Respiration and Breathing

Respiration and Breathing

- Respiration and Breathing are 2 very different process
- **Respiration** is the release of energy from food
- **Breathing** is when we breathe in Oxygen and breathe out Carbon Dioxide

Respiration

There are 2 types of respiration

1. Aerobic Respiration – needs oxygen to release energy from food

2. Anaerobic Respiration – doesn't need oxygen to release energy from food

Aerobic Respiration

- Respiration happens in every cell in our body
- Blood carries food to every cell in our body
- Blood also carries oxygen to every cell
- Food and oxygen join together to release energy (Respiration)

- Some of the energy is used by the cells and some of the energy is lost as heat
- The waste products of respiration are carbon dioxide and water vapour
- These products are carried to the lungs by the blood and breathed out

Aerobic Respiration Equation

Food + Oxygen → Energy +

Carbon Dioxide + Water

Vapour

Water Vapour is a waste product of Respiration

- Breathe onto a glass slide, allowing condensation to form
- Place Cobalt Chloride paper onto the glass slide
- Cobalt Chloride paper turns pink when water vapour is present

Carbon Dioxide is a waste product of Respiration

- Blow bubbles into a test tube of limewater through a straw for a few minutes
- Limewater turns a milky colour when Carbon Dioxide is present

To compare the levels of Carbon Dioxide in inhaled air v exhaled air

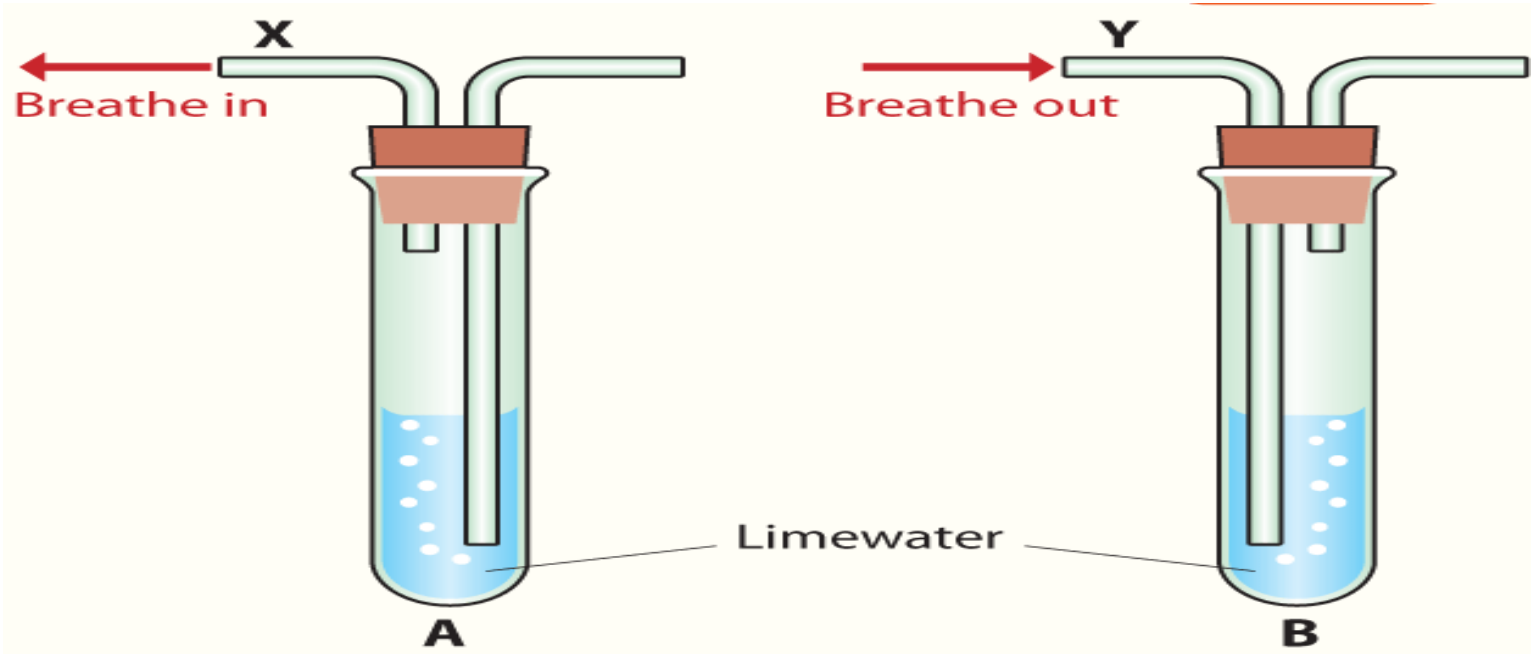


Fig 5.12 Testing for carbon dioxide in inhaled and exhaled air

- Breathe in through tube X (inhaled air)
- Breathe out through tube Y (exhaled air)
- Continue for 1 min
- Test tube A (tube X) will stay the same
- Test tube B (tube Y) will turn milky

Result:

- There is more Carbon Dioxide in exhaled air than inhaled air.
- The exhaled air turned limewater milky
- The inhaled air caused the limewater to remain clear

The Breathing System

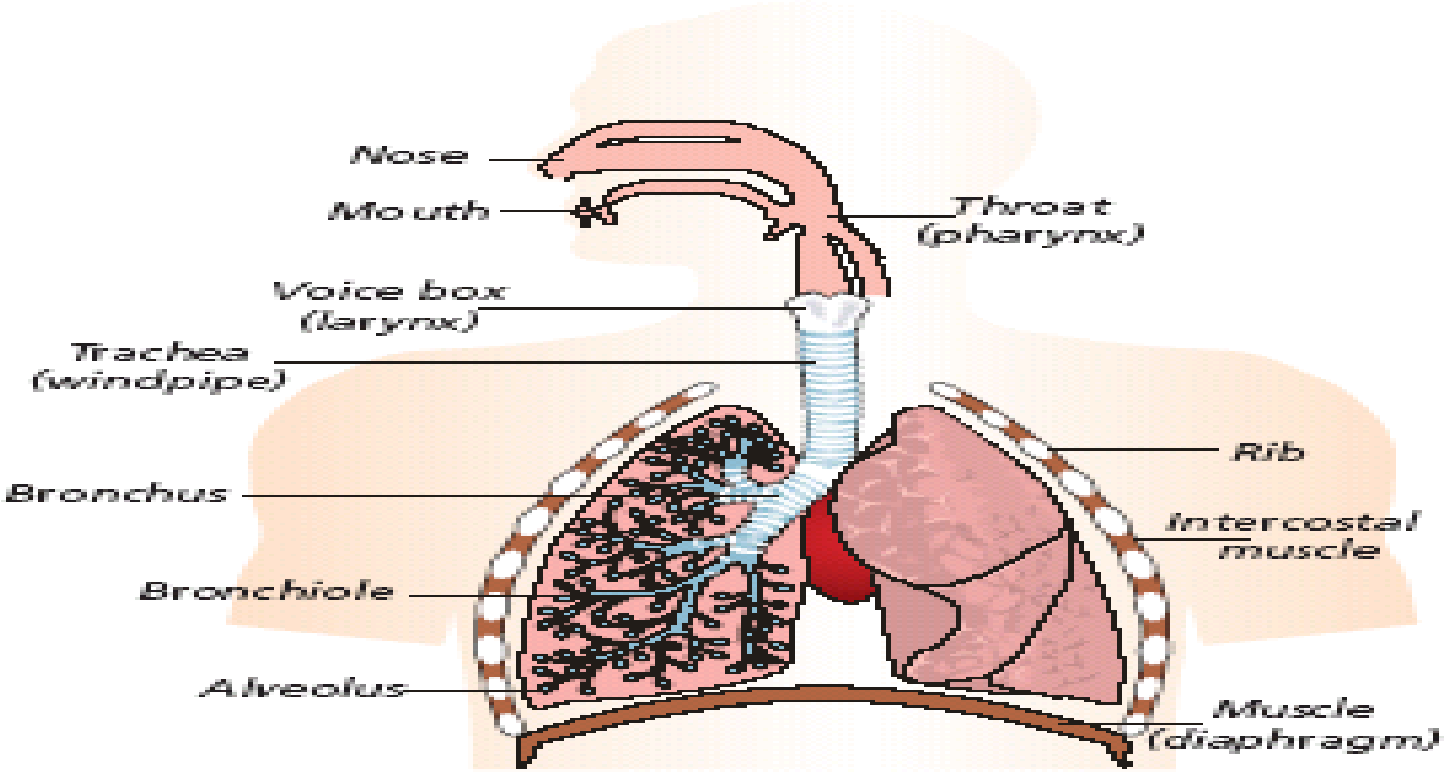


Fig. 5.6
The breathing (respiratory) system

The parts of the Breathing System

The Nose

- We breathe air in through our nose
- Hairs on the inside of or nose trap dirt and bacteria
- Air is warmed up and moistened in the nose

The Mouth

- We breathe air in through the mouth

The Trachea (Windpipe)

- The trachea carries air from our mouth and nose down to our lungs
- Rings of cartilage line the trachea to keep it strong so it doesn't collapse

The Bronchus

- We have 2 **Bronchus**
- They carry air from the trachea into each lung

The Bronchioles

- The Bronchus divides up into smaller tubes called **Bronchioles**
- The **Bronchioles** carry air to the alveoli

The Alveoli

- Alveoli are small structures found at the end of each bronchiole
- They allow oxygen and carbon dioxide to swap places in the lung.

The Diaphragm

- The Diaphragm is a sheet of muscle at the base of the chest
- It helps air to move into and out of the lungs

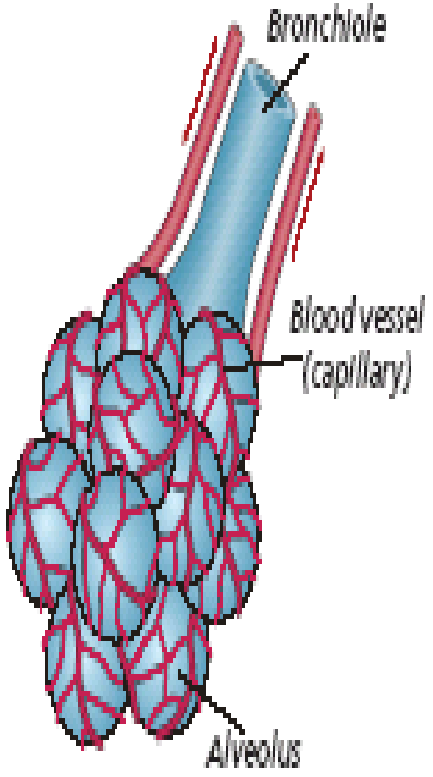
Intercostal Muscles

- Are muscles found between our ribs
- Intercostal Muscles help air to move into and out of our lungs

Gas Exchange in the Alveoli

- The Alveoli are surrounded by a rich supply of capillaries which carry blood

- Capillaries are only one cell thick and are very thin so oxygen and carbon dioxide can pass easily though the walls of the capillaries into and out of the alveoli.



- Oxygen in the air passes from the alveoli into the capillaries and brought to all the cells in the body by the blood.
- At the same time Carbon Dioxide and Water Vapour (waste from the cells in the body) is passed from the blood in the capillaries into the alveoli.
- The Carbon Dioxide and Water Vapour go back up the Bronchioles, the Bronchus, the Trachea and out of the body through the mouth and nose

The effects of smoking

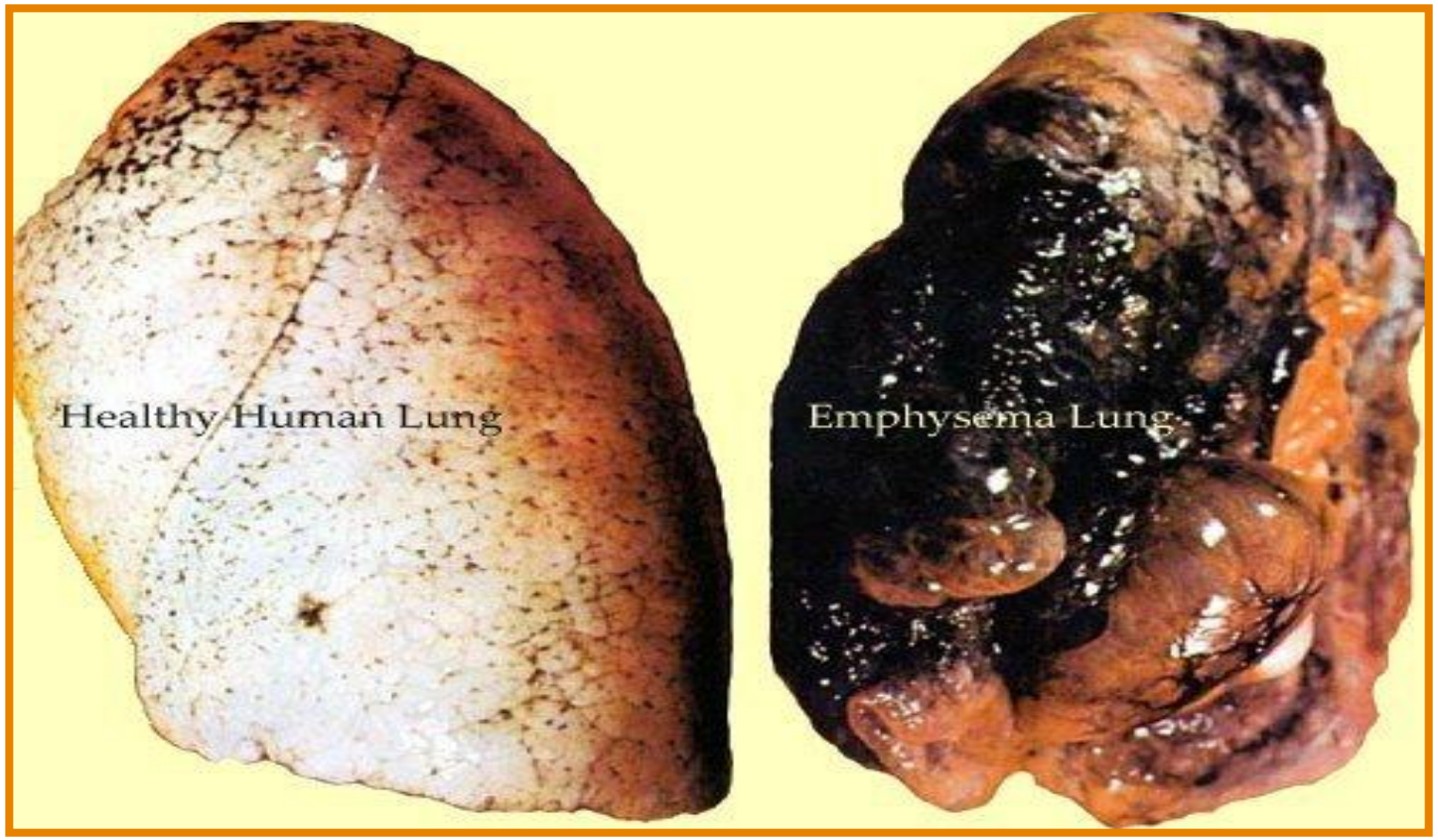
1. Smoking causes lung cancer
2. You get a smoker's cough
3. Smoking increase the risk of getting Pneumonia and Bronchitis

Smoking statistics

This year in Ireland:

- 5000 smokers will die from smoking related diseases (14 per day).
- Smoking causes 75% of all cases (550) of Bronchitis
- Smoking causes 25% of all heart disease cases (8500)
- Causes 33% of all cancer deaths (8000)

Healthy Lung v Smoker's Lung



Have you ever wondered why African marathon Athletes are generally more successful than those from other continents???

It's because they train at greater humidity with less oxygen available to them and their body adapts to this environment

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