

The Respiratory System



Objectives

- Name and locate the main features of the respiratory system
- Explain the basics about the respiratory system

Air is drawn in through the nose, where it is filtered by tiny hairs and warmed and moistened by **mucus**.

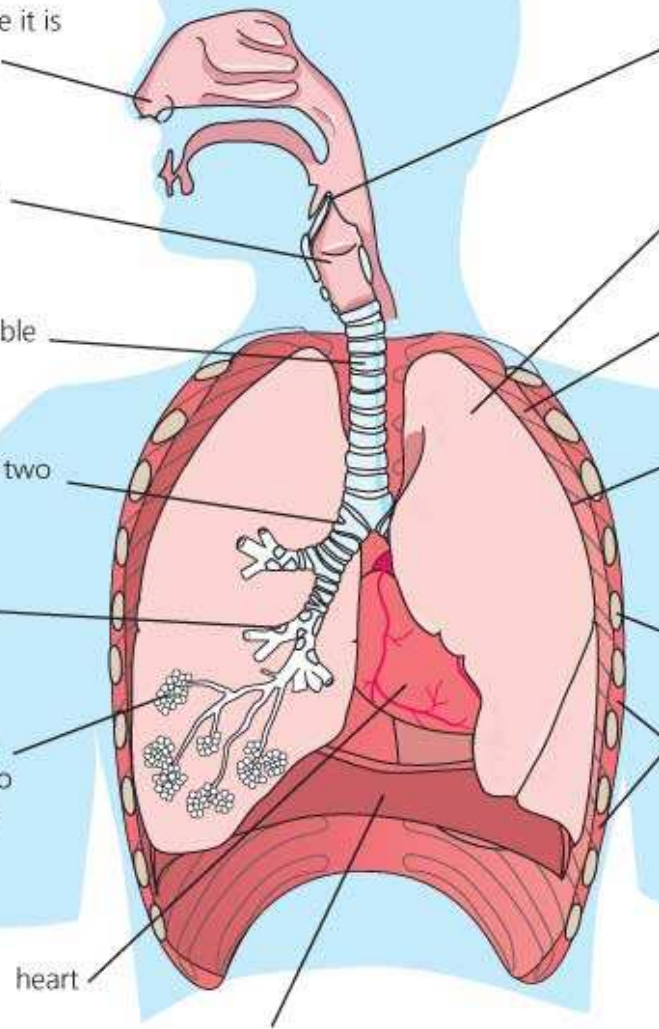
The voice box or **larynx**, which makes sounds for speaking.

The windpipe or **trachea**. This is a flexible tube held open by rings of cartilage.

In the lungs, the trachea branches into two **bronchi**. Each is a bronchus.

The bronchi branch into smaller tubes called **bronchioles**.

The bronchioles end in bunches of tiny air sacs called **alveoli**. Their walls are so thin that gases can pass through them.



A small flap of cartilage stops food going into the windpipe instead of the gullet. It is called the **epiglottis**.

The **lungs** are soft and spongy.

The lungs are in a space called the **thoracic cavity**.

The **pleural membrane** is a slippery skin lining the cavity. It protects the lungs as they rub against the ribs.

The **ribs** protect the lungs.

The **intercostal muscles** between the ribs help you breathe in and out.

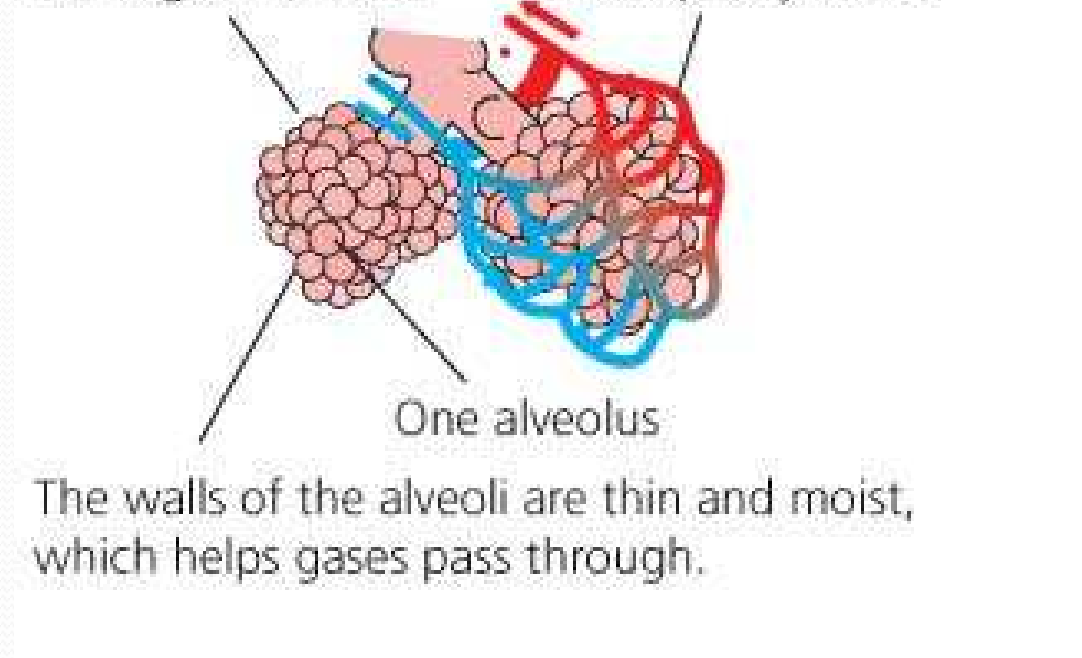
heart

The **diaphragm** is a sheet of muscle below the lungs. It helps you breathe in and out.

Gaseous Exchange in the Alveoli

These are the alveoli at the end of a bronchiole. Each is smaller than a grain of salt.

The alveoli are covered with tiny blood vessels called capillaries. Gases can pass through the capillary walls.



1 Blood carries waste carbon dioxide from the body cells to the alveoli.

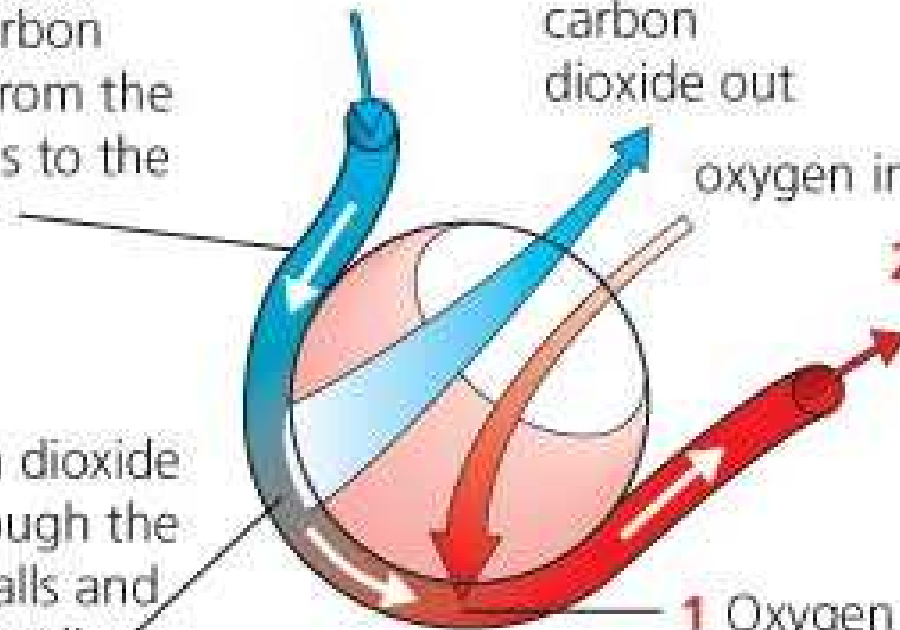
2 The carbon dioxide passes through the capillary walls and into the alveoli.

3 The carbon dioxide travels out of the lungs and up the windpipe. You breathe it out.

carbon dioxide out
oxygen in

2 The blood carries the oxygen away to the body cells and muscles.

1 Oxygen passes through the alveoli walls and into the capillaries.



How air changes in your lungs

Substance	Amount in Inhaled Air	Amount in exhaled air
Oxygen	21%	17%
Carbon Dioxide	A tiny amount	3%
Nitrogen	79%	79%
Water	little	more



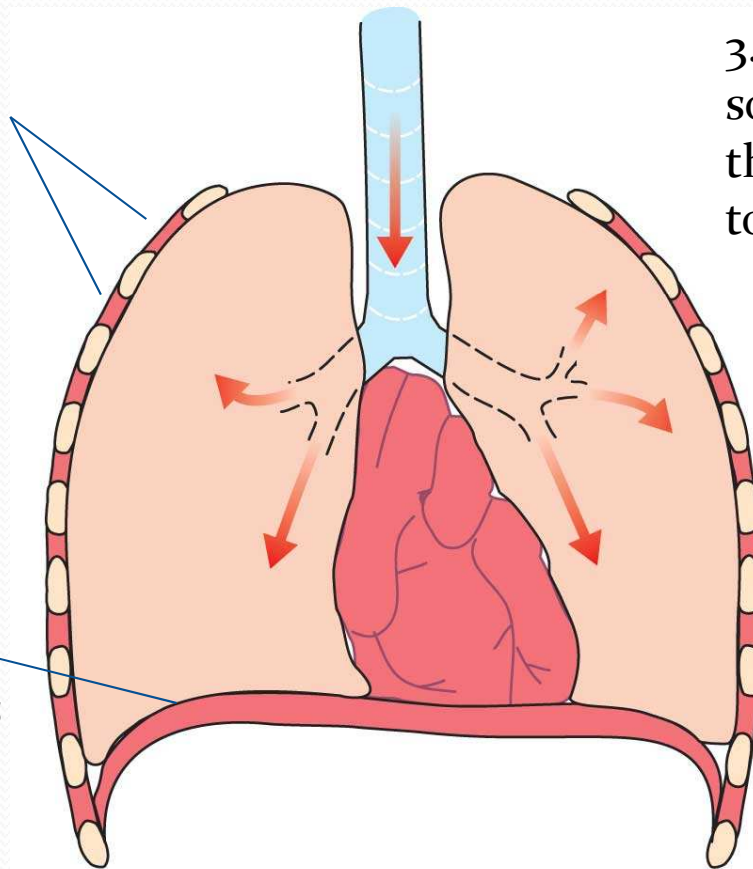
Questions

- Answer the questions on page 111

Inspiration – Breathing in

1. The **intercoastal muscles** contract. Pulling the rib cage upwards. The chest expands

2. The **diaphragm** contracts. This pulls it down and flattens it making the chest even larger



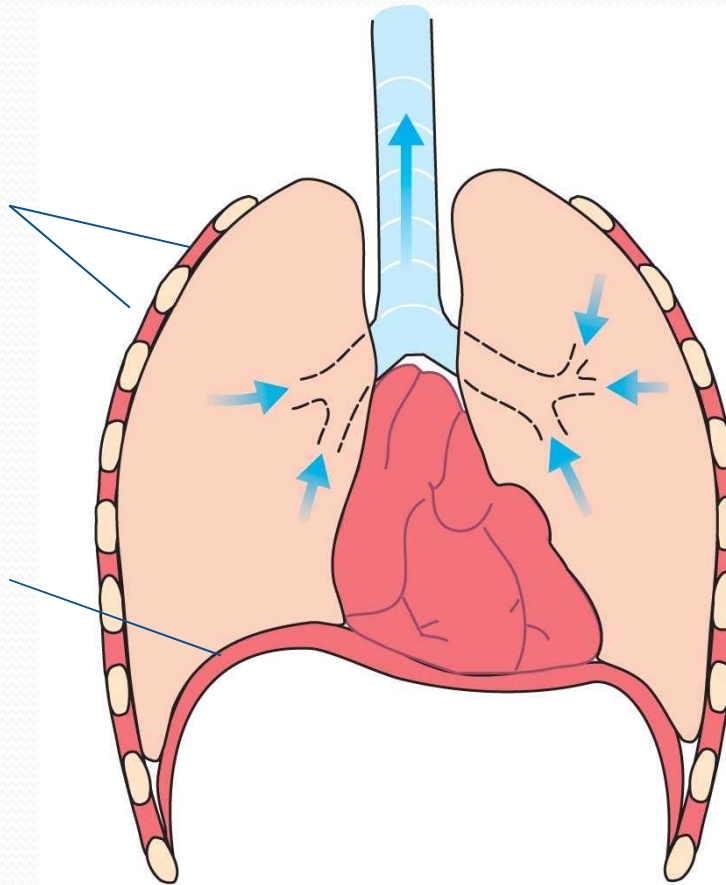
3. When the chest expands so do the lungs, because their moist surface clings to the chest lining

4. When the lungs expand the pressure inside them falls, so more air is sucked down the windpipe and into the lungs

Expiration – Breathing out

1. The intercostal muscles relax. This lowers the rib cage and makes the chest smaller

2. The diaphragm relaxes so that it bulges upwards again. This makes the chest even smaller



3. When the chest gets smaller the lungs are compressed. So the air is pushed out of the lungs and up the windpipe