Do not write outside the box

0 8 Diffusion is an important process in animals and plants.

0 8 . 1 What is meant by the term diffusion?

[2 marks]

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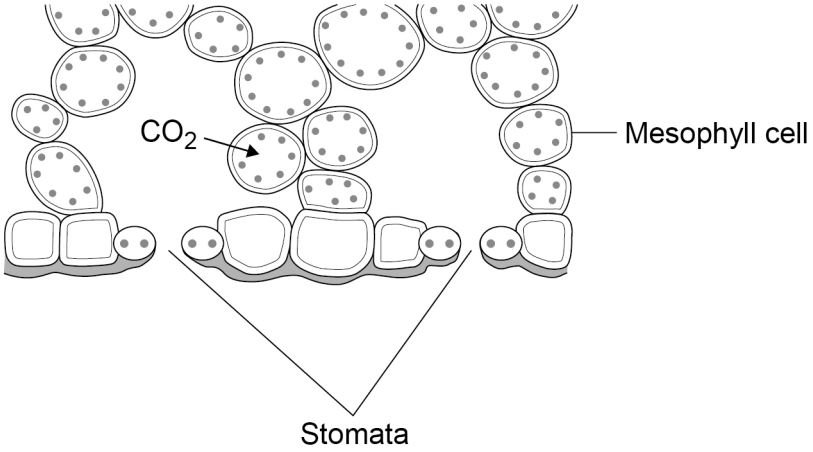
0 8 . 2 **Figure 11** shows part of a leaf.

Figure 11



Molecules of carbon dioxide diffuse from the air into the mesophyll cells.

Which **two** changes will increase the rate at which carbon dioxide diffuses into the mesophyll cells?

[2 marks]

Tick (✓) **two** boxes.

Decreased number of chloroplasts in the cells ☐

Decreased surface area of cells in contact with the air ☐

Increased carbon dioxide concentration in the air ☐

Increased number of stomata that are open ☐

Increased oxygen concentration in the air ☐

Question 8 continues on the next page

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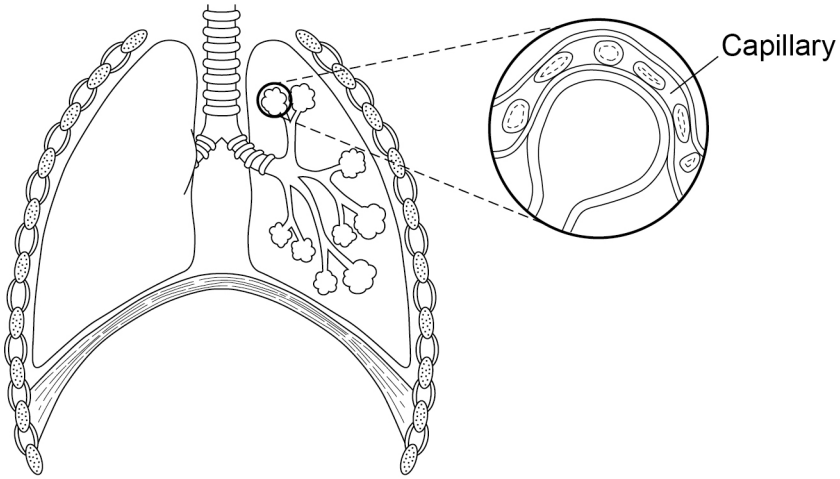
0 8 . 3 Diffusion also happens in the human lungs.

Figure 12 shows the human breathing system.

Figure 12



Explain how the human lungs are adapted for efficient exchange of gases by diffusion.
[6 marks]

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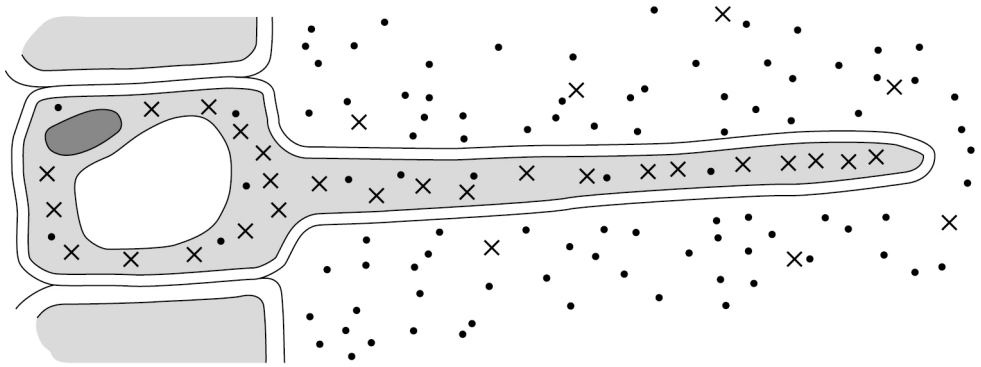
Figure 13 shows a root hair cell.

Figure 13



Key

Water molecules

Nitrate ions

0 8 . 4 Name the process by which water molecules enter the root hair cell.

[1 mark]

0 8 . 5 Nitrate ions need a different method of transport into the root hair cell.

Explain how the nitrate ions in **Figure 13** are transported into the root hair cell.

Use information from **Figure 13** in your answer.

[3 marks]

Name of process _____

Explanation _____

_____

_____

_____

_____

14

END OF QUESTIONS

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.1	movement / spreading out of molecules / particles	allow movement / spreading out of (named) substances / chemicals / gases / liquids ignore reference to membranes / cells	1	AO1 4.1.3.1
	from (an area of) high(er) concentration to (an area of) low(er) concentration	allow down / with the concentration gradient ignore along / across the concentration gradient do **not** accept movement from / to a concentration gradient	1	
08.2	increased carbon dioxide concentration in the air		1	AO2 4.1.3.1 4.2.3.2
	increased number of stomata that are open		1	

<table>
<tr><td rowspan="6">08.3</td><td>Level 3: Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.</td><td>5–6</td><td rowspan="6">AO1
4.1.3.1
4.2.2.2
4.2.2.3</td></tr>
<tr><td>Level 2: Relevant points (reasons/causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.</td><td>3–4</td></tr>
<tr><td>Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.</td><td>1–2</td></tr>
<tr><td>No relevant content</td><td>0</td></tr>
<tr><td colspan="2">Indicative content
• (many) alveoli
• provide a large(r) surface area (: volume)

• capillaries are thin
or alveoli / capillary walls are thin or one cell thick
or capillaries are close to the alveoli
• which provides short diffusion path (for oxygen / carbon dioxide)

• breathing (mechanism) moves air in and out
or lungs are ventilated
• to bring in (fresh) oxygen
• to remove carbon dioxide
• to maintain a concentration / diffusion gradient`

• large capillary network (around alveoli)
or good blood supply
• to remove oxygen(ated blood) quickly
• to bring carbon dioxide to the lungs quickly
• to maintain a concentration / diffusion gradient</td></tr>
</table>

08.4	Osmosis	allow diffusion	1	AO1 4.1.3.1 4.2.3.2 4.1.3.2
08.5	active transport (because) energy is needed (to move nitrate ions) from a low(er) concentration (in the soil) to a high(er) concentration (in the root / cell)	 allow (to move nitrate ions) against / up the concentration gradient allow (because) there is a lower concentration (of nitrate ions) in the soil **or** (because) there is a higher concentration (of nitrate ions) in the root / cell ignore reference to amount / number of nitrate ions ignore along / across the concentration gradient do **not** accept if reference to molecules / atoms moving	1 1 1	AO3 AO2 AO2 4.1.1.3 4.2.3.2 4.1.3.3
Total			**14**	