Name_____

Gummy Bear Science

Purpose: To practice using a *fair test* as a controlled experimental investigation. To learn to **communicate results so that** they can be understood by others.

Background Information: There are different types of scientific investigations. The question the scientist is trying to answer determines the type of investigation that is used. One type of investigation that is used is the *controlled experiment*. Controlled experiments have ***variables***. Variables are things in the experiment are or could be changed. There are three kinds of variables. It is important to know and understand each type.

- Independent variables (also called manipulated variables) – this is changed by the scientists on purpose
  - Single factor in an experiment that the scientist chooses to change
  - The difference between the groups
  - The 'cause' of a change
  - When something is observed or measured over a period of time, TIME is
  - the independent variable
- Dependent variable (also called responding variable) – this variable responds to the independent variable
  - The effect caused by the independent variable
  - What is observed
  - What is measured
  - The data
- Controlled variables (also called constants) – things in the experiment that are kept the same
  - Things that could change, but don't
  - Kept constant by the scientist
  - Allow for a fair test

Think about this: What will happen if a Gummy Bear candy is left in a cup of water overnight? What will happen if different types of water are used?

Question: How is a Gummy Bear affected by soaking in different types of water?

Hypothesis: If _____, then _____.

Materials:

Gummy Bear candy	Tap water	Distilled water	Salt water
Beaker	Metric ruler	Masking tape	Paper towel

Procedure:

1. Work with a partner.
2. Your teacher will assigned you a specific type of water to use.
3. Fill your beaker half full with the type of water you have been assigned.
4. Use the masking tape to label your beaker with the type of water and your names.
5. Record your qualitative observations of your Gummy Bear in the data section.
6. Use the ruler to find the length of the Gummy Bear in mm. Record the length in the data chart.
7. Record the length of the other Gummy Bears in your water type group.
8. Put the Gummy Bear in the beaker of water and let it soak overnight.
9. After soaking, record your qualitative observations in the data section.
10. VERY CAREFULLY, remove the Gummy Bear from the water and place it on the paper towel.
11. Use a metric ruler to find the length in millimeters. Record your data.
12. Record the average data for each type of water.

Data:

GUMMY BEAR OBSERVATIONS	
Before Soaking	After Soaking

CHANGE IN GUMMY BEAR LENGTH IN MILLIMETERS			
Type of water:			
	Starting Length	Length after Soaking	Difference
Gummy Bear 1			
Gummy Bear 2			
Gummy Bear 3			
Gummy Bear 4			
Average			

Class Data:

AVERAGE CHANGE IN LENGTH	
Distilled water	
Tap water	
Salt water	

Data Analysis:

Make a bar graph to display the before and after averages for each type of water.

What does the graph need so that other scientists can understand your data?

_____

_____

_____

What does the graph display? _____

What does it tell you about results of the investigation?

_____

_____

Questions:

1. What was the **independent variable** in this investigation? _____
2. What was the **dependent variable** in this investigation? _____
3. What were two **controlled variables** in this investigation?

   _____

4. Why did we take an average of the data?

   _____

   _____

5. Why is a bar graph a good choice to display this type of data?

_____

_____

_____

Conclusions: Write a short paragraph, using complete sentences and appropriate grammar and spelling to describe what you learned about soaking Gummy Bears in different types of water. Did the data support your hypothesis?

_____

_____

_____

_____

_____

_____