

# Breathing and respiration

## CORE KNOWLEDGE

name:

### Respiration

Respiration is a chemical reaction that happens in all cells. It releases energy from a sugar called glucose.

Aerobic respiration needs oxygen. It happens in the mitochondria of cells.



Anaerobic respiration happens without oxygen. It releases less energy than aerobic respiration and only takes place when there is not enough oxygen.

Anaerobic respiration in humans and animal cells:

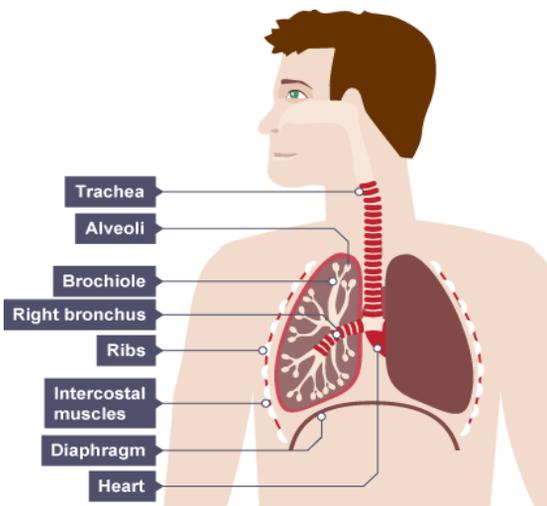


Anaerobic respiration in yeast cells:



### Gas exchange

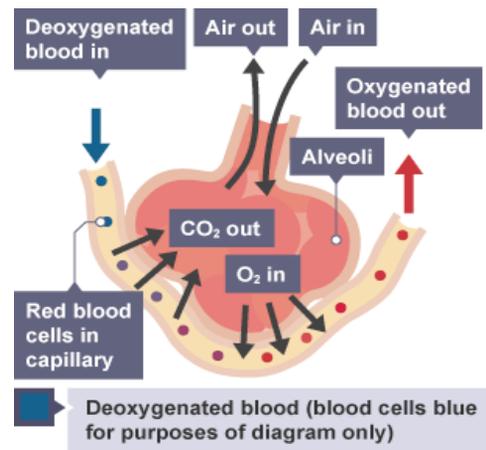
Oxygen from the air needs to diffuse into your bloodstream. Carbon dioxide from your blood needs to be removed. This process is called gas exchange.



Structure	Function
Ribcage	Protects the lungs.
Diaphragm	Muscle below ribcage. Moves up when it relaxes and down when it contracts.
Trachea	Where air is breathed in.
Bronchi	Trachea divides into 2 bronchi. Each lung has 1 bronchus.
Bronchioles	Bronchi split into smaller tubes called bronchioles.
Alveoli	Small air sacs at the end of each bronchiole. Where gas exchange occurs.

### The process of gas exchange in the lungs:

1. Air is inhaled.
2. Some oxygen from the air passes into the bloodstream for respiration.
3. The waste carbon dioxide from respiration passes out of the blood into the lungs and is breathed out.
4. The movement of oxygen into blood and carbon dioxide out of the blood happens by diffusion.



### 3 ways in which the lungs are adapted for gas exchange:

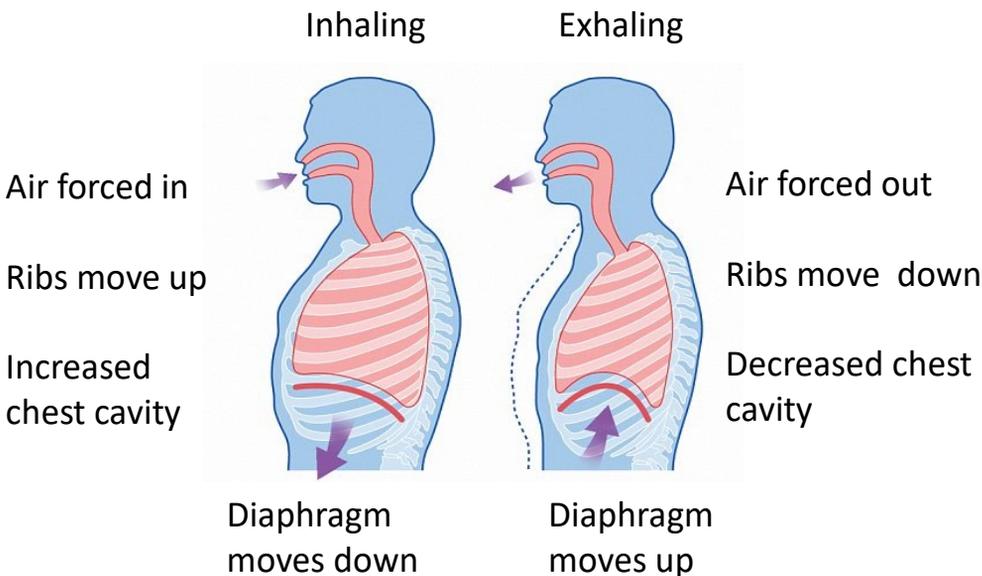
1. They are **moist**.
2. They have a **good blood supply**.
3. The **alveoli** have a **large surface area** for gases to diffuse across.

### Inhaling (breathing in):

1. Diaphragm moves down and intercostal muscles pull ribs up.
2. This increases the volume of the chest cavity.
3. Pressure inside the chest cavity decreases.
4. Air rushes in to fill up the lungs.

### Exhaling (breathing out):

1. Diaphragm moves up and intercostal muscles relax. Ribs move down.
2. This decreases the volume of the chest cavity.
3. Pressure inside the chest cavity increases.
4. Air is forced out of the lungs.



### Key words:

- Respiration
- Oxygen
- Glucose
- Lungs
- Alveoli
- Surface area
- Gas exchange
- Diffusion
- Carbon dioxide
- Diaphragm
- Inhaling
- Exhaling