D2.3 Water potential

What the Cell · DP Biology · worksheet · SL statements D2.3.1–7

Name _____ **Date** _____ **Total** _____ / 36

About 35 minutes, or one section at a time. You will need a calculator. The number of marks shows how many separate points to make.

Section A: Recall

6 marks

1 **Define** solvation. D2.3.1 **[1]**

2 **Define** hypertonic. D2.3.2 **[1]**

3 **State** what happens to an animal cell in a hypertonic solution. D2.3.5 **[1]**

4 **State** the name of the process in which a plant cell membrane pulls away from its wall. D2.3.6 **[1]**

5 **State** two medical uses of isotonic solutions. D2.3.7 **[2]**

Section B: Understanding

14 marks

6 **Explain** why sodium chloride dissolves in water. D2.3.1 **[3]**

7 **Explain** what is happening to water molecules when a cell is in an isotonic solution. D2.3.3 **[2]**

8 **Compare and contrast** the effects of a hypotonic solution on animal cells and plant cells. D2.3.5, D2.3.6 **[3]**

Animal cell	Plant cell

9 **Explain** why a freshwater unicellular organism needs a contractile vacuole. D2.3.5 **[3]**

10 **Explain** why an organ for transplant is bathed in an isotonic solution. D2.3.7 **[3]**

Section C: Working with data

11 marks

All data in this section are invented for practice. The patterns are realistic.

11 D2.3.4

Potato cylinders were placed in sucrose solutions for one hour. Three repeats were carried out.

Sucrose / mol dm^{-3}	Starting mass / g	Final mass / g
0.0	4.00	4.60
0.2	3.80	4.10
0.4	4.20	4.11
0.6	4.00	3.68

a **Calculate** the percentage change in mass at 0.0 and at 0.6 mol dm^{-3}. **[2]**

b **Explain** why percentage change is used. **[1]**

c **Estimate** the isotonic concentration, giving a reason. **[2]**

d **Explain** the change in mass at 0.6 mol dm^{-3}. **[2]**

e **Suggest** two ways to make the results more reliable. **[2]**

f State what standard deviation would show about the repeats. **[2]**

Section D: Longer answer

5 marks

12 **Explain** how the movement of water by osmosis affects plant cells, and how this helps to support a plant. D2.3.3, D2.3.6 **[5]**

What the Cell. Original questions written for this course.