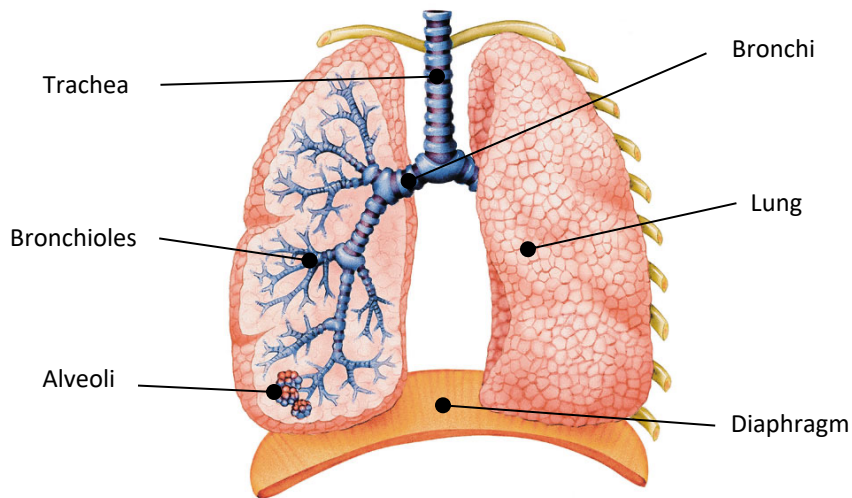


# Millthorpe School GCSE Physical Education – The structure and functions of the respiratory system

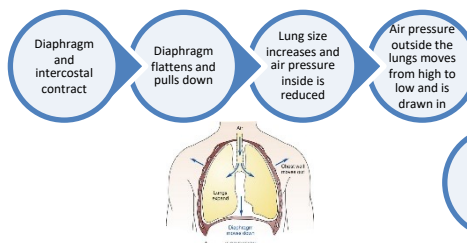
## Structure of the respiratory system



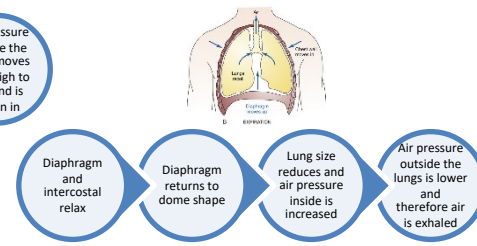
## Composition of inhaled and exhaled air

Gas	Inhaled air	Exhaled air
Oxygen	21%	16%
Carbon dioxide	0.04%	4%
Nitrogen	78%	78%

### Inhalation/Inspiration



### Exhalation/Expiration



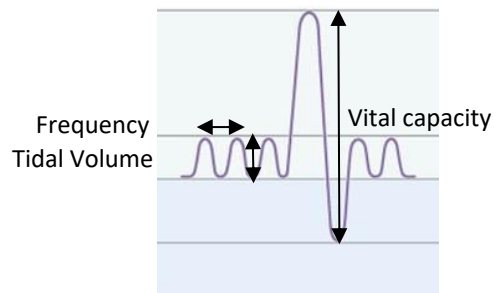
## Respiratory values

**Tidal Volume** – the amount of air inhaled and exhaled per breath. Resting value = 500ml

**Vital Capacity** – The maximum amount of air exhaled following a maximal breath in.

**Frequency** – The number of breaths taken per minute. Resting value – 12-20 breaths.

**Minute Ventilation** – The amount of air inhaled and exhaled per minute. Measured in litres.

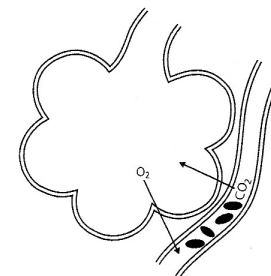


## Gaseous exchange at the alveoli

- Diffusion is the movement of molecules from an area of high concentration to a low one.
- The alveoli have thin moist walls to allow diffusion to occur.
- Capillaries are closely wrapped around the alveoli to reduce the distance of diffusion and increase efficiency.

During inhalation:

- The concentration of **oxygen** in air is higher than the alveoli.
- The concentration of **carbon dioxide** in the blood is higher than that in the air.



## During exercise

Gaseous exchange increases as the intensity of the activity increases to cope with:

- An increase demand for oxygen at working muscles
- An increase in carbon dioxide production and the need to rid this waste product.

Frequency ↑ + Tidal Volume ↑

Training increases total lung capacity and vital capacity readings.

