Osmosis Investigation Practical Guide

Aim: Investigate the effect of varying concentrations of salt solution on the mass of plant tissue.

Equipment Per Group	Method	Notes and guidance
• Potato • Cork borer • Ruler • 10ml measuring cylinder • Labels • 5x boiling tubes • Boiling tube rack • Paper towels • Plastic knife • White tile • 1M Salt solution • Distilled water • Balance (2d.p.) • Forceps	1. Cut five cylinders from a potato using the cork borer. 2. Use the knife to cut off the skin and to trim each cylinder to the same length. 3. Measure the mass and length of each potato cylinder and record these measurements on your table. 4. Fill four boiling tubes with 10ml of salt solution at concentrations of 1M, 0.75M, 0.5M, 0.25M. Add 10ml of water to the fifth. 5. Put one potato cylinder into each boiling tube. 6. Leave the potato cylinders in the solutions as osmosis occurs. This could be overnight or until the end of the lesson. 7. Carefully remove the potato cylinders from the boiling tubes using forceps if necessary. Blot them dry with paper towel. 8. Measure the new mass and length of each potato cylinder and record these measurements on your table. Calculate the change in mass and then percentage change in mass.	Leave the potato cylinders in the boiling tubes overnight for the best results. If this is not possible, use as much time as possible in a lesson and that should be sufficient to demonstrate the effect. Students should be able to make their own dilutions of salt solution. This is invaluable practice for future experiments. You may wish to spend some time explaining this part of the method if they might find it difficult. Scalpels are often advised for more precise trimming, but they are much more hazardous. Plastic knives should be sufficient.

Salt Solution ->	1M	0.75M	0.5M	0.25M	Water
Initial mass (g)					
Final mass (g)					
Change in mass (g)					
Percentage change in mass (%)					
Initial length (cm)					
Final length (cm)					
Change in length (cm)					
Percentage change in length (%)					

General Teacher Notes

A risk assessment must to be completed for this practical. The risk assessment should be specific to the class involved and written only by the teaching member of staff. If you wish to leave the potato cylinders overnight, make sure you let the technician know in advance so they can store them and provide balances and rulers for the next lesson. Ensure any sharps are thoroughly cleaned before use. If injury occurs, immediately wash the affected area and seek first aid attention. Record and monitor the injury.
Clearing up
Rinse all used equipment and place it in a tray for washing up. Return clean equipment and chemical bottles to the tray the equipment was delivered in. Report any breakages or spills to the technician immediately. If you are leaving the potato cylinders overnight, alert the technician so they are not thrown away.

Technician Notes	Hazcards	Clearing away
Here are the ratios for diluting the salt solution: 10ml salt solution = 1M 7.5ml salt solution plus 2.5ml water = 0.75M 5ml salt solution plus 5ml water = 0.5M 2.5ml salt solution plus 7.5ml water = 0.25M See CLEAPSS Recipe Cards to make up a 1M salt solution. Large baking potatoes work best for this practical.	n/a	Ask the teacher whether the potatoes will be left overnight so that they are not cleared away in this case.