

Experiment on osmosis assignment



**ASSIGN
BUSTER**

GCSE – Human Physiology and Health An experiment to investigate what affect sucrose solution has on potato tissue. Background Osmosis is the movement of water molecules, across a partially permeable membrane from a region of high concentration of water to a low concentration of water molecules. A partially permeable membrane is a membrane with holes in it small enough for only water to go through it. Big molecules like glucose cannot fit through it. Osmosis allows plants to take in water through their roots, and is also used in kidney dialysis machines to filter the blood.

Aim The aim of this experiment is to investigate how potato tissue changes when placed in sucrose solution of different concentrations. I want to find out if and how osmosis differs, when the concentration is changed. The Fixed

Variables There are several fixed variables I can control in order to get a different outcome to my experiment: 1)Temperature of the atmosphere in which the investigation takes place 2)Surface on which the investigation takes place 3)Length of time in which the chip is submerged in the solution 4)Position of potato chip 5)Size of potato chip 6)Amount of solution

7)Concentration of solution. Diagram Method 1, 2, 3&4) gather all the equipment needed, as per the list below. A range of sucrose solutions will then be prepared with concentrations of 0.00 molar, 0.25 molar, 0.50 molar, 0.75 molar and 1.00 molar. You will need to measure 15ml of each of the solutions in a measuring cylinder. You can check that the volume is at the correct measurement, by bending down to eye level. This will give you an accurate reading. You can also alter the concentration by using a pipette.

You will then place each 15ml of solution into the correct specimen tubes.

You then need to add a label to each specimen tube to advise what sucrose

solution is in what. For organisation's sake, we set up all of the specimen tubes at once, and labelled them individually to avoid confusion later on. You should end up with 3 test tubes of each solution (15 test tubes in all). (5&6) A large potato will be selected and using a number 4 cork borer, push out 15 pieces. A poker will be used to separate each piece of potato from the borer. 7) You should then cut, with a scalpel, the skin from the ends of the potato. The skin is waterproof therefore if you were to leave the skin on, it will not allow the water to enter the potato evenly. (8) You will then measure, with a ruler, each potato, at 20mm. You will need to measure each potato in mms because it will give a more accurate measurement. Cut with a scalpel and repeat this 15 times. This part of the preparation must be done very accurately as a change in the surface area may allow more or less osmosis to occur. 9) The mass of each potato will be measured, on a 2 decimal place weighing scale. (10) Record each potato mass in a table. (11) The potato tubes will then be placed into the test tubes, taking care to place each potato in each specimen tube according to your table. It is important to keep a record, to control which potato has gone into which sucrose solution, for the results to create an accurate conclusion. (12) Start the stopwatch and leave the potatoes to soak in the sucrose solution for 30mins. (13) After 30 minutes, empty each specimen tube, leaving only the potato inside. 14) Before you weigh each potato again, you need to dab them with a paper towel. If excess water were left on the potato, the weights would not be accurate. (15) Repeat this with the 14 potato tubes left. Once all the potatoes are out of the solution, the potato tubes need to be measured on the same weighing scales used before (2 decimal places). (16) Record the results. By doing the experiment 15 times at once, this will save time, but

will also, hopefully produce more accurate results from which I will be able to draw a more accurate conclusion. Table Of Results

Concentration Length (mm) Weight (mm) Before After 15ml of 0.00 mol dm⁻³ 20mm 15ml of 0.00 mol dm⁻³ 20mm 15ml of 0.00 mol dm⁻³ 20mm 15ml of 0.25 mol dm⁻³ 20mm 15ml of 0.25 mol dm⁻³ 20mm 15ml of 0.25 mol dm⁻³ 20mm 15ml of 0.50 mol dm⁻³ 20mm 15ml of 0.50 mol dm⁻³ 20mm 15ml of 0.50 mol dm⁻³ 20mm 15ml of 0.75 mol dm⁻³ 20mm 15ml of 0.75 mol dm⁻³ 20mm 15ml of 0.75 mol dm⁻³ 20mm 15ml of 1.00 mol dm⁻³ 20mm 15ml of 1.00 mol dm⁻³ 20mm Graph See graph paper added Safety Issue Risk Management Glass tile If it breaks you could cut yourself.

Take care when handling. Keep the tile in the middle of the bench to ensure you don't knock it off. Scalpel Could cut your fingers if not handled correctly Make sure your fingers are out of the way when cutting the skin off the end of the potato. Cork Borer Could go through your hand if holding the potato Make sure the potato is placed on the white tile. Equipment
 1) Weighing scales at 2 decimal places. 2) White Tile. 3) Pipette. 4) Scalpel.
 5) Measuring cylinder. 6) Potato. 7) Paper towels. 8) Number 4-cork borer.
 9) Poker. 10) Ruler. 11) 15 specimen tubes. 12) 15 labels for sucrose solution.