*Passive Transport Lab and Analysis*

*Biology*

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 **Osmosis Lab**

**Procedure:**

DAY 1

1. Label your 4 cups A, B, C, & D and put a lab group member's initials on each of them.
2. Find the mass of each cup. Be sure and write these down!
3. Place one bear in each cup and find the re-mass each cup. You should measure them to the nearest 0.01 g. Record your data in the data table.
4. Cover the bears with 40-50ml of the correct solution. Do not mix up the graduated cylinders!
5. Put your LABELED (lab member's name) cups on the back table overnight.

DAY 2

1. Take cups to your station. Using a plastic spoon or forceps, gently put each bear onto a paper towel and gently blot off the excess water. Discard the solution in the sink and throw cup in trashcan. Using a weigh boat, find the mass of each bear and record it in the data table.
2. Determine the % change in mass of each bear by subtracting the ending mass from the beginning mass and divide by the beginning mass. Multiply x 100. If the mass decreased, then the % change should be negative. If it increased, it will be positive. Each lab group will put their data on the white board.
3. Determine which solution was: distilled water (0% NaCl); 10% NaCl; 20% NaCl; 30%NaCl
4. Make a bar graph showing the AVERAGE beginning and ending masses for the bears in each solution of EACH LAB GROUP. Use a pencil and a ruler. Label each axis, give appropriate units and title each graph.
5. Next, make a line graph of your group's data comparing concentration with percent change. The independent variable goes on the x-axis; dependent on y-axis. Make a line graph with a **best-fit line**.

**Data Table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Solution** | **Bear,** **Initial Mass** | **Bear,** **Final Mass** | **Percent Change***= (Final mass – Initial mass) / Initial Mass x 100* |
| **A** |  |  |  |
| **B** |  |  |  |
| **C** |  |  |  |
| **D** |  |  |  |

**Class Data – Average of each group’s Initial Mass & Final Mass**

|  |  |  |  |
| --- | --- | --- | --- |
| **Solution** **A** | **Solution** **B** | **Solution** **C** | **Solution** **D** |
| *Initial Mass:* | *:* |  |  |
| *Final Mass:* |  |  |  |

**Questions:**

1. What is the concentration of each solution?

Circle the correct answer:

|  |  |
| --- | --- |
| **Solution A** | **Water 10% 20% 30%** |
| **Solution B** | **Water 10% 20% 30%** |
| **Solution C** | **Water 10% 20% 30%** |
| **Solution D** | **Water 10% 20% 30%** |

2. Explain your reasoning using appropriate science terms/vocabulary in paragraph form.

**Bar Graph – Class Data. Compare each solution, A, B, C, D, with the class average for both initial mass and final mass. Scale appropriately and label each axis. Give a title. *Colored pencils recommended. If only using pencil, you must give a ‘key’.* *Use a ruler!***



 **A B C D**

 **A B C D**

**Line graph: (*Before scaling your graph, in PENCIL, think where ‘0’ should be*)**

**TITLE:**



 **Solution Concentration**

1. Look on your line graph. Find the point where your line crosses the 0 line. This is the point where the eggs do not lose or gain any mass. Follow down to the bottom axis to see the concentration of salt at this point. What is the concentration? What information does this tell you about this point?
2. Describe each solution as Hypo-, Hyper-, or Iso- tonic. Explain how you know.

|  |  |  |
| --- | --- | --- |
| **Solution** | **Hypo- Hyper- or Iso- Tonic?** | **Why?** |
| **A** |  |  |
| **B** |  |  |
| **C** |  |  |
| **D** |  |  |

1. Compared to water, the environment on the inside of the blood cell could best be described as:

a. hypertonic

b. hypotonic

c. isotonic

1. What would happen if you gave a patient an IV of pure water?

a. Their blood cells would shrink.

b. Their blood cells would burst.

c. The patient would slowly become rehydrated.

d. I would be promoted for my outstanding level of medical care.

1. I am doing an experiment on osmosis. I take some dialysis tubing (a semi-permeable membrane) and fill it with a 50% sugar solution. Sugar molecules are very big, and cannot pass through the membrane. If I want to make the cell gain weight, which beaker should I place it into?

a. beaker of 70% sugar solution

b. beaker of water

c. beaker of 90% sugar solution

d. beaker of any type of sugar solution

e. None of these conditions would cause the cell to gain weight

1. If someone sitting at the other end of a restaurant smokes a cigarette, you may still breathe in some of the smoke. The movement of smoke through the air of the restaurant is an example of what type of transport?

a. osmosis     b. diffusion     c. facilitated diffusion     d. active transport

1. If a cell’s cytoplasm contains 30% solute, which of the following best describes the rest of the cytoplasm?

a.70% solute b. 30% solute c. 70% water d. 30% water e. 30% solvent