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**Student Exploration: Building Pangaea**

**Vocabulary:** continental drift, fossil, glacier, ice age, landmass, Pangaea, supercontinent

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

1. Antarctica is a frozen land, so cold and icy that no trees can grow there. Yet scientists have discovered **fossils** (remains preserved in rock) of ancient trees in Antarctica.

What do you think this means? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. The Himalayas in central Asia are the tallest mountains in the world. But fossils of seashells can be found high in these mountains, far from any ocean.

How do you think they got there? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**ACTIVITY A: Fossil and Rock Evidence**

**Question: What do fossils and rocks tell us about Pangaea?**

1. Observe: The brown areas in the Gizmo show where fossils of *Lystrosaurus* have been found. *Lystrosaurus* looked a bit like a dinosaur, but lived in a time before dinosaurs.
	1. On which modern continents did *Lystrosaurus* live?
	2. *Lystrosaurus* probably couldn’t swim very far. How might the locations of *Lystrosaurus* fossils be seen as evidence that the continents were once together?
2. Explore: Use the fossil evidence to help you make a map of Pangaea. How well do the landmasses fit together? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Revise: Now under **Evidence** choose **Rocks**. The purple areas are mountains that formed when landmasses collided 450 million years ago. The orange areas show rocks that formed about 2 billion years ago. Adjust your map using this evidence.
4. Extend your thinking: Click **Reset** and watch India closely. The Himalayan Mountains are found on the border of India and Eurasia. How do you think these mountains were formed?

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**ACTIVITY B: Glacier Evidence**

**Introduction: Glaciers** are large, slow-moving sheets of ice. During **ice ages**, glaciers formed at the North and South Poles and spread out to cover large areas.

**Question: What does evidence of glaciers tell us about Pangaea?**

1. Observe: The white areas are places that show evidence of a massiveice sheet that existed around 250 million years ago.
	1. Which landmasses show evidence of ancient glaciers?
	2. Would you expect to find large glaciers on all these landmasses today? Explain.
2. Explore: Drag the landmasses together to form a map of Pangaea. Try to line up the white areas on each continent. Use the fossil and rock evidence as well if you like. Sketch your final map in the space provided.
3. Analyze: Choose **Glaciers** (if necessary) and look at the white regions. Does this pattern make more sense now? Explain.
4. Extend your thinking: As glaciers moved away from the poles, rocks stuck to the bottom of the ice were dragged over the ground. This left scrapes and scratches on rock outcrops that can still be seen today. The scratches show which direction the glaciers moved.
5. Look at the arrows that show the direction of glacial scratches. What is the pattern?

1. Which landmass do you think was located over the South Pole in the time of Pangaea? Why?