**IA: Osmosis in Potatoes – Analysis and Evaluation**

When a plant cell is bathed in a solution of the same concentration as its cytoplasm, its mass and volume remain the same, because water enters and exits at the same rate (isotonic). When samples of tissues are immersed in solutions of different concentrations, the cells will gain water (and mass) in solutions of lower solute concentration than that of the tissue, and lose water (and mass) in solutions of higher solute concentration than the tissue.

**Research Question:** How does changing the solute (salt) concentration affect osmosis in potato pieces, measured by a change in mass (g)?

**Hypothesis:**

**Materials:**

* 1 or 2 Potatoes
* 10 ml of each sucrose solutions 0.2 mol L-1, 0.4 mol L-1, 0.6 mol L-1, 0.8 mol L-1
* Paper towel
* 15 Coloured pins
* Electronic balance
* 5 Boiling Tubes and rubber bungs
* Knife/potato borer
* Tweezers
* Ruler
* Stopwatch
* Cutting board

**Basic Method:**

1. Collect distilled water and sugar solutions; 0.2 mol L-1, 0.4 mol L-1, 0.6 mol L-1, 0.8 mol L-1.
2. Fill a boiling tube with 10 mL 0.2 mol L-1 solution. Clearly label the boiling tube.
3. Repeat with each of the other solutions including the distilled water
4. Cut 15 chips from the same potato to the same size and shape using a cork borer.
5. Blot each chip with a paper towel.
6. Weigh each chip and identify it using a coloured pin.
7. Place 3 chips each of the boiling tubes making sure that the weight and pin coloured are carefully recorded
8. Cover each boiling tube with a rubber bung.
9. Place all the boiling tubes in the same place in the fridge so that the temperature remains the same.
10. Leave all chips in the solution for at least 12 hours.
11. Remove a chip, blot it dry with a paper towel, when reweigh it. Record the final weight making sure to use the same electronic scales to ensure consistency.

A **method** includes:

* **valid** range IV - five conc including distilled water (step 1);
* DV – mass of chips before (step 6) & after (step 11);
* Repeats (step 3 & 7)
* CV - volume of solution (step 2), same potato (step 4), same shape/size chips (step 4), blotting dry before weighing (steps 5 & 11), cover to stop evaporation (step 8), stated time (step 10), same temperature (step 9), same scales (step 11).