D2.3 Water potential: data-based questions

What the Cell · DP Biology · data-based questions

Name _____ **Date** _____ **Total** _____ / 9

Read the data carefully before you answer. The number of marks shows how many separate points to make. Show your working in calculations.

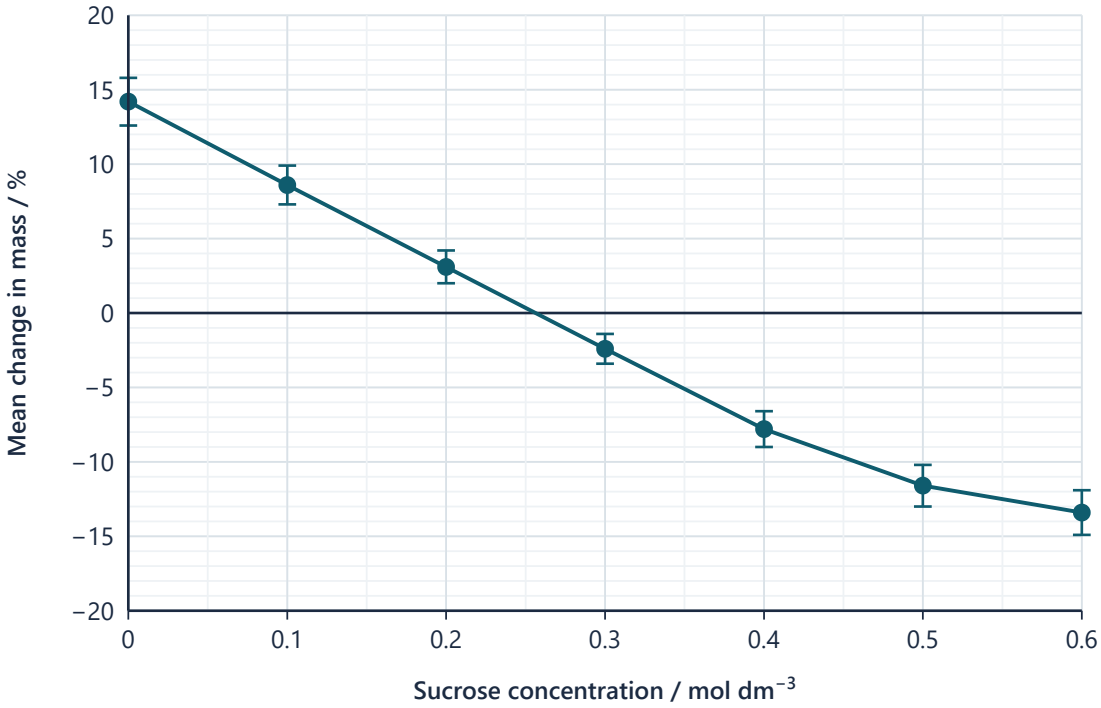
1 Osmosis in potato tissue

9 marks



Photo: ZooFari, Public domain, Wikimedia Commons.

Cylinders of potato tuber (*Solanum tuberosum*), each about 2.5 g, were blotted, weighed and placed in sucrose solutions at 20 °C. After 24 hours they were blotted and weighed again. Three cylinders were used for each concentration. The graph shows the mean percentage change in mass. Error bars show ± 1 standard deviation.



a **Estimate** the sucrose concentration that has the same water potential as the potato cells. **[1]**

b One cylinder in 0.4 mol dm^{-3} sucrose had a mass of 2.48 g at the start and 2.29 g at the end. **Calculate** its percentage change in mass. **[1]**

c **Explain** why the results are given as percentage change in mass, not change in mass. **[2]**

d **Explain** the change in mass of the cylinders in 0.0 mol dm^{-3} sucrose. **[2]**

e **Suggest** why the mass changes less between 0.5 and 0.6 mol dm^{-3} than between 0.0 and 0.1 mol dm^{-3}. **[1]**

f Red blood cells are placed in distilled water. **Predict** what happens to them, and **explain** how this differs from the potato cells. **[2]**