

# 40 The Continent Puzzle



**V**olcanoes occur all over the world. How likely is it that volcanic eruptions will occur at Yucca Mountain? To answer this question, it helps to study the past. You will find out more about the history of the earth in the next few activities.


In the early 1900s, Captain Robert Scott, who was from England, explored the continent of Antarctica. In his journal, he described finding plant fossils. These fossils were later identified as *Glossopteris* (gloss-OP-ter-iss), an extinct fern-like plant that grew on earth about 250 million years ago. *Glossopteris* grew in warm, wet areas, and could not have survived in an extremely cold place like Antarctica. How did the fossils of this plant end up in Antarctica?

## CHALLENGE

What can rearranging the continents tell you about earth's history?








*Captain Robert Scott's campsite in Antarctica.*

MATERIALS	
	<p>For each group of four students</p> <ul style="list-style-type: none"> <li>1 set of 7 “World Puzzle” pieces</li> <li>1 Student Sheet 40.1, “Earth’s Surface Through Geological Time”</li> </ul>
	<p>For each student</p> <ul style="list-style-type: none"> <li>1 completed Student Sheet 39.1, “Ordering Events”</li> </ul>

## PROCEDURE

### Part A: The World Puzzle

1. With your group, carefully examine the location of the world’s continents on the map on the next page.
2. Record the names of the seven continents in your science notebook.
3. Compare each World Puzzle piece to the continents on the map. Put a star next to each continent in your list that is represented by a puzzle piece. Then record the name(s) of any additional pieces.
4. Work with your group to arrange your puzzle pieces in locations similar to the ones shown on the world map.
5. Look at the symbols on some of the pieces. The symbols represent types of fossils or rocks found in several locations. The key to these symbols is shown below.

Key to Symbols on World Puzzle	
	<i>Glossopteris</i> , an extinct fern-like plant that could grow to 3.7 meters (12 feet) in height
	<i>Mesosaurus</i> (MESS-oh-saw-rus), an extinct freshwater reptile about 0.5 meters (2 feet) in length
	<i>Cynognathus</i> (sy-nog-NAY-thus), an extinct land reptile about the size of a wolf
	<i>Lystrosaurus</i> (liss-tro-SAW-rus), an extinct land reptile about 1 meter (3 feet) long
	Mountain ranges that have similar rock layers



**Continents of the World**  
*The country of India can be seen on the Asian continent, in orange.*

6. Work with your group to try to place all of the puzzle pieces into a single shape. Work together to decide where each piece belongs.

Remember to listen to and consider the explanations and ideas of the other members of your group. If you disagree with other members of your group, explain why you disagree.

7. In your science notebook, sketch an outline of the final shape of your completed puzzle. Then, draw and label the individual puzzle pieces within your outline.
8. Move the pieces back into positions similar to the location of the continents today. Then slowly move the pieces back together into the single shape.
9. Discuss with your group what this puzzle might tell you about the history of the earth.

### Part B: The History of Earth's Surface

10. Ask your teacher for a copy of Student Sheet 40.1, "Earth's Surface Through Geological Time," for your group.
11. Discuss with your group what you think has happened to the land on the surface of the earth during geological time.
12. Compare the outline that you sketched in Step 7 with Student Sheet 40.1. Identify when in earth's history the continents were arranged in a similar way. Record this time period, and the name of the land at this time, next to your sketch.

## ANALYSIS



1. Describe what has happened to the land on the surface of the earth over the past 425 million years.
2. There are seven continents and there were seven puzzle pieces. But not every puzzle piece represented a continent. Why do you think this is? **Hint:** Think about how you used the pieces to model changes on the earth's surface.
3. What types of evidence did the puzzle provide about change on the earth's surface?



4.
  - a. Look at the information in Table 1, "Approximate Time Period of Some Extinct Organisms." On Student Sheet 39.1, "Ordering Events," record when each of these organisms lived.
  - b. Pangea began to break apart about 200–225 million years ago. Record this event on Student Sheet 39.1.
  - c. Which of the extinct organisms listed in the table below lived on Pangea before it broke apart?

Approximate Time Period of Some Extinct Organisms	
Extinct Organism	Lived
<i>Glossopteris</i> (plant)	206–250 million years ago
<i>Mesosaurus</i> (reptile)	248–280 million years ago
<i>Cynognathus</i> (reptile)	230–245 million years ago
<i>Lystrosaurus</i> (reptile)	206–248 million years ago



## EXTENSION

Go to the *Issues and Earth Science* page of the SEPUP website to link to animations showing the movement of continents over the last several million years. What do you notice?