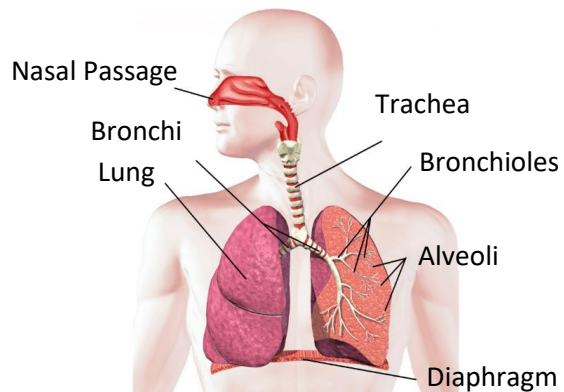




A: Structure of the respiratory system



Pathway of Air



A: Composition of inhaled and exhaled air

Gas	Inhaled Air	Exhaled Air
Oxygen	21%	16%
Carbon Dioxide	0.04%	4%
Nitrogen	79%	79%

A: Inspiration

- Diaphragm and intercostal muscles contract
- Diaphragm moves down and rib cage moves up and out
- Chest cavity increases in size which causes a decrease in pressure
- Air moves from high pressure (outside) to low pressure (inside the lungs)

A: Expiration

- Diaphragm and intercostal muscles relax
- Diaphragm returns to dome shape
- Lung size decreases and air pressure inside increases
- Air pressure outside the lungs is lower than inside therefore the air moves from inside to the lungs to outside.

A: Key terms

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

Breathing Rate – The number of breaths taken in a Minute

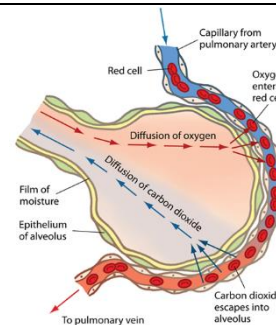
Minute Volume – The amount of air inhaled and exhaled per minute. Measured in litres.

B: Gaseous exchange at the alveoli

- The alveoli have thin moist walls to allow diffusion to occur.
- Capillaries are one cell thick and are closely wrapped around the alveoli to reduce the distance of diffusion and increase efficiency.

During inhalation:

- Oxygen is diffused into the capillaries from the alveoli
- Carbon Dioxide is diffused out of the capillaries into the lungs to be exhaled



C: Aerobic Respiration

When you exercise at a steady, comfortable rate, the cardiovascular system is able to supply the muscles with all the oxygen they need. Under these conditions, **aerobic respiration** takes place.
glucose + oxygen → carbon dioxide + water

C: Anaerobic Respiration

When you exercise at a high intensity, the cardiovascular system cannot supply enough oxygen to the muscles. Under these conditions, **anaerobic respiration** takes place.
glucose → lactic acid

C: 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.

Regular exercise can increase the lungs tidal volume and minute ventilation