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Some scientists investigated the rates of absorption of different sugars by the small intestine.

In one experiment they used a piece of small intestine

In a second experiment they used a piece of small intestine that was poisoned by a chemical that prevents respiration

The results are shown in the table

Sugar	Absorption rate (arbitrary units)	
	Healthy intestine	Poisoned intestine (respiration stopped)
A	98	32
B	105	50
C	31	31
D	28	29

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Give two sugars from the table which can be absorbed by active transport

1 Sugar A [1]

2 Sugar B [1]

[2 marks]

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Use evidence from the table to explain why you chose these sugars

[3 marks]

Absorption reduced by poison [1]

Active transport needs energy [1]

less or no energy available with poison present or no respiration means no energy [1]

TOP TIP : Remember the key difference between active transport and diffusion is the energy needed and the fact that active transport goes against the concentration gradient

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3

All of the sugars in the table can be absorbed by diffusion.

Explain how information from the table provides evidence for this

[2 marks]

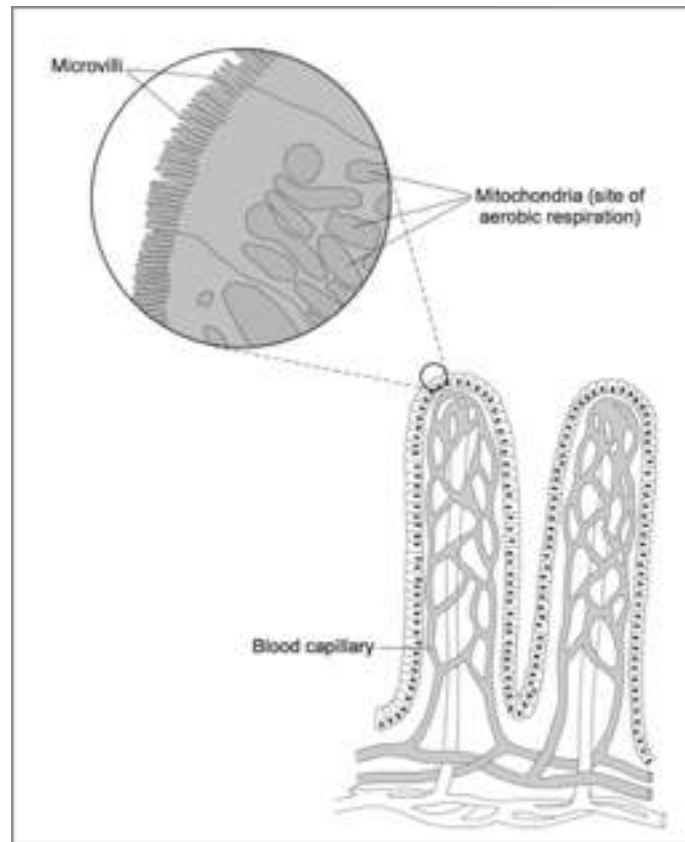
all/the sugars/they can be absorbed when the gut is poisoned/with poison/with no respiration [1]

diffusion does not need an energy supply [1]

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The small intestine is lined with millions of villi. The diagram shows the structure of a villus.



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In the small intestine, some of the products of digestion are absorbed into the blood by active transport.

Explain the meaning of active transport.

[2 marks]

transport against the concentration gradient/ from a low to a high concentration [1]

uses energy/ATP [1]

Use of a protein (pump) [1]

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How do microvilli and mitochondria help in the active transport of the products of digestion from the small intestine into the blood? [2 marks]

Microvilli larger surface area [1]

Mitochondria release/transfer/provide lots of energy (through aerobic respiration) [1]