

## Chapter 5: Respiration and Breathing

### Respiration

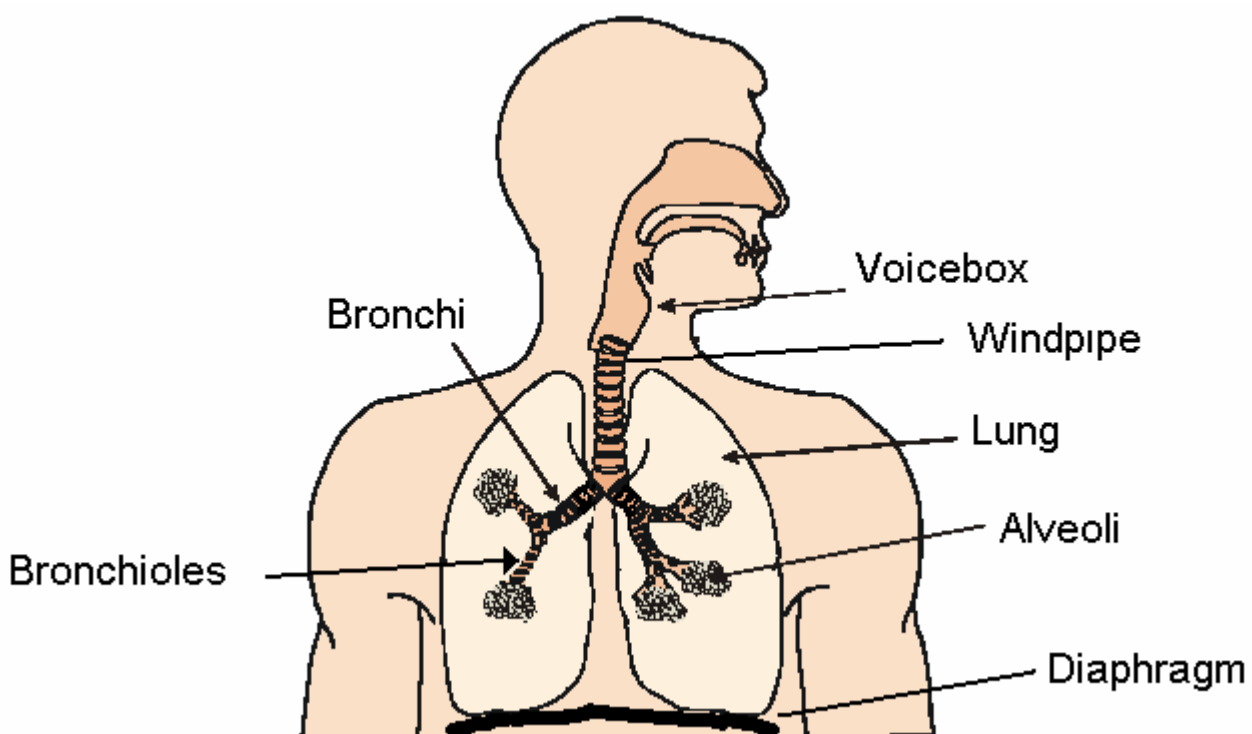
**Def: Respiration is the release of energy from food.**

When the food is broken up in the digestion system, it gets absorbed into the blood stream and travels to the cells. It reacts with the oxygen we breathe in and energy is given out (along with carbon dioxide and water vapour). We use this energy to survive.

Glucose + Oxygen  $\longrightarrow$  Energy + Carbon Dioxide + Water Vapour

**Aerobic respiration** = process where living things use food and oxygen to release energy.

### The Respiratory System.



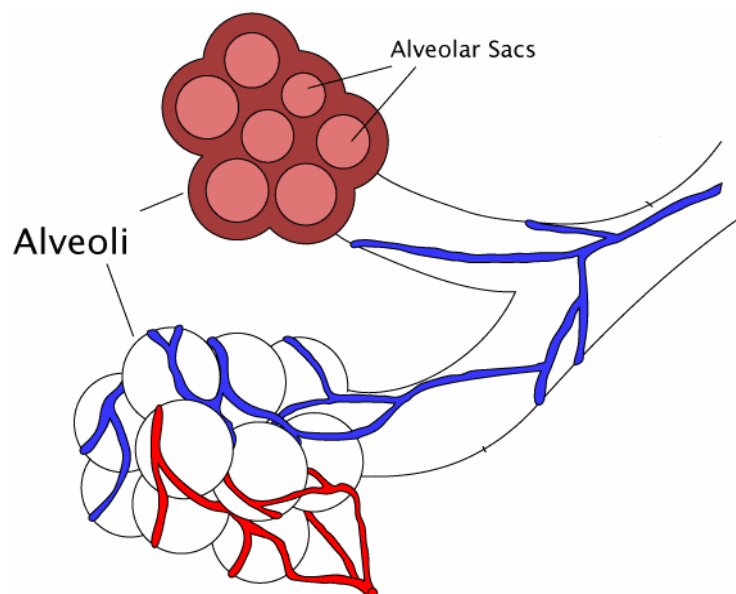
- Air comes in through the nose and mouth
- It travels down the **windpipe** to the two **bronchi** (tube from windpipe to lungs)
- These branch out into the **bronchioles** (small pipes inside the lungs)
- They finish up at the **alveoli** (small air sacs surrounded by blood vessels)
- The windpipe, bronchi and bronchioles have rings of **cartilage** to keep them open.

Air gets sucked in by a very strong muscle below the lungs called the **Diaphragm**. When it moves down it pulls air in and moves up, it pushes air out.

## Gas Exchange.

Gas exchange occurs in the alveoli. The walls of the alveoli are only one cell wall thick and contain tiny blood vessels called **capillaries**. Here, oxygen that is in the air we breathe in gets taken in through the capillaries to the blood stream. Cells take the oxygen from the blood and use it for respiration.

The waste produced in the cell, carbon dioxide and water vapour, gets passed out into the blood stream. It moves into the alveoli so it can be breathed out.



Air in – rich in oxygen

Air out – rich in carbon dioxide and water vapour.

## Smoking.

Smoking causes lung cancer.

- The smoke damages the lungs making them produce mucus which is difficult to clear. This could lead to diseases such as **bronchitis** or **emphysema**.
- **Heart attacks.** Cigarette smoke contains carbon monoxide which replaces the oxygen in our blood. Because of this lack of oxygen, smokers breathe faster and therefore put more stress on the heart.
- Smoking during pregnancy **stunts growth** because the unborn baby is being starved of oxygen. It also affects teenagers because they are not fully developed.