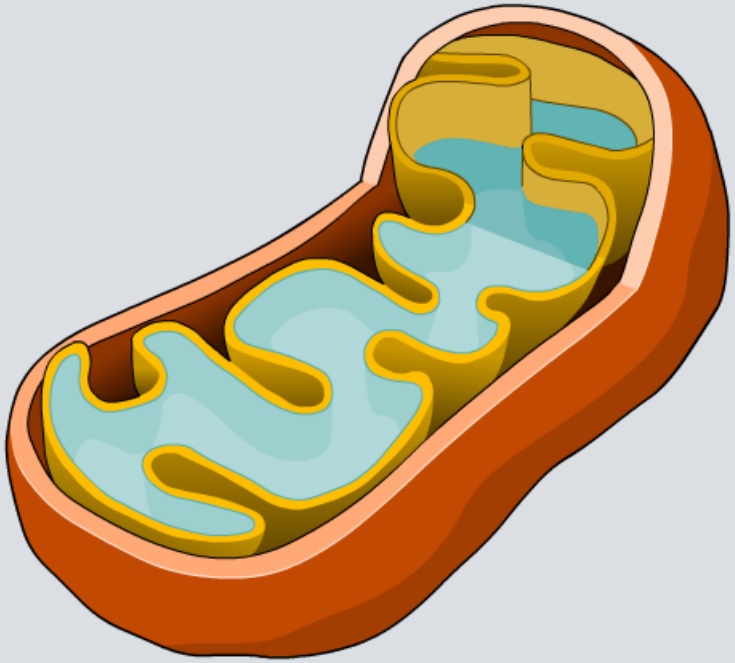
Aerobic Respiration



How do cells get their energy?

All organisms need energy to survive.

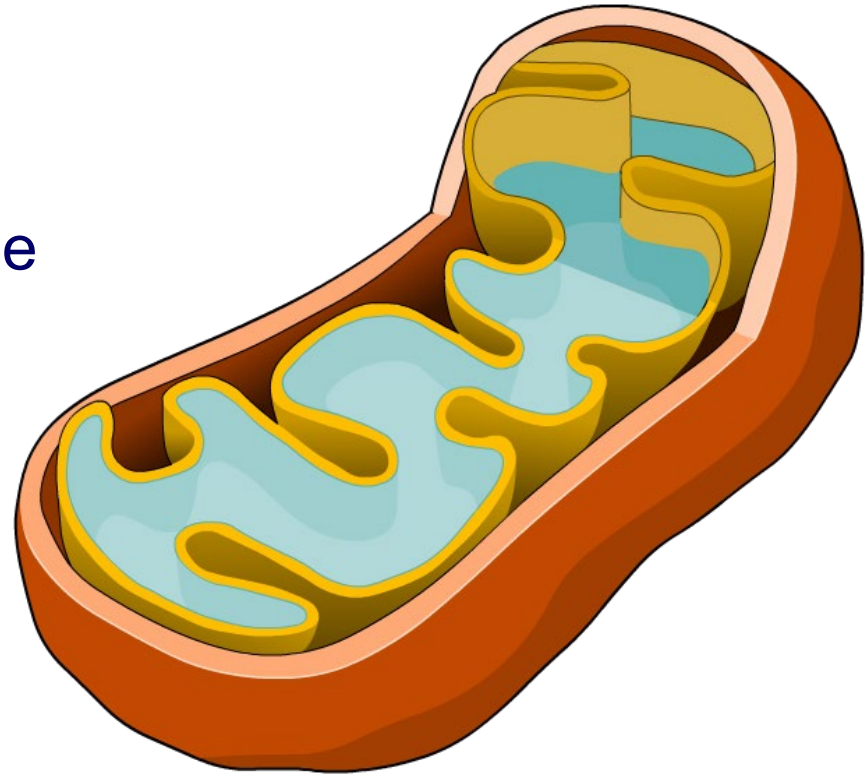
Animals obtain their energy from the food they eat, but plants can make their own food by photosynthesis.

In both cases, however, energy must first be converted into a form that can easily be used by cells. This process is called **respiration**.

Where does respiration take place?

Mitochondria are cellular organelles in which respiration takes place.

Mitochondria use enzymes to convert the energy from glucose into **ATP** – the basic energy source for all cells.



Mitochondria have an inner membrane on which the enzymes are embedded.

This membrane is highly folded to increase the surface area on which respiration can take place.

What is aerobic respiration?

Aerobic respiration is the process of releasing energy through the oxidation of glucose molecules.

Aerobic respiration is summarized by the equation:

glucose + oxygen → carbon dioxide + water (+ energy)

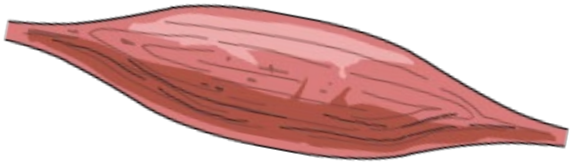
$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_20$ (+ ATP)

This reaction releases energy in the form of ATP – a compound that can readily be used in cellular processes.

How is energy used?

The chemical energy produced by respiration, ATP, is used by cells to undertake work.

Where might ATP be used?



- movement – enabling muscles to contract

- thermoregulation in mammals and birds
- biosynthesis – building new molecules, cells and tissues
- active transport – moving molecules against a concentration gradient.

Aerobic respiration