

5. The Respiratory System

The respiratory system takes in oxygen and removes carbon dioxide and some water from the body.

The respiratory system is made up of:

- ✎ The airways: transport gases to and from the lungs.
- ✎ The lungs: where gases are exchanged with the blood.
- ✎ The diaphragm: muscle involved in breathing.
- ✎ The ribs: protect the lungs.
- ✎ The intercostal muscles: move the ribs in and out during breathing.

Functions of the respiratory system:

- Gas exchange:
Bring oxygen into the lungs and bloodstream.
Move carbon dioxide and some water out of the blood into the lungs and out of the body.
- Create sound: the vocal cords in the larynx (voice box) vibrate as air passes through them, creating sound.

A. Structure of the respiratory system

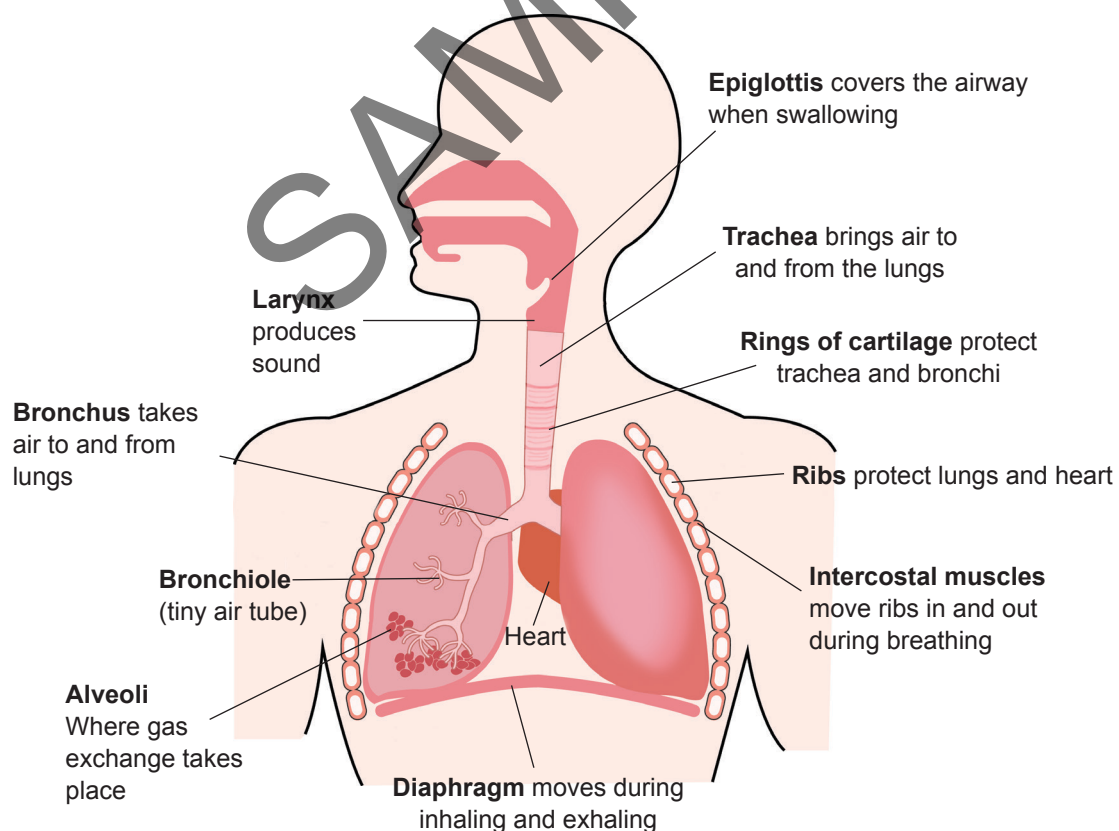


Fig. 1 The human respiratory system

Part	Structure	Function
Nasal cavity	Contains tiny hairs	Trap dust; warm and moisten the air
Pharynx	Contains a flap of tissue called the epiglottis	Prevents food entering the respiratory system
Larynx	Contains two vocal cords	Vibrate to produce sound
Trachea	Has C-shaped rings of cartilage for strength and support Contains tiny hairs called cilia	Airway that brings air to the lungs. Cilia trap dust
Bronchi	Two branches off the trachea	Airways
Bronchioles	Tiny branches off the bronchi	Airways
Alveoli	Tiny air sacs – approximately three million in each lung	Gas exchange
Ribs	12 pairs	Protect the lungs
Intercostal muscles	Muscle between the ribs	Move the ribs in and out
Diaphragm	Large muscle under the lungs	Involved in breathing

Gas exchange in the lungs

Gas is exchanged between the alveoli and the blood stream.

Oxygen moves into the blood and carbon dioxide and water vapour move out of the blood.

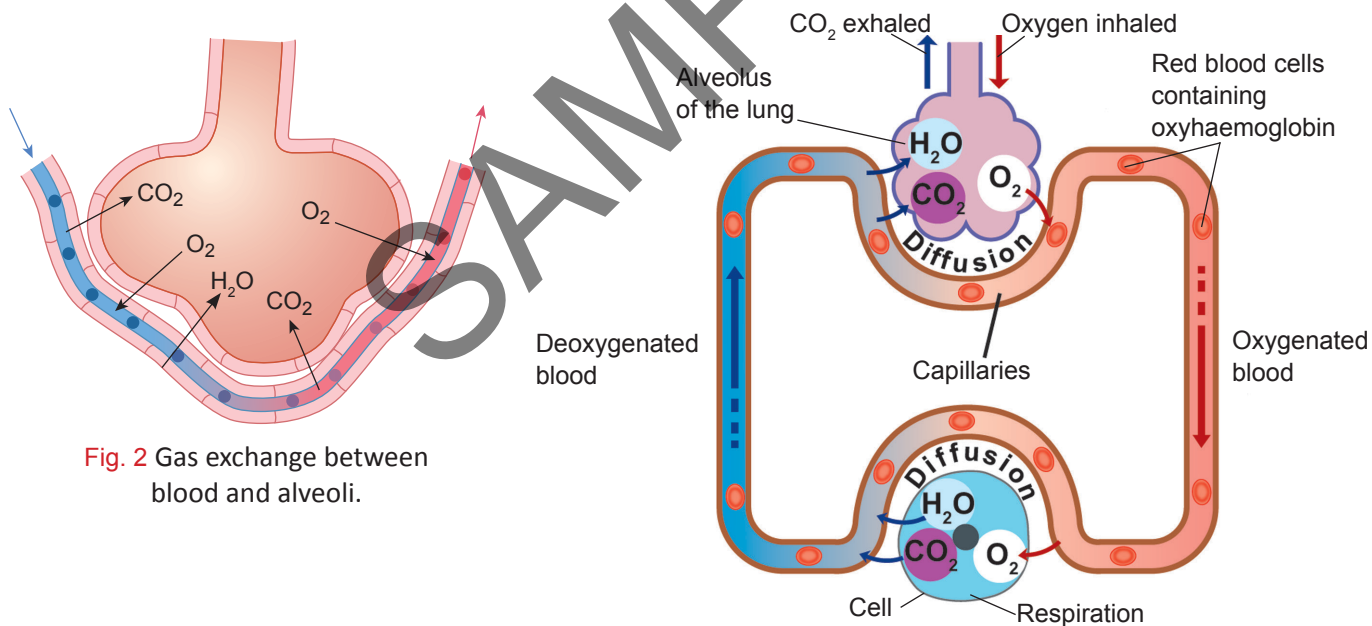


Fig. 2 Gas exchange between blood and alveoli.

Fig. 3 This diagram shows gas exchange and diffusion of gases from the blood and body cells.

Alveoli are adapted for gas exchange:

- Numerous: Millions of them provide a large surface area for gas exchange.
- One cell thick: allows quick transfer of gases
- Surrounded by capillaries: allows maximum transfer of gases with the blood.
- Moist: gases diffuse more quickly over moist surfaces.

Inhalation and exhalation

Inhalation is an active process.

1. The diaphragm and intercostal muscles contract causing the chest cavity to get bigger.
2. This pulls air in and the lungs inflate.

Exhalation is a passive process.

1. The diaphragm and intercostal muscles relax causing the chest cavity to get smaller.
2. This forces air out and the lungs deflate.

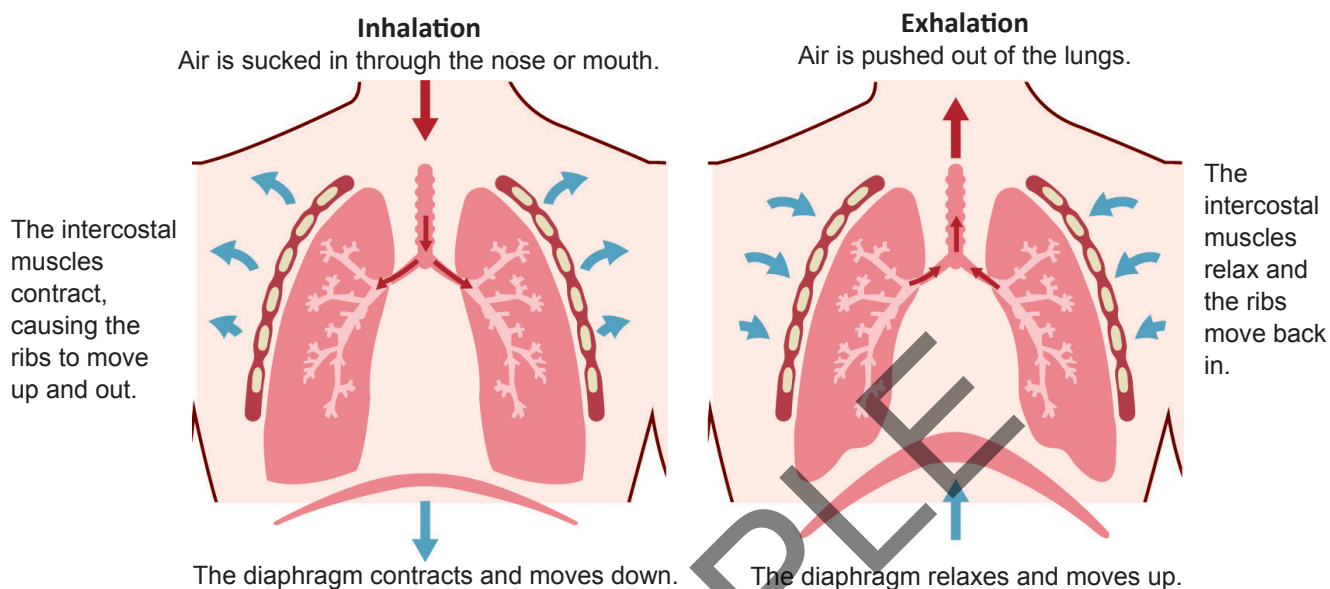


Fig. 4 Inhalation and exhalation

SEC Exam Paper 2019

Question 9

15 marks

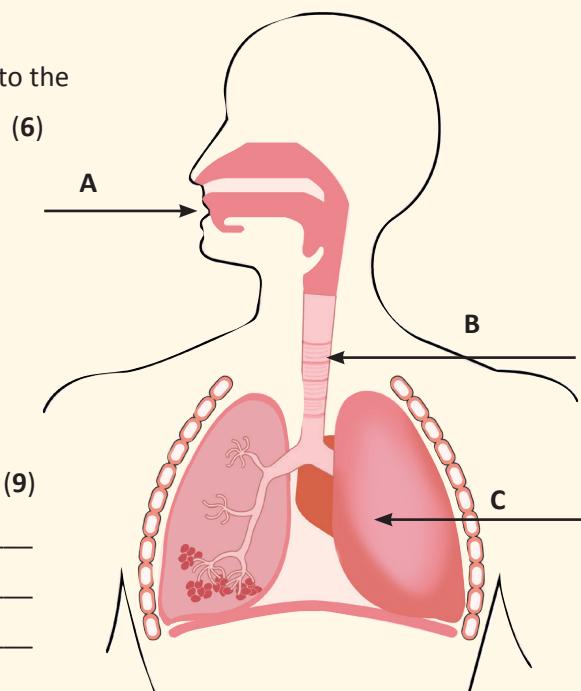
The diagram shows the human respiratory system.

- (a) Complete the table below by matching the words to the letters in the diagram.

Lung Trachea Liver Oesophagus Mouth

Letter	Part of respiratory system
A	
B	
C	

- (b) Describe what happens in the respiratory system when a person breathes in.



SEC Sample Exam Paper 2018**Question 4****15 marks**

The passage below explains how a cell gets the materials it needs for respiration.

The names of five parts of the body are missing from the passage.

Here are the missing body parts:

Heart Veins Small intestine Stomach Lungs

In the spaces provided, write the names of the missing body parts.

When we breathe we draw air into our _____ where the oxygen in the air is passed into our blood.

After we swallow food it is first stored in our _____ for a few hours, where some digestion occurs. Then it travels on to our _____ where further digestion happens and glucose and other nutrients are absorbed into our blood.

Blood is pumped around the body by our _____. The blood travels through arteries and capillaries to all the cells in our body. The blood then travels back through our _____.

