

Name \_\_\_\_\_

## Modeling El Niño

**Purpose:** To model the formation of an “El Niño” weather event.

**Background Information:** El Niño is the name given to weather events that occur in a cyclic pattern. It is an abnormal warming of surface ocean waters in the eastern tropical Pacific Ocean. This causes a temporary change in climate around in the region. Usually, the wind blows strongly from east to west along the equator in the Pacific. This actually piles up water in the western part of the Pacific. In the eastern part, deeper water (which is colder than the sun-warmed surface water) gets pulled up from below to replace the water pushed west. So, the normal situation is warm water (about 30 C) in the west, cold (about 22 C) in the east.

During El Niño, the winds pushing that water weaken. Because of this, some of the warm water piled up in the west slumps back down to the east, and not as much cold water gets pulled up from below. Both these tend to make the water in the eastern Pacific *warmer*.

- The coldest ocean water is most dense and stays at the bottom of the sea. It contains the most nutrients for living things.
- Living things need light and must live at the oceans surface.
- Usually, the normal, or prevailing, winds blow surface water away from the coast and draw up colder nutrient rich water from the bottom. Schools of fish are attracted to the plankton that quickly grows there.
- During an El Niño year, the winds die or blow randomly and the water is not drawn up.

### Materials:

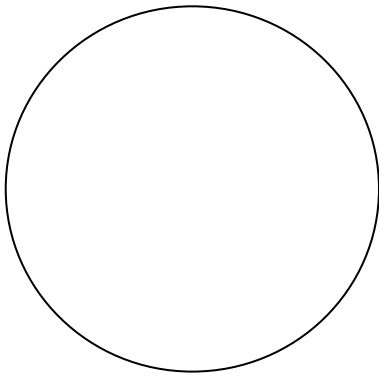
Clear glass pie plate	1 beaker cold salty water with blue food coloring added	1 beaker warm fresh water with red food coloring added
Turkey baster	Map pencils	

### Procedure:

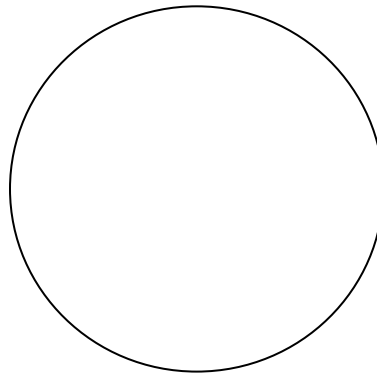
1. Carefully pour about 2cm of warm water about 2cm in the pie plate.
2. Use the turkey baster & draw up the cold, salty water.
3. Place the tip of the baster on the bottom of the pie plate, **under** the warm water.
4. **Slowly** squirt the cold, salty water in the baster into the dish. Keep adding cold water until it is as deep as the warm water. The result should be a two layer system of water. Diagram this system below:

5. Blow across the top surface near an edge of the pie plate.
6. Observe the top of the pie plate. Record your observations.

**Data:** Pie plate from the top:



Before blowing



After blowing

**Data Analysis:**

1. What happens to the ocean as wind blows across the surface?
2. What would happen to the ocean if the wind didn't blow?
3. Draw a diagram using arrows to show what happens to the ocean and atmosphere on a normal year:

**Questions & Conclusion:**

Answer using complete sentences.

1. Why is the coldest, saltiest water on the bottom of the ocean?

2. Why is cold water coming to the surface important?

3. What happens to air over warm ocean water?

4. What would the above air mass do when it reaches land?

5. How does El Niño affect you?