Name _____

Bobbie Jo Williams

Learning the Scientific Method

Directions- Carefully read the problem below. Using the scientific method write up a lab report. Make sure you gather information and based on the information gathered, form a hypothesis or an educated guess, on what you think the solution could be. After gathering data and forming your hypothesis, come up with an experiment that the whole class can do to test your hypothesis. But before the class can do it you must perform the experiment and record and analyze all your data. After which you will form a conclusion based on your experiment. Have fun and be creative!

Problem- Emma got a new basketball for her birthday. She played with it all day long. When her mom called her in for dinner she left her ball outside. When she woke up in the morning and went back out to play with the ball it was flat. Why was Emma's basketball flat in the morning?

1. State the Problem:

Why did Emma's basketball go flat when it was left outside over night?

2. Gather Information on the problem:

Warmer temperatures cause air molecules to move faster and colder temperatures cause air molecules to move slower. When molecules are moving slower they condense, and when they are moving faster they expand.

3. Form a hypothesis based on your data.

Based on the information above, I believe the basketball went flat because the air molecules inside it slowed down and compressed due to the decrease in temperature. If the ball was to be brought back inside where the temperature is warmer the molecules would speed up and expand creating the ball to inflate.

4. Create an Experiment to test your hypothesis. Remember to make sure you use the same amount of water at the same temperature each time. (If you need more steps use another sheet of paper)

Materials:

2 beakers
Thermometer
Warm water
Water
Balloon
Ruler
String
Ice

Step 1:
Fill the first beaker with warm water, and fill the second beaker with ice water. Record the temperature of both beakers.

Step 2:
Fill the balloon with air and measure the circumference (distance around the balloon). Record this distance.

Step 3:
Insert the balloon into the ice water and measure the circumference of the balloon once it has shrunk. Then insert the balloon into the warm water and again record the circumference of the balloon. After performing this experiment read over your data and explain why you think this happened?

5. Record and analyze all of your data. Use the space below to make charts, or graphs to help you visualize.

<u>Temperature</u>:
Ice Water Temperature: 45

Warm Water Temperature: 88

<u>Circumference (distance around the balloon):</u>

At room temperature: 12in.

In Ice Water: 10in.

In Warm Water:

6. Based on your data above form a conclusion and state whether or not your hypothesis is correct.

Based on the experiment and data collected above the basketball went flat because when the ball was left outside the temperature dropped making the air molecules condense.