

Active transport: practice questions

4 questions • 10 marks • mark scheme at the back

For Cambridge IGCSE Combined Science 0653. **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 10

1 **Supplement** [1 mark]

Which statement describes active transport?

- 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 **Supplement** [2 marks]

Describe two differences between diffusion and active transport.

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

[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] Supplement

B B (1)

2. [2] Supplement

- 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. [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)