

Active transport: practice questions

5 questions • 13 marks • mark scheme at the back

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 13

1 Which statement describes active transport? [1 mark]

- A. ☐ Direction: down a concentration gradient; energy from respiration: needed
- B. ☐ Direction: against a concentration gradient; energy from respiration: needed
- C. ☐ Direction: against a concentration gradient; energy from respiration: not needed
- D. ☐ Direction: down a concentration gradient; energy from respiration: not needed

2 Describe two differences between diffusion and active transport. [2 marks]

3 **Supplement** [3 marks]

The concentration of nitrate ions is lower in the soil than inside a root hair cell. Explain how the root hair cell takes in nitrate ions and why it has many mitochondria.

4 **Supplement** [3 marks]

- (a) State what moves molecules or ions across a cell membrane during active transport. [1] (b) Explain why active transport stops in a cell that cannot respire. [2]

5

Supplement

[4 marks]

Barley roots were placed in solutions with and without oxygen. The uptake of nitrate ions was measured. (a) Describe the effect of removing oxygen on nitrate uptake. [1] (b) Explain this effect. [3]

Nitrate uptake by roots	
Condition	Nitrate uptake / arbitrary units
Oxygen present	45
Oxygen absent	6

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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]

B B (1)

2. [2]

- diffusion is down a concentration gradient but active transport is against a concentration gradient (1)
- active transport needs energy from respiration but diffusion does not (1)

3. [3] **Supplement**

- by active transport (1)
- movement is against the concentration gradient (1)
- mitochondria release energy (from respiration) needed for active transport (1)

4. [3] **Supplement**

- protein carriers (1) allow carrier proteins; ignore 'proteins' alone
- respiration releases the energy needed for active transport (1) reject 'respiration makes / produces energy'
- without this energy, particles cannot be moved against their concentration gradient (1)

5. [4] **Supplement**

- uptake is much lower / falls from 45 to 6 without oxygen (1)
- no oxygen so less aerobic respiration (1)
- less energy released (1)
- less active transport of nitrate ions (against the concentration gradient) (1)