries and plates and how they think their plates fit in with other plates. If a presenting group has not made these points clear, ask them questions to clarify.

Reflect

After all the groups have presented, discuss and answer the following questions:

1. Where are the places along the plate boundaries that the class is most sure about?
2. Where are the places along the plate boundaries that the class is least sure about?
3. Where are there gaps in the data? What data do you need to fill in the gaps?
4. Where are there overlaps in the plates? What evidence do you have that these plates overlap?
This discussion may lead your class back to the earthquake data again to deal with gaps or overlaps in the inferences that different groups made. Depending on the issue, it might make sense to create new neighbor plate groups and have new neighbor plate meetings. This way, groups working with plates boundaries where there are disagreements can work together to analyze the data and come to consensus.

At the end of the class discussion, you will trace the agreed-upon plate boundary zones on a new set of transparency sheets. The end product will be a plate boundary map for the entire crust of Earth. This new transparency can be placed over the Big World Map. The class has now come to consensus on Earth’s plates and the boundaries where they are interacting.

**Conference**

When the class map of Earth’s plate boundaries is completed, work with your partner to draw a map of the plates for your region. On a *Three-page Map*, mark your region and sketch the plate boundaries in and around it. Shade in the plate your Earth structure is on. Date and save these maps. You will use them later in this Unit.

Add information about the plate boundaries in your region to your *Region Project Board*. Be sure that you include any evidence you have used to support your ideas.

**Reflect**

1. Return to two earthquakes you have read about, San Francisco in 1906 and Chile in 1960. Which of these earthquakes do you think happened on a plate boundary? What evidence do you have to support your ideas?

**What’s the Point?**

By adding more data to the maps, you were able to refine your inferences about plate boundaries. It is clear from the map that there are many plate boundaries and that they are all over the world.