2: Determine the internal concentration water in potato cells

Time: 1.5 h

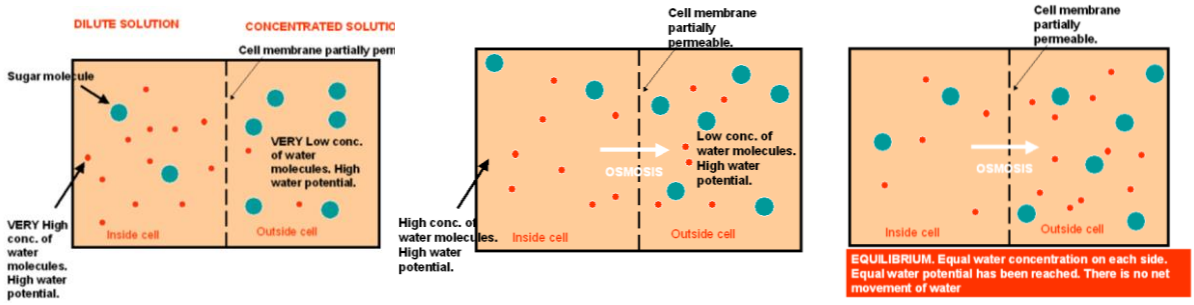
Evaluated criteria: Analysis, Evaluation and Communication (see rubrics before writing)

Objective:

- To find the internal concentration of a water in a potato cell.
- To learn how to process data and write a conclusion and evaluation.

Background information:

Osmosis is the movement of water from a solution with high solute concentration to a low solute concentration.



- A solution that has the same water concentration as a cell is called **ISOSMOTIC**, there will be no net movement of water molecules.
- A solution with a lower water concentration is called **HYPEROSMOTIC**, there will be net movement of water out of the cell.
- A solution with a higher water concentration is called **HYPOSMOTIC**, there will be a net movement of water into the cell.

<u>Materials</u>

1 M sucrose solution	100 mL volumetric flask	Metric ruler
Potato	25, 50 and 100 mL measuring cylinder	Electronic scale
Knife	5 beakers	Distilled water
Potato chopper	Dropper	Tissue paper

Method

Working in groups of three prepare 100mL sucrose solutions of the following concentrations:

1. Each person prepares three different solutions, but one by one:
   Person 1→0.0 M, 0.1 M, 0.2 M
   Person 2→0.3 M, 0.4 M, 0.5 M
   Person 3→0.6 M, 0.7 M, 0.8 M
2. In order to make the solutions you will dilute a 1 M sucrose solution (already prepared) using distilled water.
3. Pour 100mL of your solution into each of the 5 beakers.
4. Take a potato slice with a thickness of 1 cm, and cut it with the potato chopper until you have 25 pieces with a similar mass and surface area.
5. Dry off the pieces and measure their mass in groups of 5 pieces of potato using a scale. Write down their initial mass and separate them clearly on your table.
6. Place the the five groups of 5 pieces of potato in the five beakers with the sucrose solution you have prepared and leave it for 30 minutes.
7. Remove, dry and weigh again. Write down their final mass.
8. Repeat this with the other 2 concentrations. (check the time, maybe you should get some more beakers and do two at a time!)
9. Share your data with the rest of your classmates.
10. Record the initial and final mass for each sucrose solution in a table and calculate the average of the five trials you did.
11. Calculate the mass percent variation over the average of each sucrose solution.

Mass percent variation= (final mass – initial mass / final mass) x 100

Data process:
Present the raw data and the processed data in a table.
Draw a graph with the uncertainties, units, SD and lines of best fit.

Conclusion and evaluation:
Use your data process to conclude and explain which concentration the unknown solutions had. Evaluate the method and analise the strengths and weaknesses of the experiment. Propose some improvements based on those weaknesses.

DUE DATE 06/12/15 (send by email)