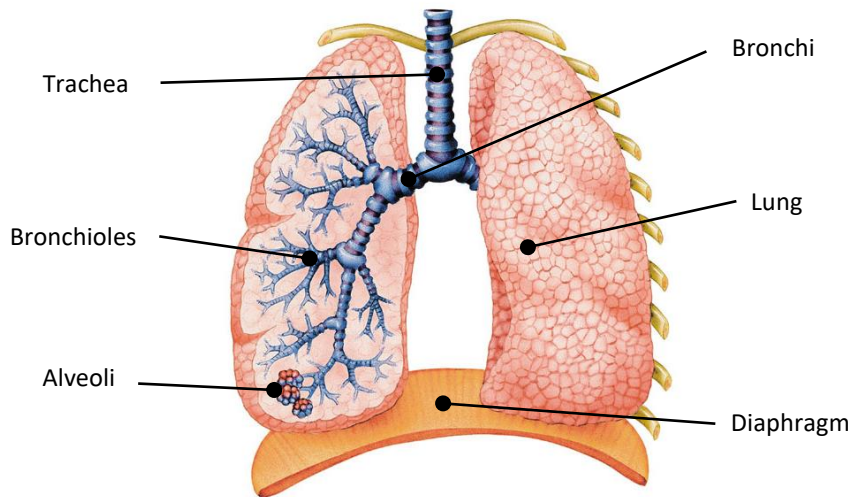


GCSE Physical Education – The structure and functions of the respiratory system

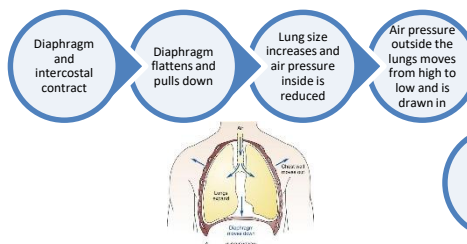
Structure of the respiratory system



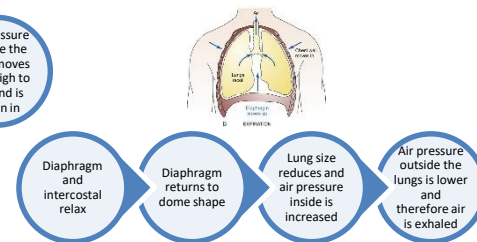
Composition of inhaled and exhaled air

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

Inhalation/Inspiration



Exhalation/Expiration



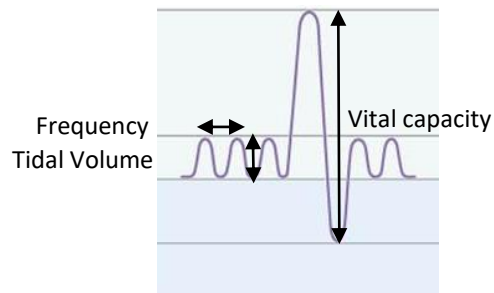
Respiratory values

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.

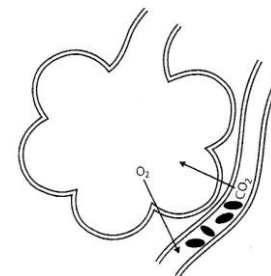


Gaseous exchange at the alveoli

- 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.

