

Exercise 5 page 73-77

1 Study the sketch alongside and answer the questions that follow:

1.1 Provide the sketch with a heading.

The respiratory system

1.2 Provide the following labels:

B: Trachea

D: Lung pipe (bronchiole)

E: Diaphragm

1.3 What is the difference in structure between A and C?

A consists of two lobes, while C consists of three lobes

1.4 Which muscles play a role in the respiratory system?

The diaphragm and the intercostal muscles

1.5 What do we find at the ends of D?

Alveoli

1.6 What do we call the blood vessels that are found surrounding the part of your answer in Question 1.5?

Small capillaries

1.7 Say what prevents B from collapsing and give their shape.

C-shaped cartilage rings

1.8 Which valve prevents food from moving down B?

Epiglottis

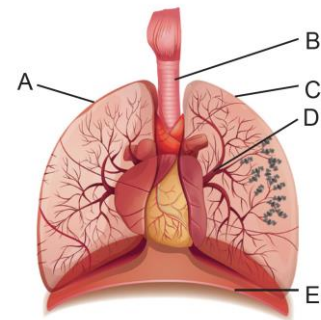
1.9 How are the lungs adapted to increase efficiency?

There is a mechanism for the movement of air inward and outward, viz. the respiratory muscles which enlarge and reduce the chest.

The lungs have a very large surface area for gaseous exchange. Small blood vessels are against the alveoli which make gaseous exchange easier. Alveoli facilitate easier gaseous exchange by being one cell layer thick.

1.10 Which system in the human body goes hand in hand with the respiratory system?

Circulatory system



2. Explain the process of gaseous exchange in point form.

1. Air is inhaled.

2. The alveoli are filled with oxygen (O₂). (Alveoli are surrounded by a large number of capillary blood vessels.)

3. Capillary blood vessels bring blood into close contact with the alveoli.

4. Deoxygenated blood contains carbon dioxide (CO₂) and flows to the alveoli.

5. Diffusion takes place.

6. Oxygen moves through the thin walls of the alveolus to the blood vessels.

7. Carbon dioxide moves through the thin walls of the blood vessels to the alveoli.

8. In the blood, oxygen binds to haemoglobin to form oxyhaemoglobin.

9. Oxygenated blood is transported to the heart b.m.o. circulation.

10. Oxygenated blood is pumped under high pressure from the heart to the body.

11. Carbon dioxide is exhaled.

3. Briefly describe the function(s) of the nose during breathing, and how it is adapted to fulfill its function(s).

The nose cleanses the air of dust and germs.

Mucous membranes in the nose keep the air moist.

Blood vessels in the nose keep the air warm.

4 You and your friends decide to use the apparatus as shown to represent the respiratory system:

4.1 What does the glass tube represent?

The trachea

4.2 What do the balloons represent?

The lungs

4.3 What does the plastic bag represent?

The diaphragm

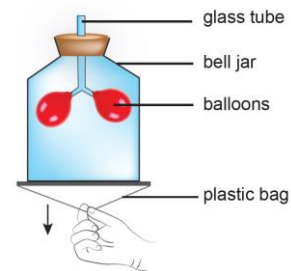
4.4 What will happen if:

4.4.1 you pull the plastic bag down;

The balloons will inflate.

4.4.2 you let the plastic bag go back up?

The balloons will deflate.



5 Study the sketch before you answer the following questions:

5.1 Which gas is represented respectively by A and B?

Gaseous exchange

5.2 Which gas is represented respectively by A and B?

A: Carbon dioxide (CO₂)

B: Oxygen (O₂)

5.3 What type of blood enters at the capillary?

Deoxygenated blood

5.4 What type of blood exits the capillary?

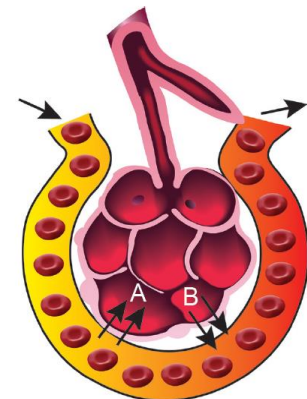
Oxygenated blood

5.5 To which substance does the oxygen bond in red blood cells?

Haemoglobin

5.6 Where in the human body does this process take place?

In the lungs (alveoli)



6 Aerobic respiration takes place in the human body.

6.1 What does "aerobic respiration" mean?

It is respiration that requires oxygen.

6.2 In which part of the cells does cellular respiration take place?

Mitochondria

6.3 Name two products that form during cellular respiration.

Energy and carbon dioxide

6.4 Which one of the two products is the by-product?

Carbon dioxide

6.5 Briefly explain what happens to the by-product after cellular respiration has taken place.

Carbon dioxide diffuses from the cells to the capillary blood vessels.

Deoxygenated blood is transported via the heart to the lungs b.m.o. circulation, from where it is exhaled.

7. Research the negative effect that cigarette smoke has on the respiratory system. Write a short paragraph on the research that you have done.

When you smoke, the cells in your lungs that produce mucus become bigger and more.

This leads to more and thicker mucus in your lungs.

Your lungs cannot get rid of the mucus.

The mucus stays in your airways, clogs them and causes you to cough.

The extra mucus is also prone to infection.

Smoking ages your lungs faster and their natural defence mechanism that protects you from infection, is hindered.

Smoking can damage and destroy lung tissue.

This leads to a decrease in air spaces and blood vessels in the lungs.

This results in less oxygen that can spread to the rest of the body.

Cilia are hair-like organelles that clean the air in your lungs.

When you smoke, cilia move slower and it also decreases the number of cilia in the lungs.

Therefore, there are less cilia to clean the organ.

Smoking also increases your chances of getting lung cancer, emphysema and chronic bronchitis.