

Transport in cells: practice questions

5 questions · 16 marks · mark scheme at the back

For Edexcel GCSE Biology 1BI0 and Combined Science 1SC0. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 16

1 Which process needs energy from respiration? [1 mark]

- A. ☐ Diffusion of oxygen into a cell
- B. ☐ Osmosis of water into a root hair cell
- C. ☐ Active transport of mineral ions into a root hair cell
- D. ☐ Diffusion of carbon dioxide out of a cell

2 Compare diffusion and osmosis. [3 marks]

3 The concentration of mineral ions is higher in a root hair cell than in the soil water. Explain how the cell takes in mineral ions. [3 marks]

4 A potato cylinder had a mass of 2.50 g. After 30 minutes in a dilute sugar solution its mass was 2.80 g. Calculate the percentage change in mass. [3 marks]

Answer =

5 A student investigates osmosis using potato cylinders and sugar solutions of different concentrations. Describe how the investigation should be carried out, and explain how the results can be used to find the concentration of the solution inside the potato cells. **[6 marks]**

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Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

C C (1)

2. [3]

- both involve net movement down a concentration gradient / from high to low concentration (1) allow for osmosis, water moves from dilute to concentrated solution
- neither needs energy from respiration / both are passive (1)
- osmosis is the movement of water only, through a partially permeable membrane, whereas diffusion can involve any particles (1)

3. [3]

- by active transport (1)
- against the concentration gradient / from a low concentration to a high concentration (1)
- using energy from respiration (1)

4. [3]

- change in mass = $2.80 - 2.50 = 0.30$ g (1)
- $0.30 \div 2.50 \times 100$ (1)
- +12% / a 12% gain (1) correct answer with no working gains full marks

5. [6]

Level 3 5-6	A detailed and logical description of the method, with correct control variables, and a clear explanation of how the results are processed and used. Correct scientific terms are used throughout.
Level 2 3-4	A description of the method with some control variables, and some explanation of how the results are used, but with gaps.
Level 1 1-2	A few isolated points about the method or results, with little detail.

Indicative content

- cut cylinders of the same size from one potato using a cork borer
- measure the starting mass of each cylinder
- place each in a different concentration of sugar solution, including pure water, using the same volume
- leave for the same time at the same temperature
- blot dry and measure the final mass
- calculate the percentage change in mass for each solution
- plot percentage change in mass against concentration
- the point where the line crosses the x-axis (0% change) is where the solution has the same concentration as the potato cells, so there is no net movement of water
- repeat and calculate a mean