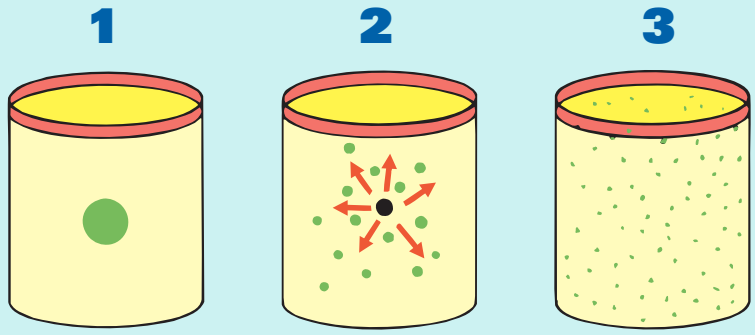
Absorption in the Small Intestine (Human): Passive Transport

Most of the absorption carried out by the digestive system occurs in the small intestine. The simple substances produced by digestion are small enough to be absorbed across the cell walls of the intestinal lining. This happens in one of two ways – by passive or active transport.

Passive transport: diffusion

Substances that can travel across the cell wall without requiring the cell to use any energy are said to be transported passively. In the digestive system, the main passive transport process is called diffusion.

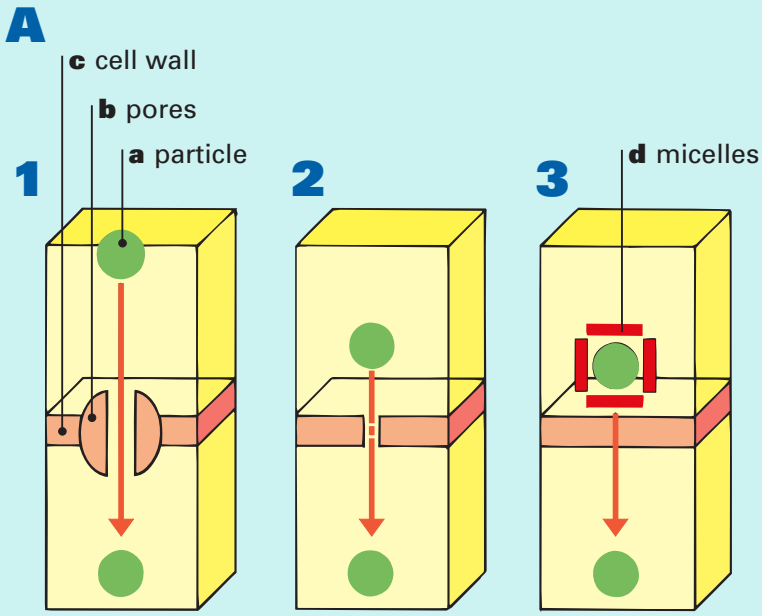
1–2 Particles in solution diffuse from an area where they are in high concentration to one where they are in low concentration, until
3 they are evenly distributed.



A Simple diffusion

A particle (**a**) can be transported by simple diffusion if:
1 it is small enough to pass through the pores (**b**) of the cell wall (**c**) or
2 it is lipid soluble (can be dissolved in fat), in which case it will pass directly through the lipid layer of the cell wall.
3 Some substances that float on the surface of the chyme (semifluid mixture of food and digestive juices) are coated with bile salts (secreted by the liver) to form micelles (**d**). These do not float and so sink to the cell's wall, through which they are easily diffused.

Digested substances absorbed by simple diffusion include:
- the end products of fat digestion – glycerol, monoglycerides and fatty acids;
- water-soluble vitamins (B and C); and
- water. (The simple diffusion of water across the cell wall is called osmosis.)



B Facilitated diffusion

If a particle is not lipid soluble and is too large to pass through the pores of the cell wall then it needs the help of a carrier protein.
1 The particle (**a**) binds to the protein (**b**), which straddles the cell wall (**c**).
2 The particle enters the cell through the protein.

Digested substances absorbed by facilitated diffusion include fructose (a sugar).