

Knowledge Organiser- Unit 1- Body Systems- Respiratory System

The Pathway of Air into the Body

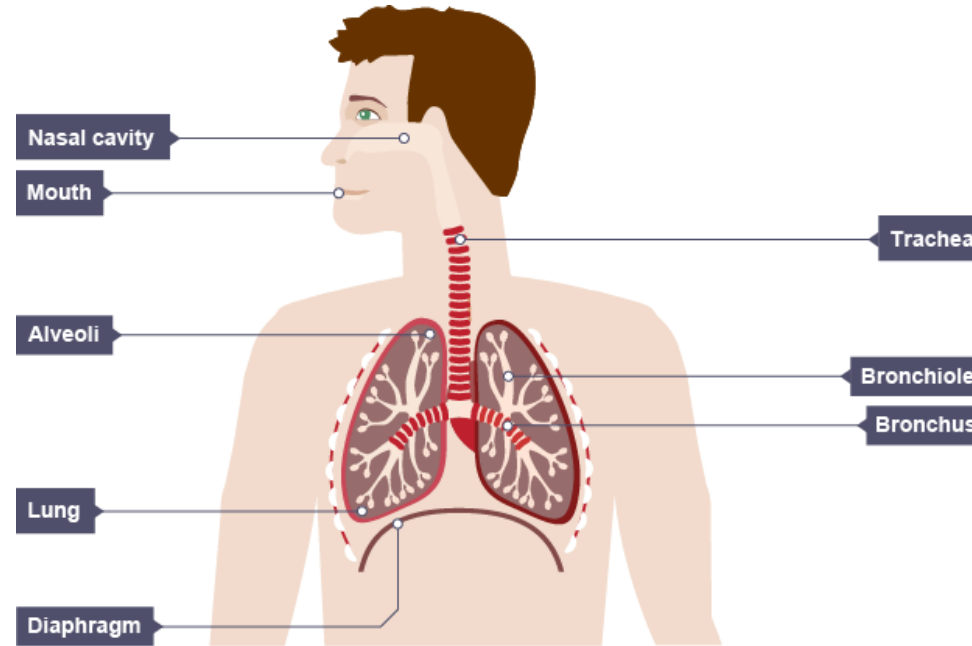
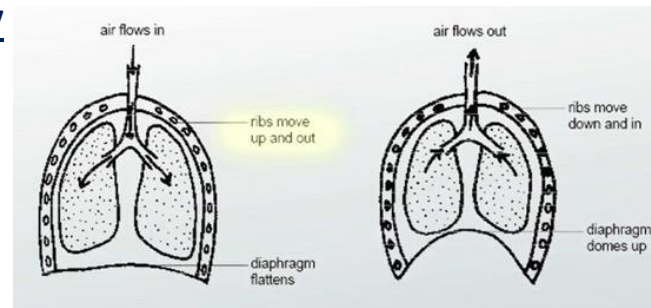
When we breathe in, air moves through the mouth and nose.

It then travels down the trachea. The inner surface of the trachea is covered in tiny hairs called CILIA, which catch particles of dust. The trachea is kept open by RINGS OF CARTILAGE. Near the lungs the trachea divides into two tubes called bronchi (one enters left lung and the other the right).

Once in the lungs the bronchi split into smaller bronchi before dividing into even smaller tubes called bronchioles.

At the end of each bronchiole are openings to the alveoli. There are usually several alveoli coming from one bronchiole, forming a little clump that resembles a cluster of grapes.

At the alveoli gaseous exchange occurs. Capillaries carrying blood surround each alveoli resulting in oxygen being passed into the bloodstream from the alveoli in exchange for carbon dioxide which passes from the blood stream into the alveoli.



During Exercise the following happens:

- 1) Respiratory rate - Increases
- 2) Tidal volume – increases
- 3) Minute Volume= increases
- 4) Residual volume = stays the same.
- 5) Expiratory reserve volume (ERV) = decreases
- 6) Inspiratory reserve volume (IRV) = decreases

Alveoli:

These are small air sacs found in the lungs.

This is where gaseous exchange takes place within the respiratory system. Oxygen enters the blood stream to be sent to the heart.

Carbon dioxide replaces the oxygen (**exchanged**) in the alveoli so that it can be removed from the body.

Key Features of alveoli:

Alveoli walls are only one cell thick and are moist – easy to exchange gases
They are very small, however there are millions within the lungs – large surface area
Covered with huge network of capillaries – constant blood supply

Key Terms:

Respiratory rate - breathes per minute
Tidal volume – amount of air inhaled / exhaled per breath
Minute Volume= Respiratory Rate x Tidal Volume– amount of air inhaled per minute
Residual volume = the volume of air that remains in the lungs after maximal expiration.
Expiratory reserve volume (ERV) = the additional air that can be forcibly exhaled after the expiration of a normal tidal volume.
Inspiratory reserve volume (IRV) = the additional air that can be forcibly inhaled after the inspiration of a normal tidal volume.

Inspiration / Expiration

Inspiration (How we breathe in):

- The diaphragm contracts and flattens.
- The intercostal muscles contract which causes the rib cage to rise.
- Both these actions cause the chest cavity to increase in size / volume.
- This reduces the pressure in the chest cavity, due to this the air passes from the higher pressure outside of the lungs to the lower pressure inside the lungs.
- This causes the lungs to expand and fill the chest cavity

Expiration (How we breathe out):

- The diaphragm relaxes and bulges up, returning to its original dome shape.
- The intercostal muscles also relax causing the ribs cage to lower.
- Both these actions cause the chest cavity to decrease in size / volume.
- The reduction in the size of the chest cavity increases the pressure of the air in the lungs and causes it to be expelled.
- The air passes from the high pressure in the lungs to the low pressure in the bronchi and trachea.