**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Scientific Method Lab**

1. The purpose of this lab is to use the Scientific Method to solve a problem.

 A) Observe and ask questions that lead to a problem

 B) Form a hypothesis

C) Test the hypothesis with a controlled experiment by making observations and gathering data.

D) Analyze gathered data

E) Reject or Accept your hypothesis

F) Form a conclusion

2. Materials

 2 small pieces of wax paper

 1 meter long piece of string

 1 meter stick

 2 different pieces of bubble gun labeled A and B

3. **READ directions carefully before starting the lab**. Each group will need one piece of gum labeled A and one labeled B. Make 3 observations about each brand of gum.

**Observations**

 Brand Name A:\_\_\_\_\_\_\_\_\_\_\_\_ Brand Name A:\_\_\_\_\_\_\_\_\_\_\_\_

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Problem: Which piece of bubble gum blows the biggest bubble?

Hypothesis: Predict which piece of gum will blow the biggest bubble and why.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Procedure:

1. The person with brand A will chew their piece of gum for **3 minutes.** The **person with brand B does not begin chewing** until all the tests on brand A are

completed.

 2. Blow a bubble.

3. Using a string, your partner will measure the diameter (distance across) the bubble. Put the string on the meter stick to measure the distance in centimeters (cm).

4. Record the measurement in a data table. Repeat the process for trials 2 and 3.

5. Find the average bubble size for brand A (add all the distances up and divide by 3) and put in the data chart.

 6. Repeat steps 1-5 with brand B gum.

Data Table: Fill in the Data Table

| **Brand** **A:\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **Trial** | **Diameter in cm (distance across the bubble)** |
| --- | --- | --- |
|  | Trial 1 |  |
|  | Trial 2 |  |
|  | Trial 3 |  |
|  |  | **Average (Trial 1+Trial 2+Trail 3) =** **3** |

| **Brand** **B:\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **Trial** | **Diameter in cm (distance across the bubble)** |
| --- | --- | --- |
|  | Trial 1 |  |
|  | Trial 2 |  |
|  | Trial 3 |  |
|  |  | **Average (Trial 1+Trial 2+Trail 3) =** **3** |

Conclusion: Forming a theory

 What brand of gum is the best at blowing bubbles and why? Support your answer with observations and your data.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**PART 2**

Combine with another group to complete this part of the lab.

Problem: How does gum “strechability” relate to bubble size?

Hypothesis: Make an educated guess that would answer the above question.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Procedure:

 1. The person with brand A will roll their gum into a ball.

2. Hold the gum (brand A) by using the piece of wax paper. Another person in the group would hold the same piece of gum with another piece of wax paper. Hold the gum near your chest, begin to walk slowly backwards.

3. The third person in the group should hold the meter stick and measure the distance in centimeters the gum stretched before breaking.

 4. Record the measurement in the data chart. ONLY DO ONE TRIAL

 5. Repeat #1-4 for brand B gum.

Data Table: Create a data table to fit the data you will be gathering

|  | **Distance (in cm) the gum stretched before breaking** |
| --- | --- |
| **Group 1 Brand** **A:\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |  |
| **Group 1 Brand** **B:\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |  |
|  **Group 2 Brand** **A:\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |  |
| **Group 2Brand** **B:\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |  |

Conclusion:

 COMPARE DATA FROM BOTH GROUPS IN PART 1 AND PART 2

How does gum stretchability relate to bubble size?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

With your lab partner, list 2 sources of error that may affect the outcome of this experiment.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explain how the data you collected can be described as both qualitative and quantitative

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

List any questions you still have about the scientific method.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_