| Unit 1 | Handout _____ | *Lesson 5: Osmosis and Gummy Bears* |

**Purpose:** To observe how osmosis affects gummy bears (hey, why not?)

**Research/Background**:
Osmosis is a natural process that involves the diffusion of water. Diffusion is when particles move from an area of high concentration to an area of low concentration. Its effects can be seen in all organisms and in some abiotic factors. To understand osmosis, you will conduct a simple activity demonstrating its effects.

**Procedure**
**1.** Collect as much <u>quantitative data</u> as you can about your gummy bear.

| Measurement | Value (unit) |
|---|---|
| Mass | 2.3 g |
| Length | 1 cm |
| Width | 1 cm |
| Height | 2 cm |
| Volume (L x W x H) | 2 cm³ |

Note: your data may vary from mine. Don't worry if it doesn't match exactly!

**2.** Make at least two predictions about what will happen to the gummy bear. Your predictions **must** be about your data you have collected. Be as specific as possible (i.e.: don't say "it'll get bigger.") Write your predictions on the next page. Then, explain why you think your prediction is true.

| Prediction | My explanation |
|---|---|
| I predict that the mass of the gummy bear will increase. | Both of my predictions are supported by the same observation: the gummy bear has a lower concentration of water than the solution it will be placed in. Since this is true, the water should osmosis from the solution and into the gummy bear. This should cause in increase |
| I predict that the volume of the gummy bear will increase. | |

**3.** Place your gummy bear in the water and clean up your area around you.

$$\frac{3.5}{4}$$
$$2.0$$
12

## Post-Lab

1. Retrieve your gummy bear and re-record your data in the tables below. Note any differences between your original data and the new data.
   This is only sample data and may not match yours!

| Measurement | Starting Value | Ending Value | Difference? |
|---|---|---|---|
| Mass | 2.3 g | 13.8 g | + 11.5 g |
| Length | 1 cm | 2 cm | + 1 cm |
| Width | 1 cm | 2 cm | + 1 cm |
| Height | 2 cm | 3.5 cm | + 1.5 cm |
| Volume | 2 cm³ | 14 cm³ | + 12 cm³ |

2. At the beginning of the lab, what had the **higher** concentration of water: the solution or the gummy bear? __Solution__

3. At the beginning of the lab, what had the **lower** concentration of water: the solution or the gummy bear? __Gummy bear__

4. Use the following words to complete this sentence: **solution** and **gummy bear.** In this lab, the water moved from the __Solution__ to the __Gummy bear__.

5. How did the gummy bear change? Cite specific data from your investigation.
   The mass and volume of the gummy bear increased. Based on my data, the mass increased by 11.5 g and the volume increased by 12 cubic centimeters.

6. Was the gummy bear placed into a hypertonic, hypotonic, or isotonic solution?
   Hypotonic

7. Explain how you know your answer for number 6.
   I know the solution is hypotonic because the mass and volume of the gummy bear increased. The increase is from water moving from the solution and into the gummy bear. This happened because the solution had a higher concentration of water than the gummy bear. Therefore, the water osmosed from the solution and into the gummy bear causing the observed increases. This meets the definition of a hypotonic solution.