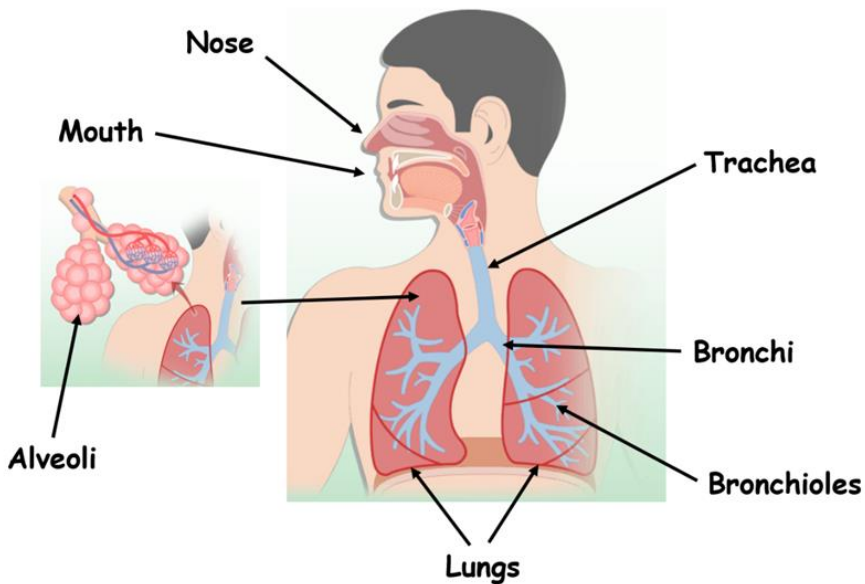


# The structure and functions of the cardio-respiratory system (part 1)

## The pathway of air into the lungs:



**Nose and mouth:** Air enters the body through the nose and mouth

**Trachea:** Air from the nose and mouth enters the wind pipe called the trachea. The trachea is surrounded by rings of cartilage to keep its shape and prevent it collapsing

**Bronchi:** Air travels from the trachea and to each lung via a bronchus. Bronchi is the term for both the left and right bronchus. The passage of air gets smaller and smaller

**Bronchioles:** The smaller airways that branch off the bronchi are called bronchioles. Bronchioles branch out throughout the lungs and carry the air from the bronchi to the alveoli

**Alveoli:** The bronchioles carry the air to the alveoli which are tiny air sacs. They are attached to the bronchioles. The exchange of oxygen and carbon dioxide occurs at the alveoli

## Gaseous exchange

### Features that assist in gas exchange

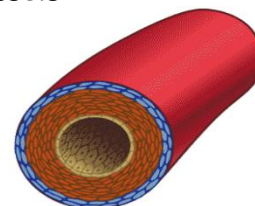
- Alveoli have very tiny air sacs with moist thin walls (only one cell thick)
- Alveoli have a very large surface area
- Alveoli are surrounded by capillaries
- It provides a large blood supply



## Gaseous exchange

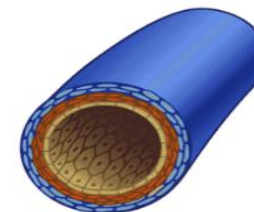
- Gases move from areas of high concentration to areas of low concentration. If there is more oxygen in the alveoli than the capillaries oxygen will move into the capillaries
- Oxygen is diffused into the blood. It binds with the **haemoglobin** in the blood to form **oxyhaemoglobin**
- Oxyhaemoglobin is transported to the working muscles where it is used for aerobic activity
- During aerobic activity carbon dioxide is produced this is removed from the muscles by haemoglobin
- Gaseous exchange occurs at the alveoli - capillaries and capillaries - muscle tissue

## Blood vessels:



**Artery**

- Thick muscular walls
- Thick elastic walls
- Small lumen (internal diameter)
- Carry blood at high pressure
- Carry blood away from the heart
- Usually carry oxygenated blood (except the pulmonary artery)



**Vein**

- Thin walls
- Large lumen (internal diameter)
- Carry blood at low pressure
- Contain valves
- Mainly carry deoxygenated blood (except the pulmonary vein)



**Capillary**

- Very thin walls (one cell thick)
- Small lumen (internal diameter)
- Link smaller arteries with small veins
- Allow gaseous exchange
- Carry blood at low pressure

## Redistribution of blood:

When we exercise blood is redistributed. The working muscles need more oxygen than other inactive areas of the body such as the stomach. Blood is diverted away from inactive areas to the working muscles.



**Vasoconstriction** means that the blood vessels constrict to make them smaller. Chemical changes signal the nervous system to **constrict** blood vessels to **inactive** areas.



**Vasodilation** means that the blood vessels dilate to make them bigger. Chemical changes signal the nervous system to dilate blood vessels that supply active areas.