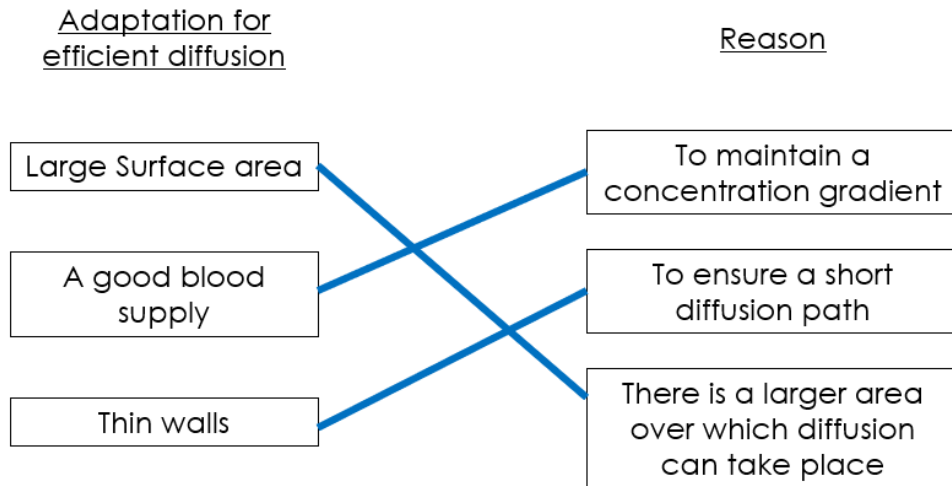


Diffusion in Living Things

1. Match the common adaptation for efficient diffusion to the corresponding reason on the diagram below:



2. The image shows a close up of an alveolus with its blood supply.

- a. Identify the gas that will diffuse from the alveolus into the blood.

Oxygen

- b. Identify the gas that will diffuse from the blood into the alveolus.

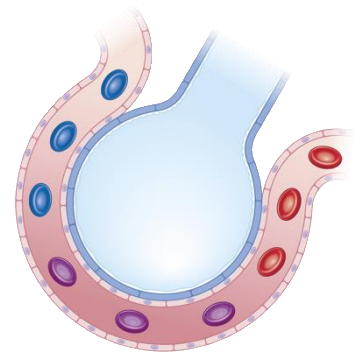
Carbon Dioxide

- c. Describe how this alveolus is adapted to allow efficient diffusion.

- **Only one cell thick – short path for diffusion.**
- **Good blood supply – maintains concentration gradient**
- **Large surface area**
- **(Moist – allows substances to dissolve before they diffuse)**

- d. Explain why efficient diffusion is important to the function of the alveolus.

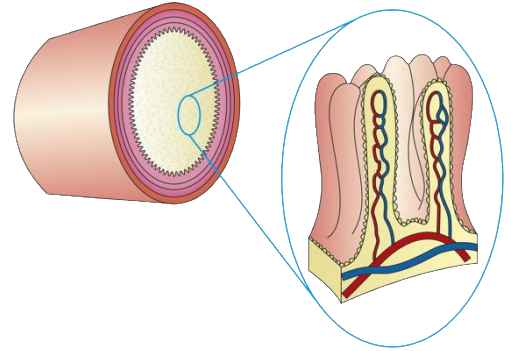
Needed to get oxygen into the body for cellular respiration and remove carbon dioxide as it is toxic to cells.



3. The image shows a close up of villi in the small intestine.

a. Identify a substance that will diffuse from the small intestine into the blood.

Glucose/sugar (or amino acids or fatty acids and glycerol)



b. Describe how these villi are adapted to allow efficient diffusion.

- **Large surface area due to shape.**
- **Efficient blood supply to maintain concentration gradient.**
- **Epithelial layer is only one cell thick – short path for diffusion**

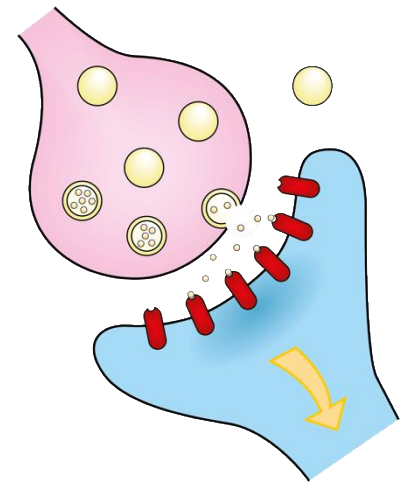
c. Explain why efficient diffusion is important to the function of the villi.

To get glucose into bloodstream and into cells to allow aerobic respiration to take place to produce energy for the body

4. The image shows a close up of a synapse.

a. Describe how this synapse is adapted to allow efficient diffusion.

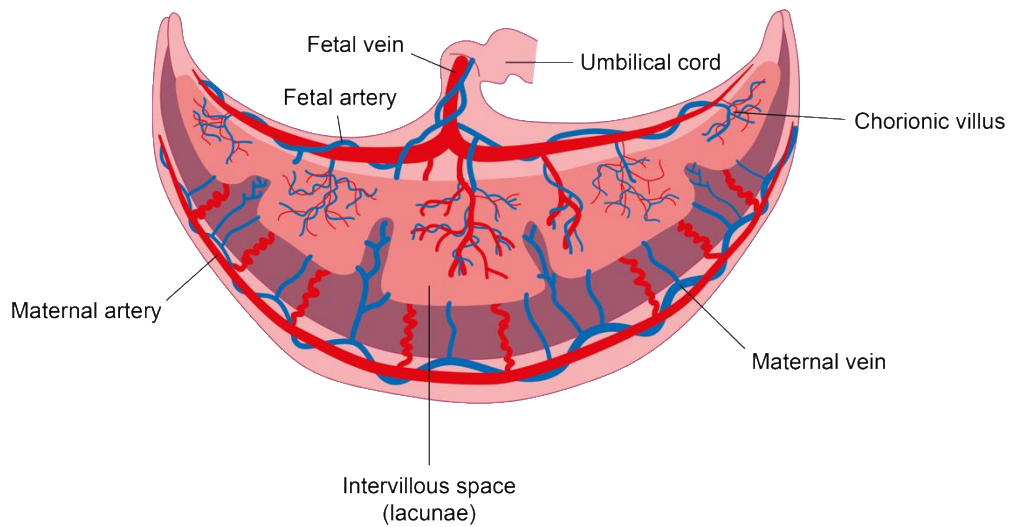
- **Small gap between neurons – short path for diffusion.**
- **Large surface area.**
- **Vesicles ensure chemicals are released to maintain concentration gradient.**



b. Explain why efficient diffusion is important to the function of the synapse.

Needed to convey messages and signals throughout the body for movement and response.

5. The image below shows a placenta. Describe how it is adapted to allow efficient diffusion.



- **Massive efficient blood supply to deliver oxygen and remove waste – foetus cannot remove waste on its own so it needs placenta to do this**
- **Large surface area**

Stretch activity: Diffusion of glucose from the small intestine into the bloodstream is not always possible. Discuss when and would this not be possible.

- **Diffusion needs a concentration gradient**
- **Cannot happen when there is no concentration gradient – i.e. concentration of glucose is the same in the bloodstream as it is in the small intestine**
- **Happens after diffusion has been happening for some time, e.g. hours after a meal.**