Name _____ Period _____ Date _____

Your Progress:

- Mastery
- Proficient
- Developing
- Beginning

Lesson 2: What Happens When Air is Heated or Cooled?

Activity 2.1

Purpose

Today we are making a model to help us understand what happens when air on the Earth is heated and cooled. You are going to make a closed system with a glove over a bottle.

Word Wall Words

Updraft: _____

Downdraft: _____

✚ Safety

Take caution not to touch the hot plate or hot water as it may cause severe burns to skin.

Prediction

You will heat the bottle by putting it in a dish of very hot water. Then you will cool the bottle by placing it in a bowl of ice. Predict what will happen to the mass and volume of the system when it is heated or cooled.

	The mass of the system will:	The volume of the system will:
When place in hot water…		
When placed in cold water…		

Procedure

1. Place the glove over the bottle and pull it down until the top of the bottle fills the palm of the glove.
2. Weigh the bottle with the glove. **Record** the mass under "At Room Temperature (Before)".
3. In the chart, **describe** what the glove and bottle look like before you begin.
4. Stand the bottle in the beaker of hot water. Let the bottle sit for two minutes. You may need to gently push the bottle down and hold it there. Do let the water overflow!
5. **Record** your observations in the chart under "After Heating".
6. Remove the bottle from the hot water and immediately place it into the ice water bath two minutes.
7. **Record** your observations in the chart under "After Cooling".
8. Remove the bottle from the ice-water bath. Allow the bottle to return to room temperature. Dry the bottle off. Weigh the bottle and glove again. **Record** this mass under "At Room Temperature (After)". Be sure to **describe** what the room temperature bottle and glove look like too.

Data

	At Room Temperature (Before)	After Heating	After Cooling	At Room Temperature (After)
Description of the Bottle				
Description of glove				
Mass of glove and bottle				

Making Sense

Create a model to show what happened to the air particles in the bottle and the energy. Your model should show what happened to the matter and energy when the bottle was heated and then when it was cooled. Include:

- The bottle, glove, heat source and ice bath.
- The arrangement of air molecules in the bottle and the glove.
- Arrows to show the movement and speed of air particles.

Room Temperature:	Heated:	Cooled:

How does this experiment with the bottle and glove, compare with the demonstration with the lighter and ice?