Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_

**Lab: What’s in the bag?**

**Diffusion** is the *movement of particles from a region of high concentration to a region of low concentration.* That’s why you can smell someone’s perfume down the hallway, when your Mom is baking in the kitchen, or when the garbage needs to be taken out! The particles you smell have moved form their original place to your nose!

The specific type of diffusion where molecules of water pass through a semi-permeable membrane is known as **osmosis**. This process occurs everywhere in your body, between your cells and your blood. Certain substances can pass from your blood to different cells in your body, and from your cells back into your blood. These substances can be hormones, waste products, glucose, amino acids, etc.

**But how do “right” things stay in your cells and the “right” things leave your cells?**

**Answer:** Depending on their **size and their concentration**, substances can move past a **semi-permeable membrane**, which is what all of our cells are surrounded by. If a molecule such as water is small enough, it can pass from an area of higher concentration to an area of lower concentration. (This is the same concept you saw in diffusion!)

**Purpose:**

In the following experiment you will observe a number of “cells”. They will be placed in different concentrations of solutions to see whether or not there is any movement of water (osmosis). You will predict (form a hypothesis) what will happen in each of the “cells”, take down data, and graph your results. You will then come to a conclusion and determine which way water moved in each situation.

**Procedure:**

# Day 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Take 5 dialysis bags (semi-permeable membrane) that have been soaking in water. Tie a piece of string at one end.
2. Filled each with the following, using a pipet:
   1. 20 mL of distilled water
   2. 20 mL of 0.2 M sucrose (table sugar)
   3. 20 mL of 0.4 M sucrose
   4. 20 mL of 0.6 M sucrose
   5. 20 mL of 0.8 M sucrose
3. Mass each of the bags after being filled and record in Table 1.
4. Fill 5 beakers (250 mL size) with 150 mL of distilled water. Label them with the letters a-e. to correspond to the bags listed above.
5. Place each of the bags in the correct 250 mL beakers.
6. Wait for 30 minutes, remove each bag, and gently dab the bag.
7. Mass each of the bags and record the data in Table 1.
8. Return the bags to the correct beakers. Leave for the next class, so that further data can be collected.
9. In the classes that follow, more data will be collected and recorded. The data will then be shared with all classes sharing the same room, so that it can later be graphed and analyzed.

# Day 2\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Record class data from other classes in Table 1 below.
2. Draw a graph of the data, placing time on the x-axis and mass on the y-axis.
3. You will need to use different colors of lines to record the data for each of the concentrations (for example: red: distilled water, blue for 0.2 M sucrose, green for 0.4 M sucrose, etc.)

## Data collection:

**Table 1:** **Change in mass of dialysis bags due to osmosis**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dialysis bag | Mass  (grams)  Beginning | Mass  (grams)  (mod 1-2) | Mass  (grams)  (mod 3-4) | Mass  (grams)  (mod 5-6) | Mass  (grams)  (mod 7-8) | Mass  (grams)  (mod 9-10) |
| Distilled water |  |  |  |  |  |  |
| 0.2 M sucrose |  |  |  |  |  |  |
| 0.4 M sucrose |  |  |  |  |  |  |
| 0.6 M sucrose |  |  |  |  |  |  |
| 0.8 M sucrose |  |  |  |  |  |  |

**Graph: Your teacher will supply the graph paper**

**Analysis:**

**What’s in the bag?**

## Table 1: Change in mass of dialysis bags due to osmosis

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dialysis bag | Mass  (grams)  Beginning | Mass  (grams)  (mod 1-2) | Mass  (grams)  (mod 3-4) | Mass  (grams)  (mod 5-6) | Mass  (grams)  (mod 7-8) | Mass  (grams)  (mod 9-10) |
| Distilled water |  |  |  |  |  |  |
| 0.2 M sucrose |  |  |  |  |  |  |
| 0.4 M sucrose |  |  |  |  |  |  |
| 0.6 M sucrose |  |  |  |  |  |  |
| 0.8 M sucrose |  |  |  |  |  |  |