B2.1 Membranes and membrane transport

What the Cell · DP Biology · worksheet · SL statements B2.1.1–10

Name _____ **Date** _____ **Total** _____ / 40

About 40 minutes, or one section at a time. The number of marks shows how many separate points to make.

Section A: Recall

7 marks

1 **Define** amphipathic. B2.1.1 **[1]**

2 **State** two gases that cross membranes by simple diffusion. B2.1.3 **[1]**

3 **Distinguish** between integral and peripheral proteins. B2.1.4 **[2]**

4 **Outline** the role of aquaporins. B2.1.5 **[1]**

5 **State** two roles of glycoproteins and glycolipids. B2.1.9 **[2]**

Section B: Understanding

15 marks

6 **Explain** why phospholipids form bilayers in water. B2.1.1 **[3]**

7 **Explain** why a phospholipid bilayer is a barrier to ions. B2.1.2 **[2]**

8 **Explain** osmosis, using the terms membrane and solute. B2.1.5 **[3]**

9 **Compare and contrast** facilitated diffusion and active transport. B2.1.6, B2.1.7 **[4]**

Facilitated diffusion	Active transport

10 **Explain** how a membrane can be selectively permeable. B2.1.8 **[3]**

Section C: Working with data

12 marks

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

11 B2.1.3, B2.1.6

The rate at which two substances entered cells was measured at a range of outside concentrations.

Outside concentration / mmol dm^{-3}	1	2	4	8	16
Substance X: rate / arbitrary units	2	4	8	16	32
Substance Y: rate / arbitrary units	5	9	14	16	16

a **Describe** the trend for each substance. **[2]**

b **Deduce**, with a reason, which substance crosses by simple diffusion. **[2]**

c **Explain** why the rate for the other substance stops rising. **[2]**

12 B2.1.7, B2.1.8

Slices of carrot were kept in a solution of potassium ions. The uptake of potassium was measured with and without a substance that stops cell respiration.

Condition	Potassium ion uptake / μmol g^{-1} h^{-1}
No inhibitor	12.0
With inhibitor	1.5

a **Calculate** the percentage decrease in uptake. **[1]**

b **Explain** what these results suggest about how potassium ions enter the cells. **[3]**

c **Suggest** why some uptake continued with the inhibitor. **[2]**

Section D: Longer answer

6 marks

13 **Draw** a labelled diagram of the fluid mosaic model of a membrane. B2.1.10 **[6]**