

Exchange surfaces & transport

Reading pages 17-22 both higher and foundation

Knowledge

1. What is diffusion?
2. Complete the table below to explain how exchange surfaces are often adapted for efficient transfer of substances:

Feature	How it helps efficient diffusion
Thin membranes	
Good blood supply	
Large surface area	

3. By which process does water move into and out of cells?
4. What is active transport?
5. Where does the energy needed for active transport come from?
6. Give an example of active transport in plants..... and in animals.....
7. Name 3 factors that affect the rate of diffusion.
8. Name 2 substances that can diffuse out of leaves through the stomata.
9. How do fish take in oxygen and excrete carbon dioxide?

Application

1. A cube is $3\mu\text{m} \times 3\mu\text{m} \times 3\mu\text{m}$. Calculate the surface area to volume ratio

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2. Explain why increasing the temperature increases the rate of diffusion.

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3. Describe, as fully as you can, how root hair cells take up mineral ions from the soil.

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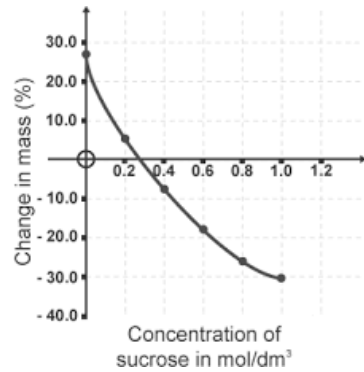
4. Explain why multicellular organisms need exchange surfaces such as the alveoli and the villi.

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- 5a) Explain why cylinders of potatoes expand when left in pure water

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5b) A student monitored the mass change in potatoes left in different concentrations of sugar solution. Her results are shown below:

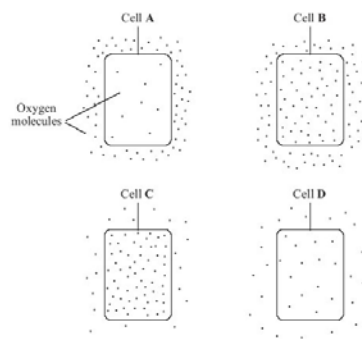


Estimate the concentration of sugar in the cells. Explain how you know.

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6. Into which cell below would oxygen move in the fastest? Explain your answer

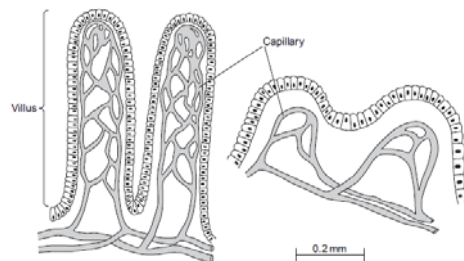


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Extend

The pictures below show the intestines of two people – one is suffering from coeliac disease and one is healthy



Explain why the person on the right may lose weight easily.

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