**Gummy Bear Osmosis**

**Hypotheses:** Circle your choices to create your hypotheses **(2 points)**

**1.** If the H2O concentration in tap water is **(higher , lower)** than the H2O concentration in a Gummi Bear, then Gummy Bears placed in tap water will **(increase, decrease, remain the same)** size**.** Circle your answer.

**2.** If the H2O concentration in distilled water is **(higher , lower)** than the H2O concentration in a Gummi Bear, then Gummy Bears placed in distilled water will **(increase, decrease, remain the same)** size**.** Circle your answer.

**Materials: for pairs of students**

1 cup

Marker

2 – plastic forks

Waxed paper or Foil

3 - Gummy Bears (different colors)

distilled water

saturated salt solution (6 oz per cup)

centimeter rulers

**Safety Considerations:**

There are no safety hazards with materials used in this experiment.

**Procedure:**

Day One

1. Obtain one cup, three different colored Gummy Bears and a ruler.

2. Label your cup with a marker. Label your names, and class block.

3. Measure your bear (in cm) from top to bottom (length) and from side to side (width) and from front to back (height).

4. Record the dimensions in centimeters in the data table. Use decimals.

5. Calculate the volumes of the bears- record in your data table.

6. Using the scale, find the mass of each bear. Record the mass in the data table in grams. Again, use decimals.

7. Place the bears in the cup.

8. Cover the bears with distilled water. Do not fill the cup all the way- just enough so that the bears are covered with a little extra water on top!

9. Place your cups in the designated area.

10. Let them sit overnight.

Day Two

1. Gently scoop the bears out of the cup using the fork- they are really fragile BE CAREFUL NOT TO BREAK THEM!

2. Place on paper towel or waxed paper. Carefully blot the bear dry with paper towel.

3. CAREFULLY Measure the length, width, and height. Record in your data table.

4. Calculate the volumes of the bears- record in your data table.

5. Using the scale, carefully find the mass of the bears. Record in your data table.

6. Place the bears back into the cup.

7. Cover the bears with saturated salt solution. The bears should be completely covered – cup about half full. Let them sit overnight.

Day Three

1. Gently scoop the bears out of the cup using the fork- they are really fragile BE CAREFUL NOT TO BREAK THEM!

2. Place on paper towel or waxed paper. Carefully blot the bear dry with paper towel.

3. CAREFULLY Measure the length, width, and height. Record in your data table.

4. Calculate the volumes of the bears- record in your data table.

5. Using the scale, carefully find the mass of the bears. Record in your data table.

6. Throw away the bears, cups, and other trash. Keep the plastic forks and put them in designated area.

7. Complete the analysis questions.

**Questions: Use appropriate vocabulary to help you answer the questions.**

1. Describe what happened to the bears when they were placed in distilled water. Explain why this change occurred.
2. Describe what happened to the bears when they were placed in the salt solution. Explain why this change occurred.
3. If we were to have placed the bears back into distilled water after the 3rd day, make an inference as to what would have happened. Explain your reasoning.
4. Write a narrative from the perspective of the gummy bear that explains the results of this experiment. Use the concepts of osmosis and data from your lab to support your answer.



Distilled Water Salt Solution

Data Table for VOLUME:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Gummy Bear 1 Color:** | | | **Gummy Bear 2 Color:** | | | **Gummy Bear 3 Color:** | | |
| **Dimensions** | **Initial**  **(day 1)** | **After Distilled Water**  **(day 2)** | **After Salt Solution**  **(day 3)** | **Initial**  **(day 1)** | **After Distilled Water**  **(day 2)** | **After Salt Solution**  **(day 3)** | **Initial**  **(day 1)** | **After Distilled Water**  **(day 2)** | **After Salt Solution**  **(day 3)** |
| **Length(cm)** |  |  |  |  |  |  |  |  |  |
| **Width (cm)** |  |  |  |  |  |  |  |  |  |
| **Height(cm)** |  |  |  |  |  |  |  |  |  |
| **Volume (cm3)**  **L x W x H** |  |  |  |  |  |  |  |  |  |

Data Table for MASS:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Gummy Bear 1 Color:** | | | **Gummy Bear 2 Color:** | | | **Gummy Bear 3 Color:** | | |
| **Mass (grams)** | **Initial**  **(day 1)** | **After Distilled Water**  **(day 2)** | **After Salt Solution**  **(day 3)** | **Initial**  **(day 1)** | **After Distilled Water**  **(day 2)** | **After Salt Solution**  **(day 3)** | **Initial**  **(day 1)** | **After Distilled Water**  **(day 2)** | **After Salt Solution**  **(day 3)** |
| **Gummy Bear Mass** |  |  |  |  |  |  |  |  |  |

**Analysis:**

Calculate the percent changes in volume after each step of the experiment.

**% change of mass= (Final Mass – Initial Mass)/ Initial Mass x 100**

Data Table for PERCENT CHANGE OF MASS

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Gummy Bear 1** | **Gummy Bear 2** | **Gummy Bear 3** |
| **After Distilled Water** |  |  |  |
| **After Salt Solution** |  |  |  |

Make a BAR graph to show the percent change of mass for each gummy bear.

* Give the graph a title.
* Label the axis.
* Use an appropriate scale.
* Place the data for all bears on the same graph (3 bars for each change)
* If you have a negative value, make sure to start your graph with a negative number.
* Color code the bars to correspond to the color bears you had.