



LIMPOPO

PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

LIFE SCIENCES PRACTICAL

06 AUGUST 2024

MARKS: 40

TIME: 1 hour

This question paper consists of 08 pages including cover page.

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INSTRUCTIONS AND INFORMATION

You will complete this **PRACTICAL** at **school** under the supervision of an **Invigilator**.

NB: Assessment will be marked out of **40 (60 minutes)**

Read the following instructions carefully before answering the questions

1. Answer ALL the questions.
2. Write ALL answers in the SPACES PROVIDED.
3. Present your answers according to the instructions of each question.
4. Do ALL drawings in pencil and label them in blue or black ink.
5. The diagrams in this, tables or flow charts only when asked to do so.
6. The diagrams in this question paper are NOT necessarily drawn to scale.
7. Do NOT use graph paper
8. You must use a non-programmable calculator, protractor and a compass, where necessary
9. Write neatly and legibly

NAME OF SCHOOL: _____

NAME: _____

DATE: _____

TOPIC ASSESSED: GASEOUS EXCHANGE**Time: 60 minutes****BACKGROUND INFORMATION****What is breathing?**

Breathing is the process that moves air in and out of the body (lungs). It enables oxygen to enter the body and carbon dioxide to be expelled.

Why is breathing so necessary for life?

The oxygen in the air is needed for the oxidation of food to release energy during respiration. This energy is used to perform the work needed to keep cells and organisms alive. Carbon dioxide is released during respiration and must be expelled; otherwise, it will lower the pH of body fluids.

What is gaseous exchange?

Gas exchange occurs in the lungs. When we breathe in, oxygen from the inhaled air diffuses into the blood through the alveoli. Meanwhile, carbon dioxide diffuses from the blood into the alveoli and is exhaled.

What is the breathing mechanism?

The breathing mechanism allows for pulmonary ventilation, commonly known as 'breathing'. This is the process of moving air into and out of the lungs. Air flows into the lungs during inspiration (inhalation) and out of the lungs during expiration (exhalation). Air flows because of pressure differences between the atmosphere and gases inside the lungs.

QUESTION 1

The effects of Altitude

1. An investigation to determine the average number of the red blood cells of people at different altitudes was conducted, and the results are shown in the table below. The scientist constantly used 10 healthy people who live permanently at each altitude.

Altitude (m)	Average no. of red blood cells (millions per mm ³)
0	4.8
1000	5,2
2000	5.9
3000	6,4
4000	7.5
5000	8

1.1. State:

- a) The independent variable of this investigation (1)

- b) The dependent variable of this investigation (1)

1.2. How could the scientist have increased the validity of this investigation

Give two ways (2)

1.3. State one way in which the scientist ensured that, this investigation is reliable (1)

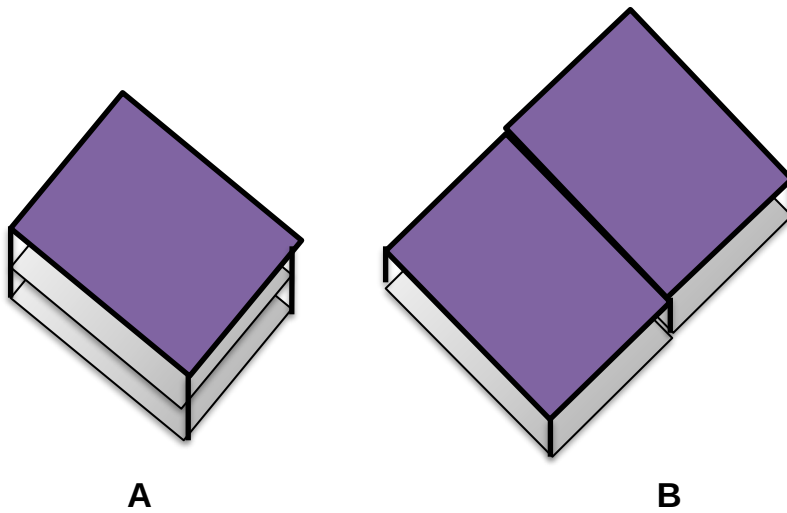
1.4. Suggest a possible reason why some athletes do not perform well at high altitudes as they do at sea level (2)

Draw a line graph below to represent in the table

(6)

QUESTION 2: Gas Exchange and Surface area

2. Consider the following organisms (A and B) with the different surface area of gas exchange. A surface area is one of the requirements of an efficient gas exchange system.



2.1 Which organism (A or B) will be more efficient as a gas exchange surface Area? (1)

2.2 Give a reason for your answer in 2.1 (2)

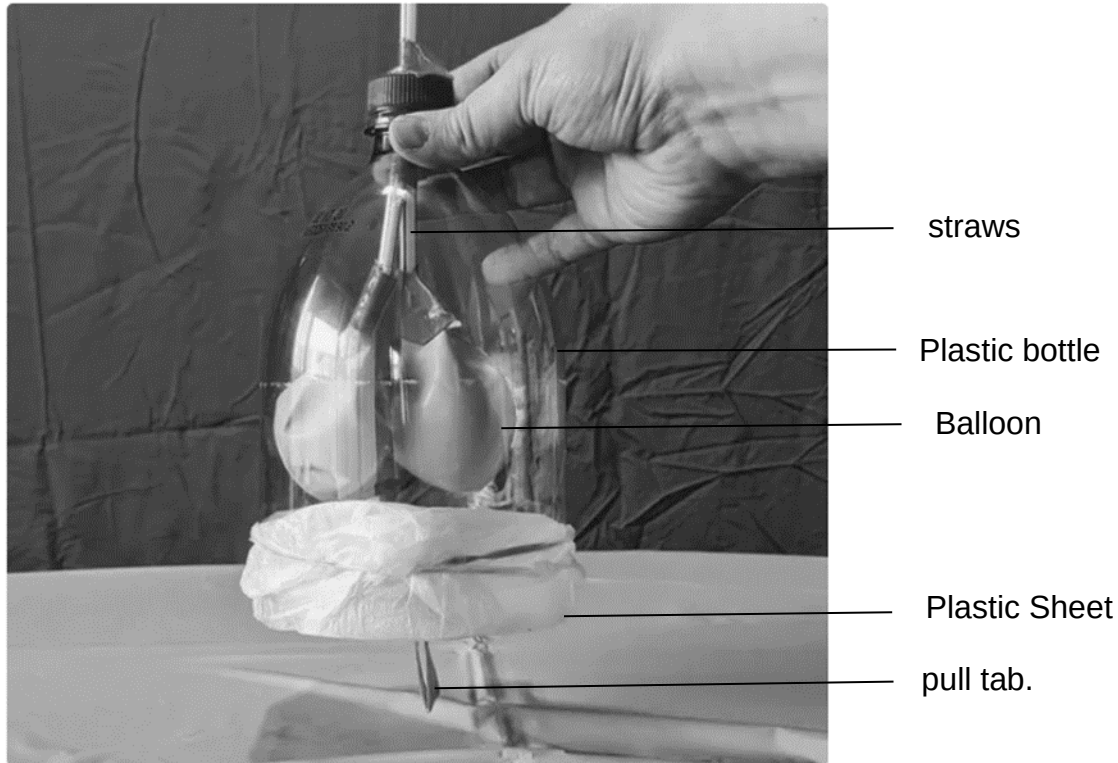
2.3 Why is a large surface important for efficient gaseous exchange (2)

2.4 Mention ONE other requirement of surface area and explain why it is important for gas exchange (3)

2.5 Which organism will not require a blood system for transport of gases? Explain your answer (3)

2.6 Provide the mechanism which is required to ensure that oxygen-laden air is brought in and carbon dioxide-laden air is driven out. (2)

(13)

QUESTION 3: Breathing mechanism**Hands on practical on breathing mechanism.****Procedure:**

Use the Model of the human lung that was build earlier and answer the following questions

3.1 For each item listed below, provide the appropriate name of the corresponding part in the human respiratory system.

- a) Plastic bottle _____ (1)
- b) straws _____ (1)
- c) Balloon _____ (1)
- d) Plastic Sheet _____ (1)

3.2.

- Pull down the pull tab, observe and record what happens to the plastic sheet and balloon.
- Release the pull tab, observe and record what happens to the plastic sheet and balloon.

3.2.1. Describe what happens to the balloon when the plastic sheet is pulled downwards (1)

3.2.2. Explain the process observed in 3.2.1. in the human body. (3)

3.2.3. Describe what happens to the balloon when the plastic sheet is released and moves to the original position (1)

3.2.4. Explain the process observed in 3.2.3. in the human body. (3)

3.3 Does pulling the pull tab at the bottom of the plastic sheet represent a passive- or active process in the human mechanism of breathing? (1)

3.4 What happens to the pressure in the plastic bottle when Plastic sheet is released back to original position? (1)

(14)

TOTAL MARKS: 40