**Diffusion and Osmosis Lab- procedure and requirements**

Part I: Cell Size and Shape

Background: Remember the structure and function of the cell membrane? One property of the cell membrane is flexibility. This is due to the fluid phospholipid bilayer. Cells can take on many different shapes and sizes. Think about the surface area to volume lab and the cell specialization lab. **What are some ways cells increase their surface area (membrane) so they can carry out the function of homeostasis more efficiently?**

Procedure:

1. You will create model cells out of the phenolphthalein agar. Your group may decide to test the idea of shape OR size with the ‘cells’.
2. Make your plan and cut, punch, sculpt, etc. your model cells out of the pink agar. Make at least two ‘cells’.
3. Place them in the plastic petri dish base, lid or both with 0.1 M HCl (or white vinegar). Make sure you wear goggles and gloves if you are pouring the acid and when you are handling the agar.
4. Write a hypothesis of what you think will happen. Create a data table to record your observations and measurements.
5. Clean up. Pour HCl into disposal container on the front table. Deposit all used and unused agar into the disposal container. Rinse all hardware and return them to the counter by the sink in the prep. room.

*Lab Report:*

1. *Describe the reaction between phenolphthalein and acids or bases.*
2. *Draw or describe your ‘cells’ size and shape.*
3. *Data table with measurements and/or observations.*
4. *Summary of results.*

Part II: Solutions in Disguise

Design an experiment to identify the concentrations of the mystery sucrose solutions and use the solutions to determine the water potential of the plant tissues. (You might want to review the information on water potential.)

Materials: potatoes, beakers, thermometers, knives, cork borers, balances, rulers, petri dishes, graduated cylinders, other materials by request

Procedure:

1. Design an experiment to gather data that will help us put the mystery sugar concentrations in order.
2. Write out your experiment. Include materials, independent and dependent variables, constants and controls. Have Mrs. Hawley approve your design.
3. Make a hypothesis about what you will see in the different solution tests. If the solution you test has a high concentration what will happen to the sample in your experiment? If the solution you test has a low concentration what would you expect to see happen to the sample in the experiment?
4. Set-up your lab on the side counters near your table.
5. Create a table to record results.
6. Once you have recorded your data, put the solutions in order from least to most concentrated. See Mrs. Hawley to check your results.

*Lab Report:*

1. *State the purpose of the lab.*
2. *Procedure for set-up and execution of your group’s lab.*
3. *Data*
4. *Summary-explain what happened in your data and record your group’s suggested order of the solutions from least to most concentrated. Was your group’s estimate correct? What were some sources of error in your group’s experiment?*
5. *Calculate the water potential for each solution. Do these go in order and match your solutions.*
6. *Additional Questions*
   1. *Which solution had a water potential equal to that of the plant cells? How do you know?*
   2. *How would your results be if the potato were placed in a dry area for several days before your experiment?*
   3. *Could this experiment have been conducted with animal cells? Why or why not?*
   4. *Could this experiment have been conducted with fungal cells? Why or why not?*