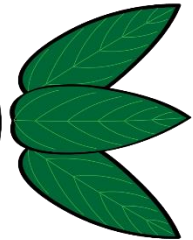
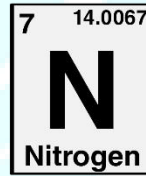
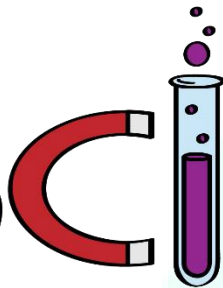
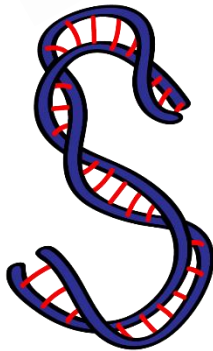




**ASPIRE**  
INTERNATIONAL SCHOOL



Science Department

2023/2024

Year 7

Term 3, Weeks 1-2

ASPIRE

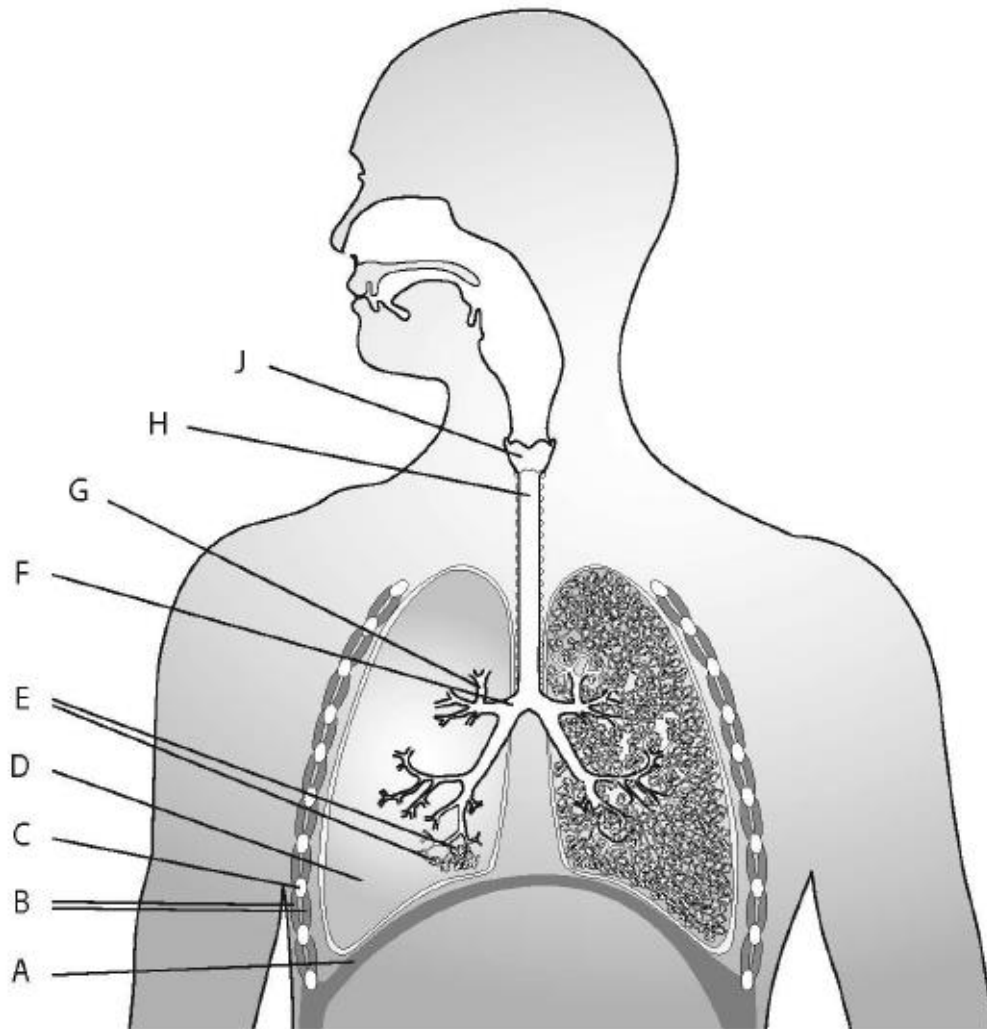
INTERNATIONAL SCHOOL

Name: .....

Class: .....

## Focus

The diagram shows the human respiratory system.



- 1 Complete the table by naming each of the parts shown on the diagram.

Choose from these names.

air sacs    bronchiole    bronchus    diaphragm    lung  
larynx (voice box)    intercostal muscles    rib    trachea

Letter	Name
A	
B	
C	
D	
E	
F	
G	
H	
I	

### Practice

- 2 Describe the function of each of the labelled parts listed in this table.

Letter	Function
C	
D	
E	
F	
G	
H	
I	

## > 1.2 Gas exchange

### Exercise 1.2 Lung surface area and body mass

This exercise provides you with data about six different mammals. You will practise looking for correlations in data, and suggesting explanations for the patterns that you find.

#### Focus

The table shows the body masses of six mammals. It also shows the total surface area of the air sacs in the mammals' lungs.

Mammal	Body mass in g	Total surface area of air sacs per m <sup>2</sup>
human	80000.1	70
mouse	20.2	0.1
rabbit	400.3	8
rat	300.4	0.8
sheep	68000.5	60
fox	20000.5	40

- 1 The entries in the table are not in a very helpful order.

Complete the table by reorganising the entries in a way that makes it easier to see any patterns in the data.

Mammal	Body mass in g	Total surface area of air sacs per m <sup>2</sup>

## Practice

- 2 Describe the relationship between body mass and total surface area of the air sacs.

.....

.....

.....

## Challenge

- 3 Suggest an explanation for the relationship you have described.

.....

.....

.....

.....

## > 1.3 Breathing

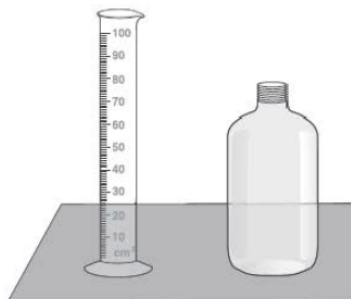
### Exercise 1.3A Measuring lung volumes

#### Focus

In this exercise, you complete a results table. Then you calculate mean values and draw a bar chart.

Sofia and Zara want to know if learners who play wind instruments in the school orchestra can push more air out of their lungs than learners who play stringed instruments.

The girls take a large, empty bottle. They mark a scale on the side to show volumes.



1 Describe how Sofia and Zara can make the scale on the bottle.

.....

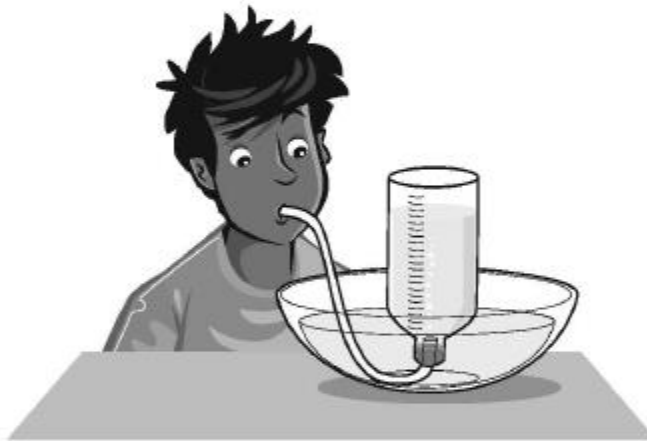
.....

.....

Sofia and Zara fill the bottle with water. They turn the full bottle upside down, with its open top in a large container of water.

Marcus plays a wind instrument. The girls ask Marcus to blow into the bottle as hard as he can. They use the scale to record how much water Marcus can push out of the bottle.

They then test eight more musicians.



Here are the results that Sofia and Zara collect.



100L

2 Complete Sofia and Zara's results table.

Person	Boy or girl	Wind or string player	Volume displaced in cm <sup>3</sup>
1	boy	wind	2100

3 Calculate the mean volume displaced (pushed out) for the boys who play wind instruments.

**Remember:** To calculate the mean of three values, add them up and divide by 3.

Show your working.

..... cm<sup>3</sup>

4 Calculate the mean volume displaced for the boys who play stringed instruments.

Show your working.

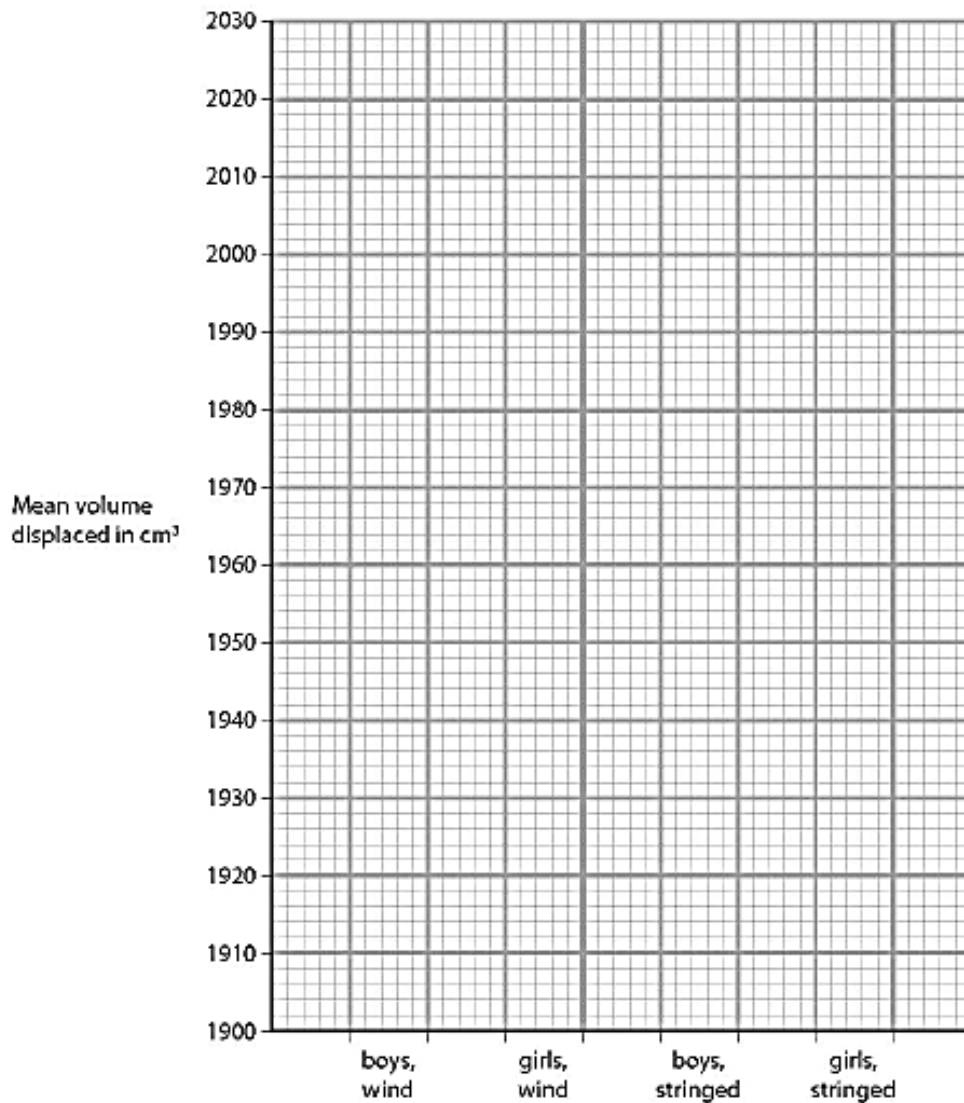
..... cm<sup>3</sup>

5 Calculate the mean volume displaced for the girls who play stringed instruments.

Show your working.

..... cm<sup>3</sup>

6 Complete the bar chart to show Sofia and Zara's results.





## > 1.4 Respiration

### Exercise 1.4 Respiration by yeast

In this exercise, you think about how to choose apparatus, and the correct way to use a thermometer. You make a prediction about temperature change and also think about using this apparatus to plan an experiment to test a hypothesis.

#### Focus

Yeast is a living micro-organism. Sofia wants to find out what happens to the temperature of yeast when it respire.

She has some yeast mixed with water. She measures  $25\text{ cm}^3$  of it and puts into an insulated cup.

Then she adds  $25\text{ cm}^3$  of sugar solution.



- 1 One piece of apparatus that Sofia needs is missing from the diagram. State what this apparatus is, and why Sofia needs it.

.....

.....

.....



CHOOOL

- 2 Sofia measures the temperature of the mixture of yeast and sugar solution in the cup.

How should Sofia measure the temperature?

Tick (✓) **all** the correct statements.

Hold the thermometer in the liquid and then take it out to read it carefully.

Stand the thermometer in the cup so it is resting on the bottom.

Hold the thermometer in the liquid and stir gently.

Make sure her eyes are level with the meniscus to read the temperature.

## Practice

- 3 Predict what will happen to the temperature of the mixture in the cup.

Explain your prediction.

Prediction .....

Explanation .....

.....

- 4 Sofia has missed out something very important from her experiment.

What has she missed out?

Look at what Sofia is trying to find out.

Think about what she needs to do to be sure any temperature change she measures is due only to the yeast respiring.

.....

.....

.....

## > 1.5 Blood

### Exercise 1.5A The components of blood

#### Focus

In this exercise, you will think about the three components that make up blood.

Human blood has three components:

- plasma
- red blood cells
- white blood cells.

1 Which of these three components is a liquid?

.....

2 Which of these three components have nuclei?

.....

3 Which component has each of these functions?

**a** transporting oxygen from the lungs to all the respiring cells in the body

.....

**b** protecting against pathogens that have got into the body

.....

**c** transporting blood cells, nutrients and carbon dioxide

.....

## Exercise 1.5B Functions of blood components

### Practice

In this exercise, you will think about suitable words to complete sentences about blood.

Choose the best words to complete the sentences.

antibodies    bacteria    carbon dioxide    cytoplasm  
glucose    haemoglobin    least    like    most nucleus  
oxygen    plasma    unlike

Blood contains a pale yellow liquid, called .....

This liquid carries red blood cells and white cells around the body.

It also transports several different substances in solution, including ..... and .....

Red blood cells are the ..... abundant cells in the blood.

Their function is to transport ..... 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. ....

White blood cells, ..... red blood cells, contain a nucleus.

Their function is to destroy pathogens, such as ....., that get into the body. Some of them do this by producing chemicals called ....., which attach themselves to the pathogens and kill them. Other white blood cells kill pathogens by taking them into their ..... and digesting them.