A1.1 Water

What the Cell · DP Biology · worksheet · SL statements A1.1.1–6

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

About 35 minutes, or one section at a time. A calculator is allowed. The number of marks shows how many separate points to make.

Section A: Recall

7 marks

1 **State** the type of bond between atoms within a water molecule. A1.1.2 **[1]**

2 **State** the type of attraction between adjacent water molecules. A1.1.2 **[1]**

3 **Define** adhesion. A1.1.4 **[1]**

4 **Define** hydrophilic. A1.1.5 **[1]**

5 **List** three physical properties of water that affect animals living in water. A1.1.6 **[3]**

Section B: Understanding

13 marks

6 **Draw** two water molecules, with a hydrogen bond between them, showing polarity. A1.1.2 **[3]**

7 **Explain** how cohesion helps water move up a tall tree. A1.1.3 **[3]**

8 **Explain** why glucose is transported dissolved in blood plasma, but cholesterol is not. A1.1.5 **[4]**

9 **Outline** why the hydrophobic nature of some molecules is useful to cells. A1.1.5 **[3]**

Section C: Working with data

10 marks

Values in question 10 are approximate. Results in question 11 are invented for practice.

10 A1.1.6

Property, at 20°C	Water	Air
Density / kg m^{-3}	998	1.2
Viscosity / mPa s	1.0	0.018
Thermal conductivity / W m^{-1} K^{-1}	0.60	0.026

a **Calculate** how many times greater the thermal conductivity of water is than that of air. **[1]**

b **Explain** how this difference affects a seal that moves between water and air. **[2]**

c **Explain** how the difference in density affects a bird that both flies and dives. **[2]**

11 A1.1.3, A1.1.4

Students counted how many drops of liquid fit on a coin before spilling.

Liquid	Trial 1	Trial 2	Trial 3
Water	34	38	36
Cooking oil	14	12	13

a **Calculate** the mean number of drops for each liquid. **[2]**

b **Explain** the difference in terms of molecular attraction. **[3]**

Section D: Longer answer

6 marks

12 **Explain** how hydrogen bonds give water properties that are useful to living organisms. A1.1.2–6 **[6]**