GCSE Biology required practical activity: Osmosis

Investigating osmosis in potato tissue

Risk assessment

Care should be taken:

- cutting potato cylinders
- with the use of an electrical balance in the presence of water.

Method

You are provided with the following:

- a potato
- a cork borer or potato chipper/ vegetable stick cutter
- a ruler
- a 10 cm^3 measuring cylinder
- labels
- three boiling tubes
- a test tube rack
- paper towels
- a sharp knife
- a white tile
- a range of sugar solutions
- distilled water
- a top-pan balance.

Read these instructions carefully before you start work.

1. Use a cork borer to cut three potato cylinders of the same diameter.

2. Trim the cylinders so that they are all the same length (about 3 cm).

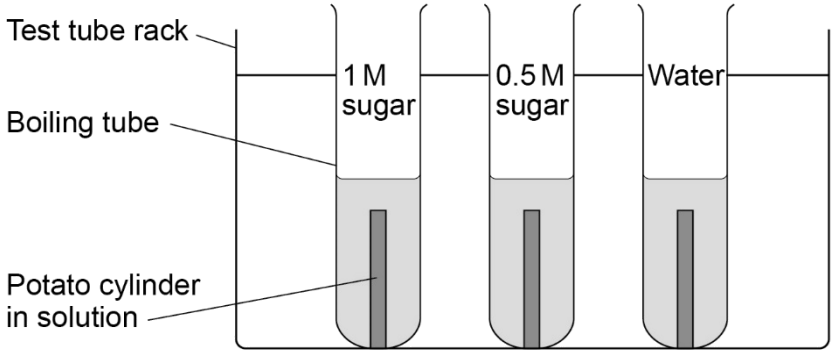
3. Accurately measure and record the length and mass of each potato cylinder.

4. Measure 10 cm^3 of the 0.5 M sugar solution and put into the first boiling tube. Label boiling tube as: 0.5 M sugar.

5. Measure 10 cm^3 of 0.25 M sugar solution and put into the second boiling tube. Label boiling tube as: 0.25 M sugar.

6. Measure 10 cm^3 of the distilled water and put into the third boiling tube. Label boiling tube as water.

7. Add one potato cylinder to each boiling tube. Make sure you know the length and mass of each potato cylinder in each boiling tube.



8. Record the lengths and masses of each potato cylinder in a table such as the one below.

	0.5 M sugar solution	**0.25 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)			

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).

    Record your measurements in the table. Then calculate the changes in length and mass of each potato cylinder.

12. Plot a graph with:

    - 'Change in mass in g' on the y-axis
    - 'Concentration of sugar solution' on the x-axis

13. Plot another graph with:

    - 'Change in length in mm' on the y-axis

- ‘Concentration of sugar solution’ on the x-axis.

Compare the two graphs that you have drawn.