**Piecing Together a Supercontinent Activity**

How can you use data from the continental shapes and the distribution of fossils and rocks to provide evidence of plate motions of the past?

Background

If you have ever looked at a world map you may have noticed that the outlines of South America and Africa seem to fit together like pieces of a jigsaw puzzle. Do you think this observation is a coincidence? Or do you think the outlines of the continents might provide evidence that South America and Africa were once joined together? In this activity, you will explore evidence for the past positions of Earth’s continents.

Procedure:

1. Study your world map. Notice the rectangles that are drawn on the map. Each rectangle shows a general area where specific fossils or rock formations are found. Notice that each rectangle also has a number in it. The number refers to the type of rock formation or the type of fossil found in the general area of the rectangle. Look at the Map Key below to identify which numbers correspond to each type of rock formation or fossil.

|  | Map Key | | |
| --- | --- | --- | --- |
|  | Number ID | Evidence | Color Code |
|  | 1, 8, 9, 10, 3 | Coal beds | Yellow and black |
|  | 2, 4, 7, 13 | Folded mountains (mountain faces that exhibit broad, colored bands of rocks) | Brown |
|  | 5, 12, 15, 18, 19, 20 | *Glossopteris* fossils (fossils of a woody, fern-like plant that flourished until about 245 million years ago) | Green |
|  | 11, 14, 17, 21 | *Lystrosaurus* fossils (fossils of a pig-like reptile that existed about 250 million years ago) | Orange |
|  | 6, 16 | *Mesosaurus* fossils (fossils of a crocodile-like reptile that lived about 240 million years ago) | Purple |

1. Work with your partner to select a color for each type of rock formation or fossil. Then use the number IDs in the Map Key to color each rectangle of the map.
2. After you have finished coloring your map, cut out the continents along the coastlines.
3. Try to arrange the continents so that they fit together. You may use the outlines of the continents as your guide. You may also use your color-coded rectangles as guides by lining up rectangles on one continent with rectangles of the same color on another continent. *(Hint: Try arranging South America and Africa first.)*
4. Glue your continents into one new “supercontinent” on a blank piece of paper.

Analyze and Interpret Data:

1. **Cite Evidence** Look at your supercontinent. Which rock formations or fossils indicate that South America and Africa were once connected to each other? Mesosaurus fossils indicate that South America and Africa were once connected to each other.
2. **Construct Explanations** Select two continents that you joined together, other than South America and Africa. Construct an explanation describing the evidence that indicates that these two continents were once joined. Antarctica and Australia might have been together because they have a perfect matching piece for them to be one continent.
3. **Synthesize Information** Look at your map. Notice that fossils of *Glossopteris* are found in Antarctica. *Glossopteris* flourished in hot, dry climates. What does this characteristic suggest about the climate of Antarctica 245 million years ago? It could have been hot and not icy like it is now and other creatures could have lived there.
4. **Interpret Data** Look at your answer to the previous question. What does your answer suggest about the location of Antarctica 245 million years ago? Antarctica probably was with Australia which would make it the same temperature and the animals would have been different and the oxygen too.
5. **Apply Concepts** *Lystrosauri* had stocky bodies.The stocky form suggests that these animals were probably poor swimmers*.* Look at your map. Locate the areas where *Lystrosaurus* fossils are found. Assuming these animals were poor swimmers, how do fossils of *Lystrosaurus* provide evidence that continents were once joined together but later broke apart? It is because the fossils are scattered all over the place so the continents were maybe once together but when the continent split the fossils were split into many different continents.
6. **Interpret Data** Compare the distribution of the coal bed locations before and after you pieced together the continents. How would you describe the distribution of coal beds in the current world map? How would you describe the distribution of coal beds in your supercontinent? In the current world map the coal beds are all scattered but in my world map they would be in one really big continent and it would be easier to get to the coal beds.
7. **Connect to Nature of Science** Up until the mid-1900s, many scientists believed that Earth’s continents have always been where we see them today. Data such as the evidence you have studied in this investigation began to convince scientists that they needed to revise their theory. What other information do you think scientists needed before revising their long-held theory that Earth’s continents do not move? They need to look at a map and look if any of them could fit in another continent, they need to research more carefully, make predictions, hypothesizes, find out all information they can, and they need to know what has happened over the years and what do they notice that has changed about the world map.