Year 12 Science: Cells, organelles and membrane transport

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. A cube-shaped cell has sides of 3 µm. What is its SA:V?

2. A potato cylinder goes from 4.00 g to 3.70 g in a salt solution. What is its percentage change in mass?

3. Glucose enters a cell down its concentration gradient through a carrier protein, without ATP. Which transport method is this?

4. A red blood cell is put into pure water. What happens to it, and why?

5. Sperm cells swim using a tail that needs a lot of ATP. Which organelle would you expect to find in large numbers near the tail?

Exam-style question: seawater on a paddock

A storm surge floods a coastal paddock with seawater. A day later the ryegrass is wilting, even though the soil is soaking wet. Seawater is a much more concentrated salt solution than the sap inside the grass's root hair cells.

6. Describe osmosis.

7. Explain why the grass wilts after the seawater flood.

8. Before the flood, the root hair cells took in nitrate ions by active transport. Explain why this process needs mitochondria.

9. Discuss how the structure of a root hair cell suits it to taking in both water and mineral ions, and compare how the two cross the membrane.

Fix the mistake

10. Correct this statement: "In osmosis, the salt moves out of the cell into the water."

11. Correct this statement: "Water moves from a high concentration of solute to a low concentration of solute."

12. Correct this statement: "Facilitated diffusion uses energy because it uses a protein."

13. Correct this statement: "A bigger cell has a bigger SA:V because it has more surface area."