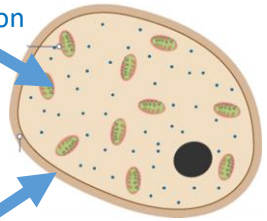
Biology: Respiration

Key word	Definition
Aerobic respiration	Glucose reacts with oxygen to release energy, carbon dioxide and water.
Anaerobic respiration	Glucose reacts without oxygen to release energy and lactic acid.
Lactic acid	Waste product of anaerobic respiration that causes muscle ache.
Oxygen debt	Not enough oxygen in the body after exercise.
Fermentation	Microorganisms convert glucose into ethanol, carbon dioxide and energy.
Diffusion	The net movement of particles from a high concentration to a low concentration.

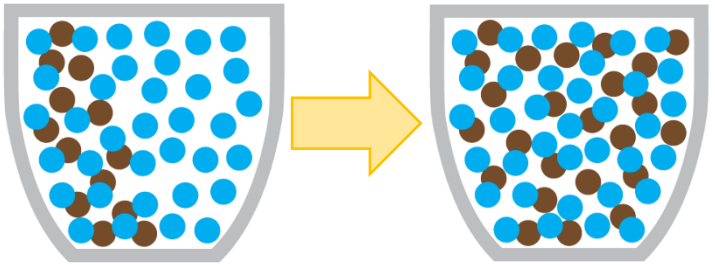
Mitochondria – the site of respiration



Substances diffuse across the cell membrane

Diffusion

- Oxygen from the air enters the lungs and **diffuses** into the blood.
- Glucose from our food enters the small intestine and **diffuses** into the blood.
- From the blood, both oxygen and glucose diffuse into cells to be used in **respiration**.



Aerobic respiration	Anaerobic respiration
Uses oxygen	Doesn't use oxygen
Uses glucose	Uses glucose
Produces carbon dioxide and water	Produces lactic acid
Releases more energy	Releases less energy

Exercise causes anaerobic respiration. **Lactic acid** builds up in the muscles. This causes pain and tiredness, and then cramp.

Uses of anaerobic respiration

- Yeast carry out fermentation.
- It produces ethanol (alcohol) – used for wine and beer.
- It also produces carbon dioxide – used for baking.

Aerobic respiration: Glucose + Oxygen → Carbon dioxide + Water (+ Energy)

Anaerobic respiration: Glucose → Lactic acid (+ Energy)

Fermentation: Glucose → Ethanol + Carbon dioxide (+ Energy)