The Shifting Globe

Objectives:

- Students will understand how landmasses on the Earth have moved considerably over the Earth's history
- Students will review map projections
- Students will review important features of the globe, including the Arctic and Antarctic Circles, the Tropics and the Equator

Materials:

- 3 ten-inch beach balls per group
- 1 overhead projector marker per group
- 3 sets of continent outlines per group
- scissors
- tape
- 1 globe per class
- paper towels
- Map of current plate boundaries with direction of motion

The Shifting Globe: Pangaea to Modern Times

The goal of this activity is to create a map on a beach ball showing the Earth when Pangaea was assembled, and where the continents are today.

1. Take three beach balls. Mark on the balls, using a washable marker:
    a. North Pole
    b. South Pole
    c. The Equator
    d. Tropic of Cancer
    e. Tropic of Capricorn
    f. Arctic Circle
    g. Antarctic Circle

2. Begin by having the students put the continents on today's globe. They may use a standard globe as a reference and have them check their accuracy.

3. With an overhead marker, the students will carefully draw the plate boundaries. They should clearly show the difference between the different types of plate boundaries.

4. Ask the students to predict how today's continents can be put together to create Pangaea. What clues give them evidence as to what choices they would make? Discuss this with the students. Emphasize how not only coastline but sea floor spreading and subduction can be used as clues.

5. Hand out maps of Pangaea that show not only the shape of the continent, but its position and orientation on the globe.

6. Challenge the students to put the continents together in the proper shape, and to place it properly on the globe. Discuss what they have learned from this activity.

What's the Future Hold?

Using the globes they have already created, and the maps provided, the students make predictions of the future Earth 250 million years from now.

1. Make 5 specific predictions about what the Earth might look like. For each prediction, provide supporting evidence.

   Questions for the students to consider:

   a. Where might continents smash into each other?
   b. Where might sea floor spreading or subduction zones be happening?
   c. Where might the continents be located?
   d. Where might new mountain ranges be formed?

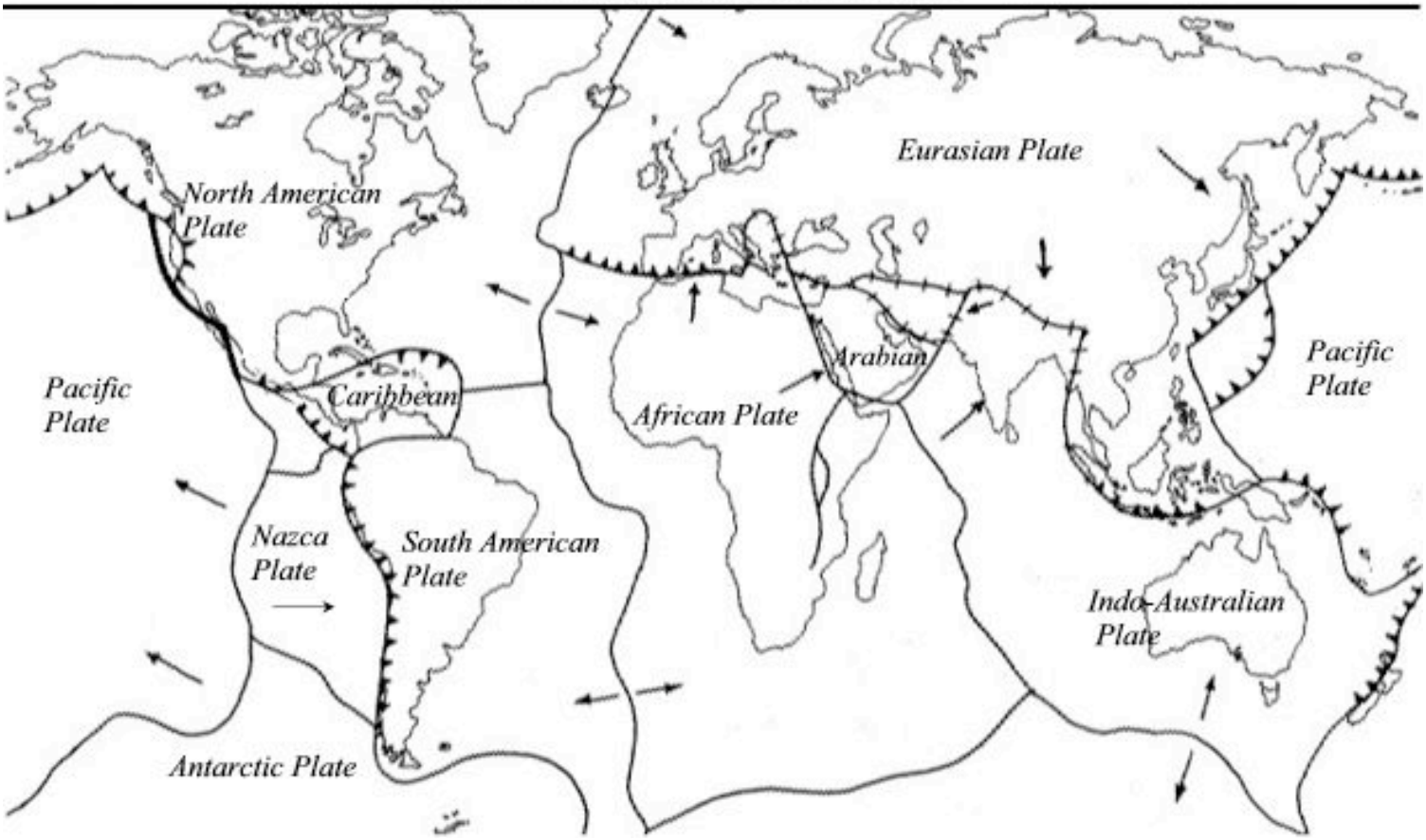
2. Using the 3rd beach ball, students place the continents properly according to their predictions.

3. Using the globe created, sketch a 2-D map on a blank map grid.

4. Present the globes and maps to the class. This could be done as a group presentation to the whole class or as a "Museum-type" walk. Regardless, the emphasis of the presentation should be on showing evidence to support their predictions.

Major Plate Boundaries

The earth's crust is broken up into a series of plates.



KEY

Convergent Plate Boundary (Subduction Zone)

Divergent Plate Boundary (Sea Floor Spreading and Rift Valleys)

Direction of Plate Movement

Convergent Plate Boundary (Continental Collision Zone)

Transverse Plate Boundary (Slip-Strike Boundary)