Higher Tier — Separate Science

Full Higher Separate content. ★ = Higher Tier. ◆ = Separate Science only.

Q1. State ONE way that active transport differs from diffusion.

[1 mark]

Q2. Explain why root hair cells use active transport to absorb mineral ions from soil water, rather than diffusion.

[3 marks]

Q3. Glucose is absorbed from the gut into the bloodstream by active transport. Explain why this is necessary after blood glucose has already become high.

[3 marks]

Total: 7 marks

Active Transport

Q1 (1 mark)

State ONE way that active transport differs from diffusion.

• Active transport moves substances against the concentration gradient and requires energy (ATP) [1] — accept either difference

Q2 (3 marks)

Explain why root hair cells use active transport to absorb mineral ions from soil water, r…

• The concentration of mineral ions in the soil water is often lower than inside root cells [1]

• Diffusion would move minerals OUT of the cell — down the concentration gradient [1]

• Active transport uses ATP (from respiration) and carrier proteins to move ions from low to high concentration [1]

Q3 (3 marks)

Glucose is absorbed from the gut into the bloodstream by active transport. Explain why thi…

• After a meal, blood glucose concentration rises — it may now be higher than in the gut [1]

• Diffusion would move glucose back out of blood into gut [1]

• Active transport absorbs glucose from gut into blood even against the gradient — ensuring maximum absorption [1]