GCSE Biology required practical activity 3: Osmosis

Student sheet

Required practical activity	Apparatus and techniques
Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue.	AT 1, AT 3, AT 5

Investigating osmosis in potato tissue

Osmosis is the movement of water through a selectively permeable membrane from an area of high concentration of water to an area of lower concentration of water.

Plant tissues, such as potato, can be used to investigate osmosis.

In this experiment potatoes are cut into equal sized cylinders. The changes in length and mass after leaving them overnight in sugar solution and distilled water can then be accurately compared.

Learning outcomes
1 **2** **Teachers to add these with particular reference to working scientifically**

Method

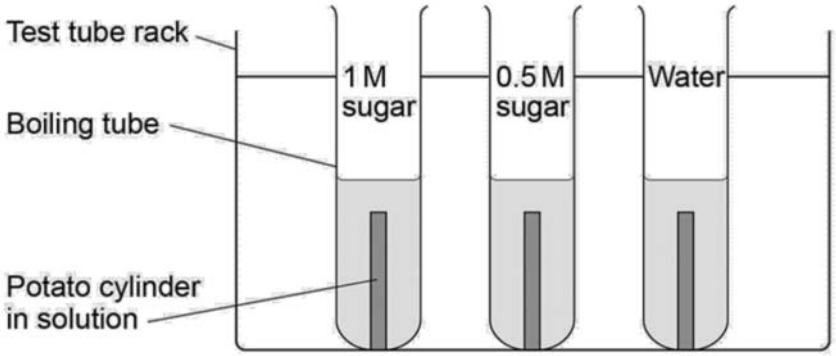
You are provided with the following:

- a potato
- a cork borer
- a ruler
- a 10 cm^3 measuring cylinder
- labels
- three boiling tubes
- a test tube rack
- paper towels
- a scalpel
- a white tile

- 1 M sugar solution
- 0.5 M sugar solution
- distilled water
- a top-pan balance.

You should read these instructions carefully before you start work.

1. Using a cork borer, cut three potato cylinders of the same diameter.
2. Trim the cylinders so that they are all the same length (about 3 cm).
3. Accurately measure and record the length and mass of each potato cylinder.
4. Measure out 10 cm^3 of the 1 M sugar solution and place into the first boiling tube (labelled 1 M sugar).
5. Measure out 10 cm^3 of 0.5 M sugar solution and place into the second boiling tube (labelled 0.5 M sugar).
6. Measure out 10 cm^3 of the distilled water into the third boiling tube (labelled water).
7. Add one potato cylinder to each tube (make sure you know which one is which in terms of the length and mass).



8. Record your lengths and masses in a table such as the one below.
9. Leave the potato cylinders in the boiling tubes overnight in the test tube rack.
10. Remove the cylinders from the boiling tubes and carefully blot them dry with the paper towels.
11. Re-measure the length and mass of each cylinder (make sure you know which is which).

	1 M sugar solution	0.5 M sugar solution	Distilled water
Initial length (mm)			
Final length (mm)			
Change in length (mm)			
Initial mass (g)			
Final mass in (g)			
Change in mass in (g)			

12. Draw a graph with 'Change in mass in g' on the y-axis against 'Concentration of sugar solution' on the x-axis.