Cambridge Assessment International Education

Science

Stage 8

Paper 1 **2023**

Cambridge Lower Secondary Progression Test

Name

Class

Date

45 minutes

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Write your answer to each question in the space provided.
- You should show all your working on the question paper.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

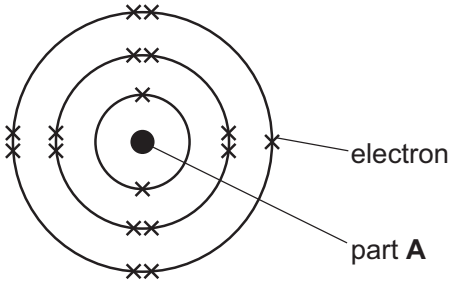
1 Draw a straight line to match each **blood component** to its correct **function**.

Draw three lines only.

blood component	function
red blood cell	carries carbon dioxide
white blood cell	fights pathogens
plasma	digests food
	transports oxygen

[2]

2 Look at the model of a diagram of an atom.



(a) Write down the name of part **A**.

..... [1]

(b) Which **two** particles make up part **A**?

..... and .....

[1]

(c) Which scientist developed the nuclear or planetary model of the atom?

..... [1]

(d) Write down the charge on an electron.

..... [1]

(e) The electrons in an atom are held in position.

They do **not** escape from the atom.

Explain how electrons are held in position.

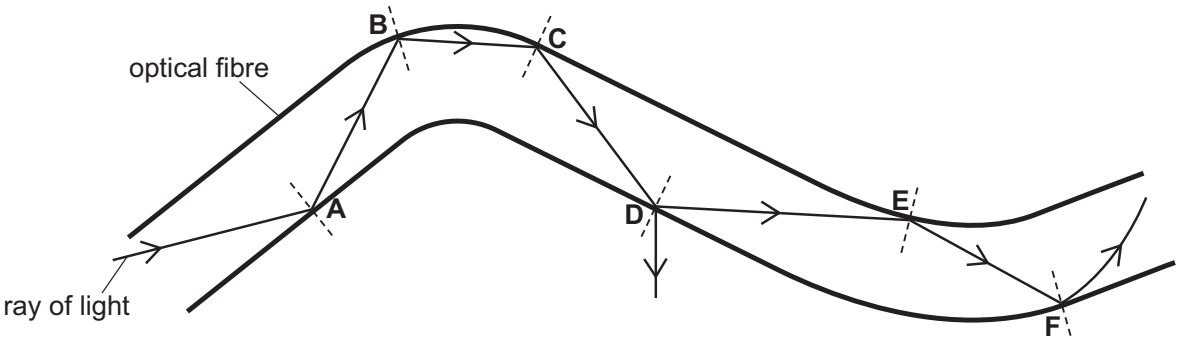
Use ideas about the charges on the particles.

.....

.....

..... [2]

3 Mia draws the path of a ray of light through an optical fibre.



A ray of light travels through an optical fibre without any of the ray escaping outside of the fibre.

Mia makes **three** mistakes in her drawing.

Complete the sentences to describe her mistakes at **B**, **D** and **F**.

The mistake at **B** .....

.....

The mistake at **D** .....

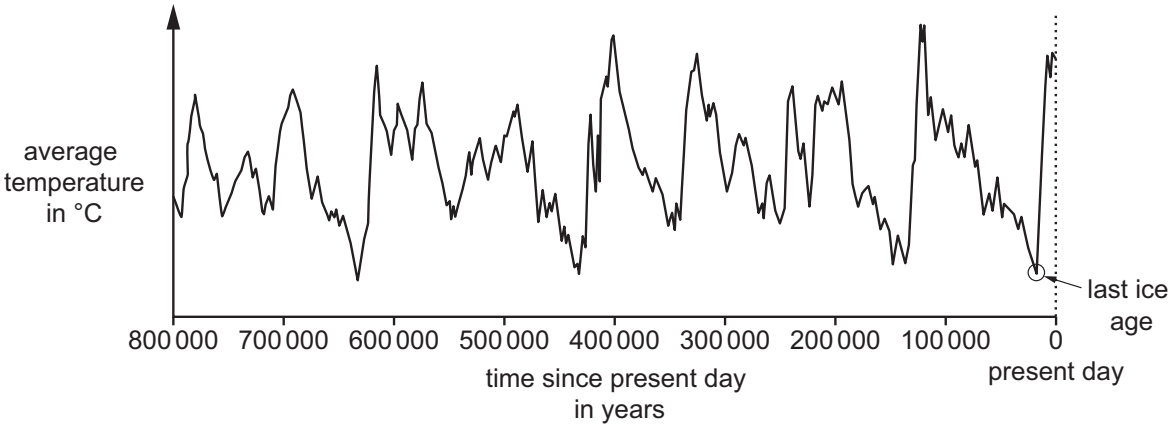
.....

The mistake at **F** .....

.....

[3]

4 Look at the graph showing how the average temperature of the surface of the Earth has changed over the last 800 000 years.



(a) The last ice age is circled on the graph.

Circle a point on the graph when **one other** ice age happened.

[1]

(b) Describe the pattern shown in the average temperature of the surface of the Earth over the past 800 000 years.

.....

.....

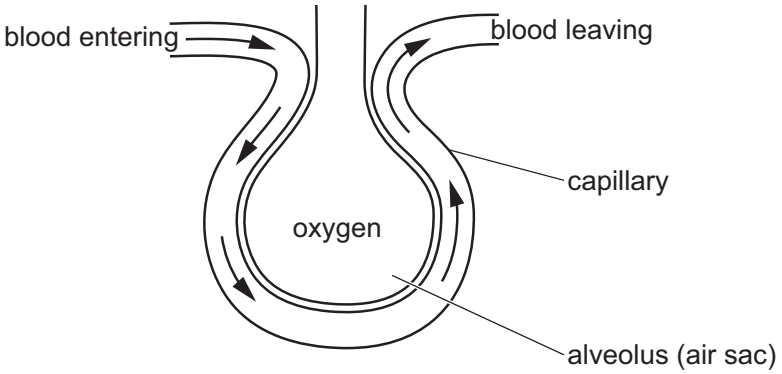
..... [1]

(c) Changes in the percentage of some gases in the atmosphere cause climate change.

Name **one** gas that causes climate change.

..... [1]

5 **(a)** Look at the diagram showing a blood capillary carrying blood to and from an alveolus (air sac) in the lungs.



(i) Oxygen in the alveolus (air sac) enters the blood.

Write down the name of this process.

..... [1]

(ii) Blood contains dissolved carbon dioxide.

Describe what happens to the carbon dioxide in the blood capillary.

.....

..... [1]

(b) The table shows the percentage of gases in air as it is breathed in and breathed out.

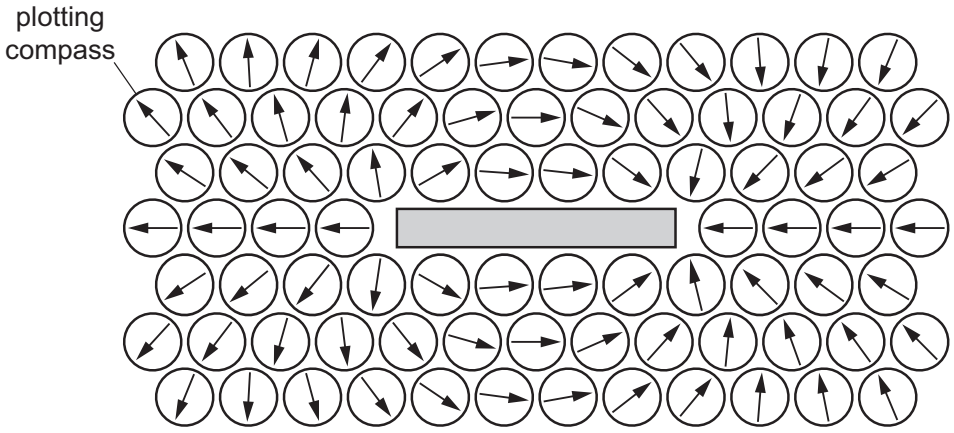
gas	breathed in %	breathed out %
carbon dioxide	0.04	.....
other gases	78.96	78.96
oxygen	21.00	.....

Predict the percentages of carbon dioxide and oxygen in **breathed out** air.

Write your answers in the table.

[2]

6 Carlos puts plotting compasses around a magnet.



(a) Look at the plotting compasses.

Describe what the plotting compasses show.

.....

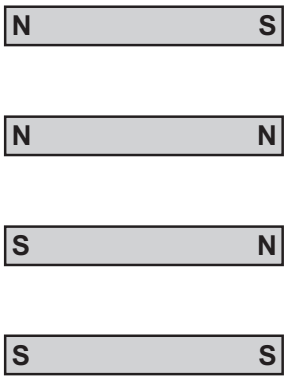
.....

..... [2]

(b) The magnet is in the middle of the plotting compasses.

Which diagram shows the position of the poles of the magnet?

Circle the correct answer.

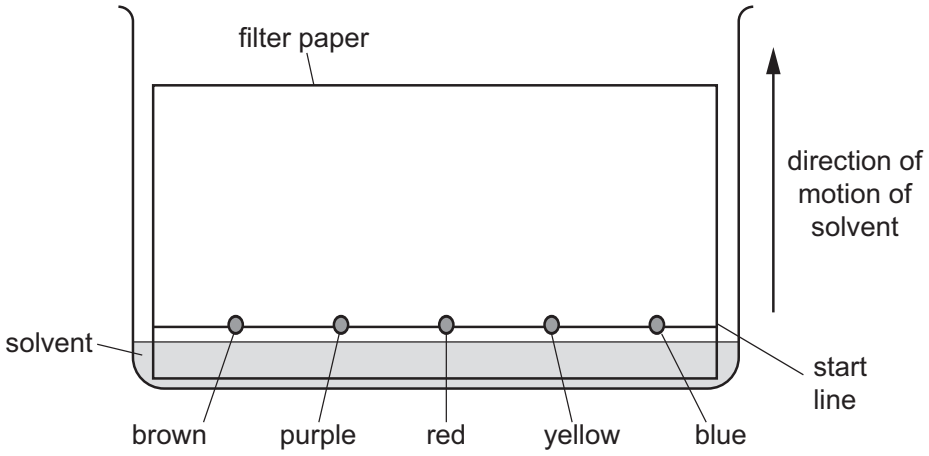


[1]

7 Oliver separates some food colourings.

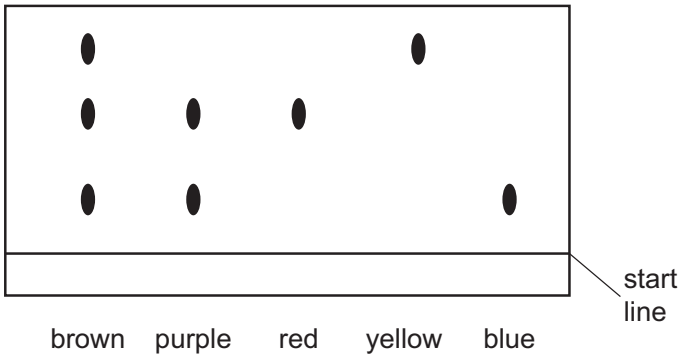
Oliver:

- draws a start line in pencil on some filter paper
- places dots of different food colourings on the start line
- puts the filter paper in the solvent as shown in the diagram



- waits until the solvent has soaked up the filter paper.

Look at his results.



(a) Write down the name of this separation technique.

..... [1]

(b) Which food colourings are **not** pure substances?

.....

Explain your answer.

.....

.....

[2]

(c) Write down the colours in the purple food colouring.

Choose from the list.

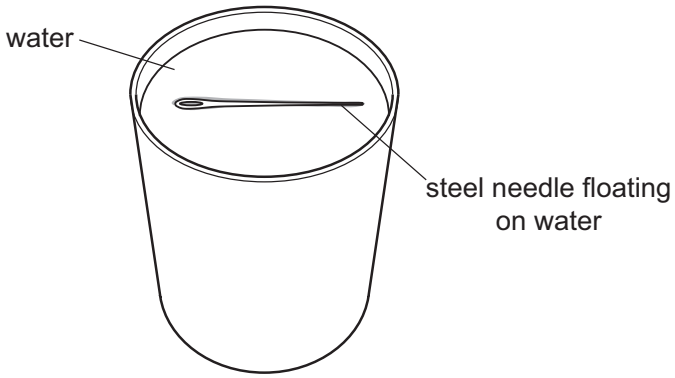
brown **red** **yellow** **blue**

..... [1]

8 Angelique investigates a steel needle floating on water.

In her first experiment Angelique:

- passes a steel needle over a strong magnet
- floats the steel needle on the surface of the water.



She repeats the experiment five times.

Each time, she floats the steel needle in different directions on the surface of the water.

The needle turns to point in the same direction every time.

Explain why.

.....

.....

.....

..... [2]

9 Pure substances contain either one element **or** one compound.

Impure substances are mixtures.

(a) Draw diagrams to show a model of the molecules in pure water **and** in impure water.

A molecule of water is represented by ○

A molecule of sugar is represented by ●

pure water

impure water

[2]

(b) Which word describes using a model?

Circle the correct answer.

analogy **conclusion** **precision** **symbol**

[1]

10 Safia plays a game of tennis.

(a) Look at the table showing the percentages of three nutrients in four foods.

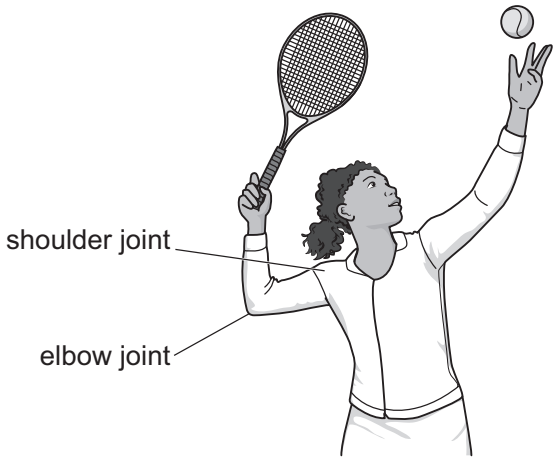
food	protein %	carbohydrate %	fat %
banana	4	88	2
boiled egg	13	1	11
cola drink	0	10	0
chicken sandwich	19	24	6

To give her energy, Safia eats 100 g of one of the foods before she plays her game of tennis.

Which food in the table contains the most energy?

..... [1]

(b) When Safia hits the ball, her shoulder joint and her elbow joint move.



(i) Write down the name of the type of joint at the shoulder.

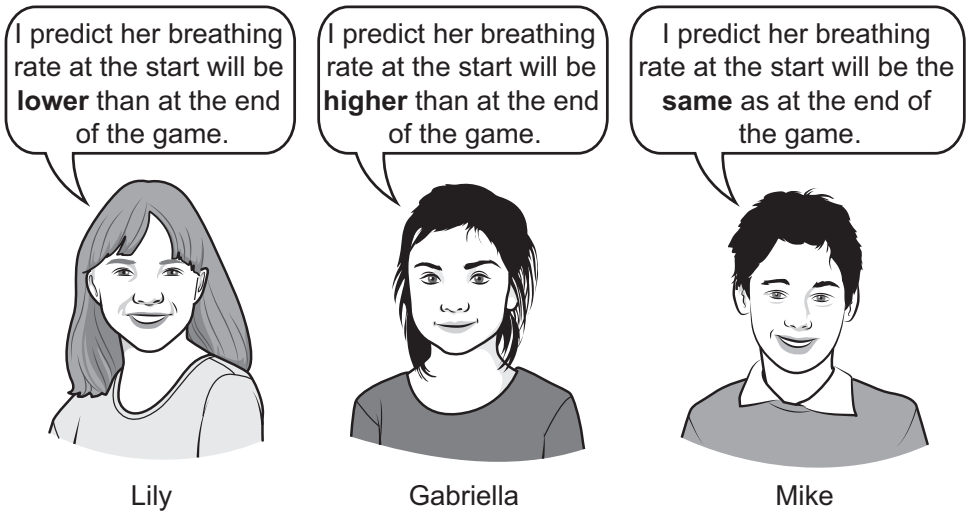
..... [1]

(ii) Explain how antagonistic muscles allow movement around the elbow joint.

.....

..... [1]

(c) Three of Safia's friends make predictions about her breathing rate.



Circle which friend has the correct prediction.

Lily **Gabriella** **Mike**

Explain your answer.

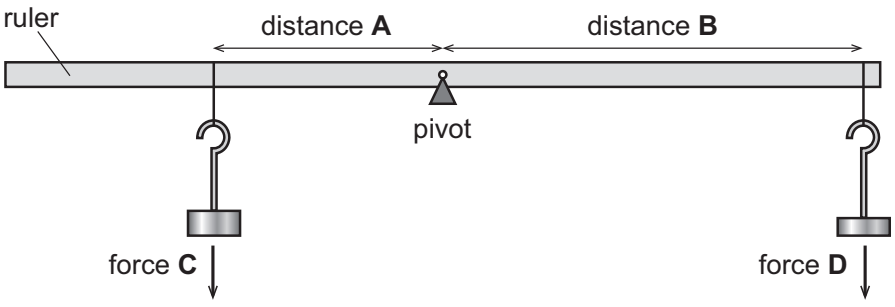
.....

.....

[2]

11 Chen investigates turning forces.

He balances a ruler using different forces and distances.



(a) The turning force is called a moment.

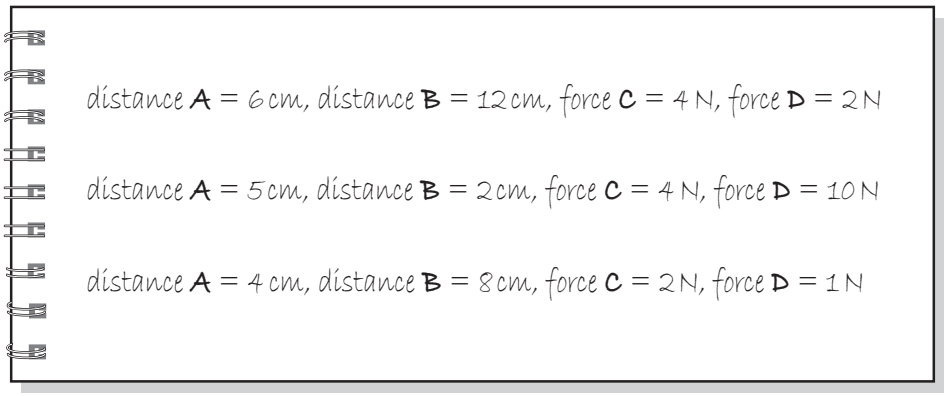
Describe how to calculate a moment.

.....

..... [1]

(b) Chen makes the ruler balance three times.

He writes down the different measurements each time.



(i) Complete the table using these results.

distance A in cm	**force C in N**	**distance B in cm**	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

[3]

(ii) Chen says,

'I think my results are reliable.'

Tick (✓) to show if Chen is correct.

Yes ☐ No ☐

Explain your answer.

.....

.....

[1]

12 This question is about energy resources.

(a) Look at the list of resources.

bioplastics

fossil fuels

tidal power

vegetable oil

solar power

Complete the table to group the resources into renewable **and** non-renewable resources.

renewable	non-renewable

[2]

(b) Wind power and coal are resources used to generate electricity.

Describe **two** advantages of using wind power instead of coal to generate electricity.

1 .....

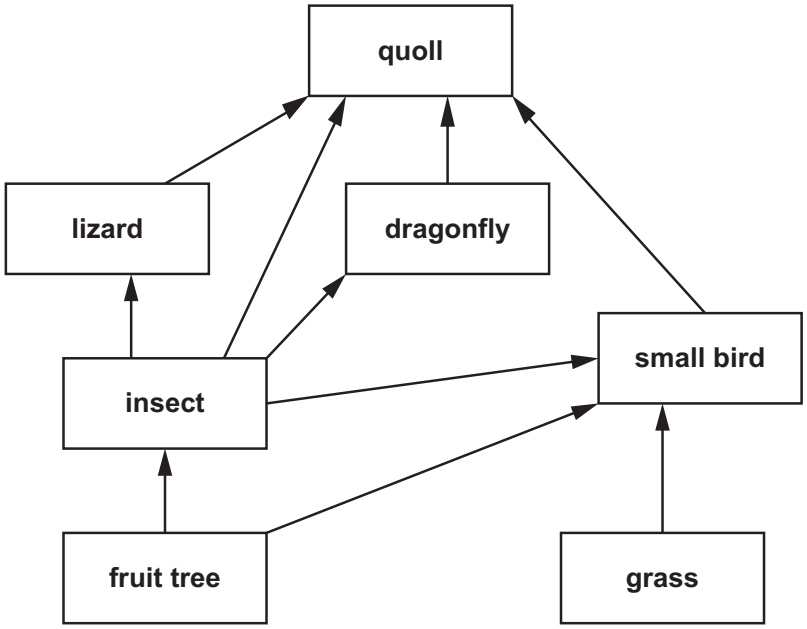
.....

2 .....

.....

[2]

13 Look at the food web for an Australian grassland ecosystem.



(a) Cats are an invasive species in Australia.

Cats eat small birds and lizards.

Explain the effect the introduction of cats has on the dragonfly population in this food web.

.....

.....

.....

..... [2]

(b) Insects eat fruit.

Farmers use a toxic substance to kill insects that eat the fruit on their fruit trees.

Quolls are also killed by this toxic substance.

Explain why.

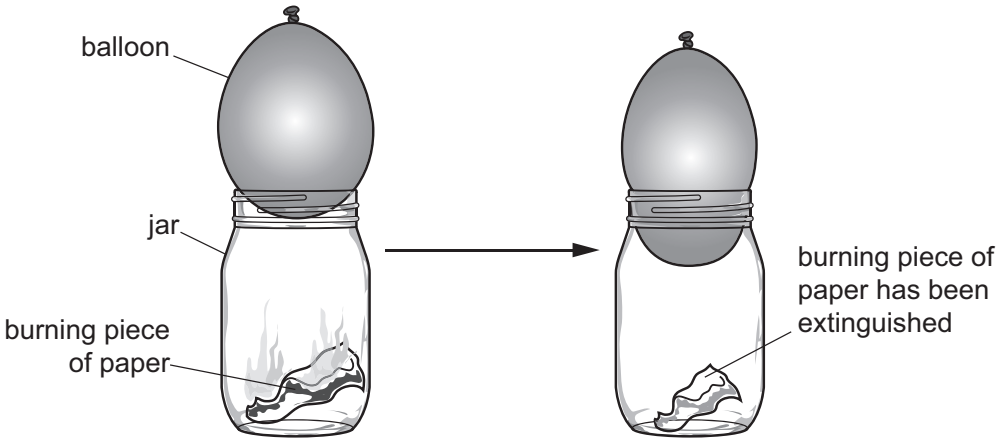
.....

..... [1]

14 A teacher investigates pressure.

The teacher:

- fills a balloon with water
- places a burning piece of paper in a jar
- puts the balloon on top of the jar.



(a) Describe how the teacher makes this investigation safe.

.....

..... [1]

(b) When the piece of paper stops burning, the temperature in the jar decreases.

The air pressure in the jar decreases.

Use the particle theory to explain why.

.....

.....

..... [2]