Answers of Pack 1- (Unit 1)

Topic 1.1 The human respiratory system

Exercise 1.1 The human respiratory system

1

Letter	Name
A	diaphragm
B	intercostal muscle
C	rib
D	lung
E	air sacs
F	bronchus
G	bronchiole
H	trachea (windpipe)
J	larynx (voicebox)

2

Letter	Function
C	protects the lungs
D	where oxygen gets into the body
E	where oxygen goes into the blood and carbon dioxide comes out
F	delivers air to the lungs
G	carries air from the bronchus, deep into each lung
H	carries air from the bronchioles to each air sac
J	makes sounds

Topic 1.2 Gas exchange

Exercise 1.2 Gas exchange

1 The entries should be arranged in order of either decreasing or increasing body mass. For example:

Mammal	Body mass in g	Total surface area of air sacs in m^2
human	80 000	70
sheep	68 000	60
fox	20 000	40
rabbit	1000	2
rat	300	0.8
mouse	20	0.1

2 The larger the body mass, the larger the total surface area of the air sacs. Learners might also add that the relationship is not proportional.

3 The larger an animal is, the more oxygen it will need, because it will contain more cells that are all respiring and using up oxygen. Having a larger surface area of air sacs enables more oxygen to diffuse into the body at the same time, which helps to supply the demands of the respiring cells. A similar argument could be put forward relating to the need to get rid of carbon dioxide produced by the respiring cells.

Topic 1.3 Breathing

Exercise 1.3A Measuring lung volumes

1 Use the measuring cylinder to measure a known volume of water – say 50 cm^3. Pour the water into the bottle and mark its level as representing 50 cm^3. Repeat with another known volume – say another 50 cm^3 – and mark its level as 100 cm^3. Keep doing this until they reach the top.

2

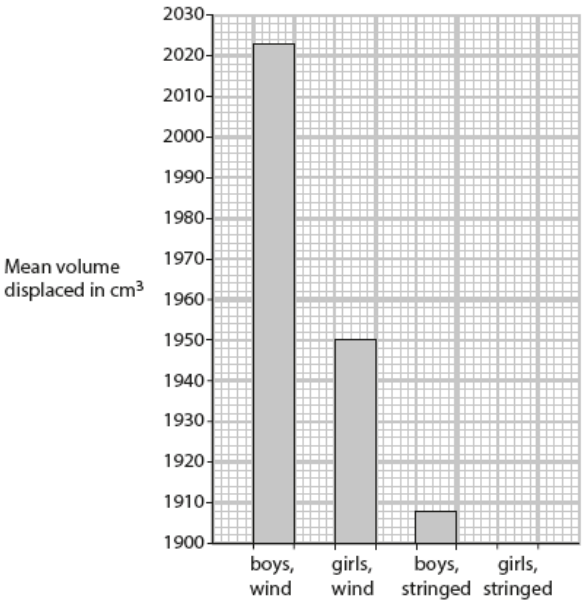
Person	Boy or girl	Wind or string player	Volume displaced in cm^3
1	boy	wind	2100
2	boy	wind	1965
3	boy	wind	2005
4	girl	wind	1950
5	boy	string	1865
6	boy	string	1950
7	girl	string	1905
8	girl	string	1910
9	girl	string	1885

3 $(2100 + 1965 + 2005) \div 3 = 2023\ cm^3$

4 $(1865 + 1950) \div 2 = 1908\ cm^3$

5 $(1905 + 1910 + 1885) \div 3 = 1900\ cm^3$

6



Topic 1.4 Respiration

Exercise 1.4 Respiration by yeast

1 A measuring cylinder, to measure out the yeast and sugar solutions.

2 Make sure that her eyes are level with the meniscus in the thermometer to read the temperature.

3 The temperature will increase, because respiration releases energy. Some of this energy is given off as heat.

4 She needs to have another cup where there is no respiration. For example, she could have a cup containing just yeast and water with no sugar, or a cup with just sugar solution and no yeast. She can then compare the temperature in the two cups.

Topic 1.5 Blood

Exercise 1.5A The components of blood

1 plasma

2 white blood cells

3 a red blood cells

b white blood cells

c plasma

Exercise 1.5B Functions of blood components

Blood contains a pale yellow liquid, called plasma. This liquid carries red blood cells and white blood cells around the body. It also transports several different substances in solution, including **nutrients** and **carbon dioxide**.

Red blood cells are the **most** abundant cells in the blood. Their function is to transport **oxygen** from the lungs to all the cells in the body that are respiring. To help them to do this, they contain a red pigment called **haemoglobin**.

White blood cells, **unlike** red blood cells, contain a nucleus. Their function is to destroy pathogens, such as **bacteria**, that get into the body. Some of them do this by producing chemicals called **antibodies**, which attach themselves to the pathogens and kill them. Other white blood cells kill pathogens by taking them into their **cytoplasm** and digesting them.