Cambridge Assessment International Education

Cambridge Lower Secondary Sample Test

For use with curriculum published in September 2020

Science Paper 2

Stage 8

45 minutes

Name .....

No additional materials are needed.

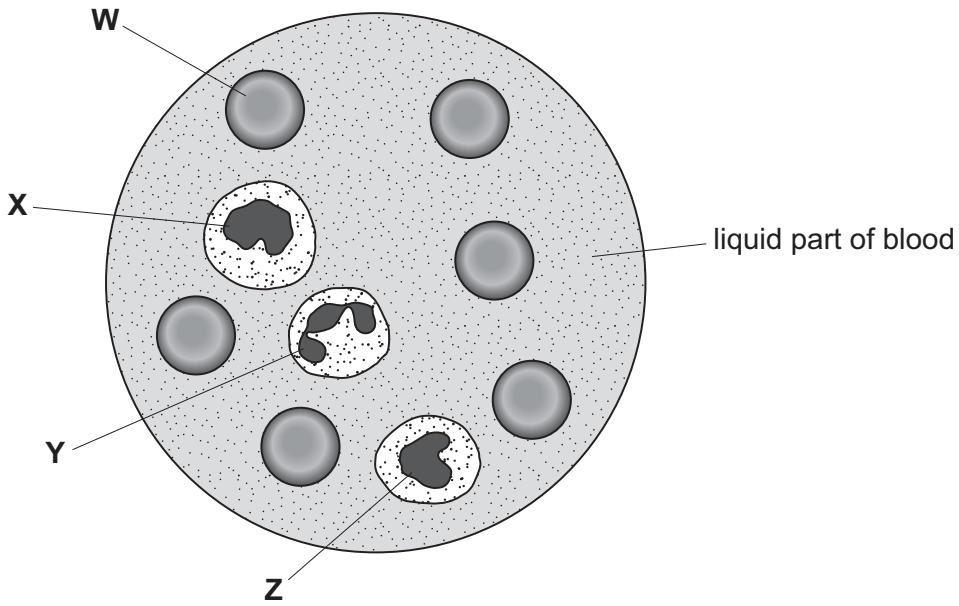
INSTRUCTIONS

- 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 The diagram shows a drop of blood as seen with a microscope.



(a) One type of blood cell carries oxygen.

(i) Name this type of blood cell.

..... [1]

(ii) Circle the letter that shows this type of blood cell.

W **X** **Y** **Z**

[1]

(b) When a person has an infection the number of white blood cells increases rapidly.

Explain why this happens.

.....

..... [1]

(c) **(i)** What is the name of the liquid part of blood?

..... [1]

(ii) Write down one substance that is transported by the liquid part of blood.

..... [1]

(d) (i) Measure the diameter, in mm, of the cell labelled **W**.

diameter = ... mm [1]

(ii) Use your answer in **(d)(i)** to calculate the actual diameter of cell **W**.

A 1 mm length on the diagram represents an actual length of 0.5 microns.

actual diameter = ... microns [1]

2 Atoms contain of protons, neutrons and electrons.

(a) Complete the table to show the electrical charges on each particle.

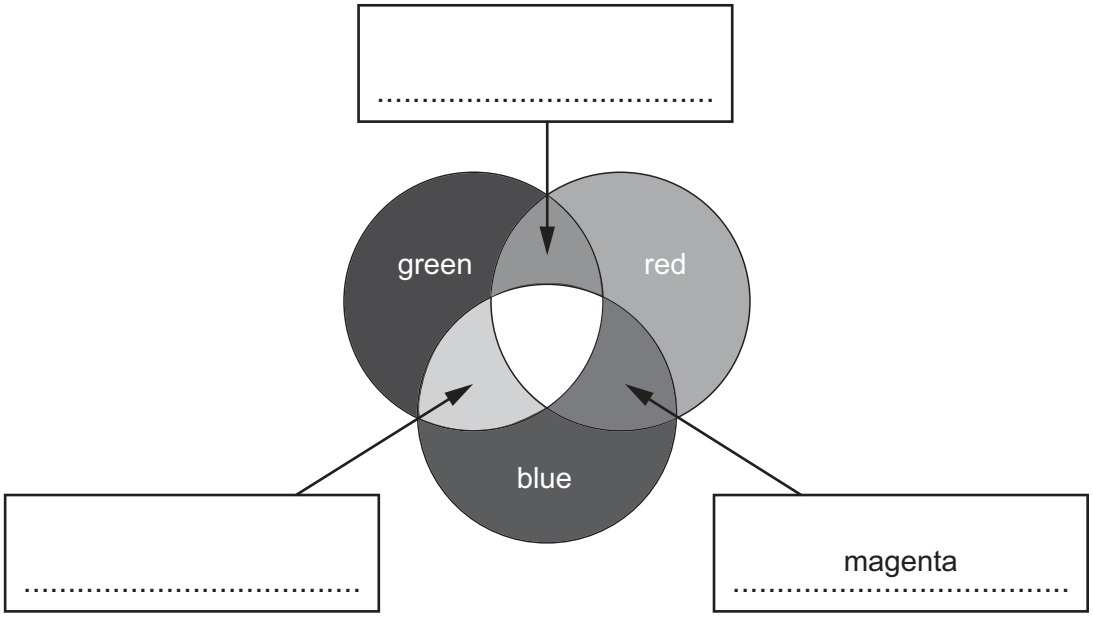
particle	electrical charge
proton	
neutron	
electron	

[2]

(b) What is the name of the part of the atom that contains the protons and neutrons?

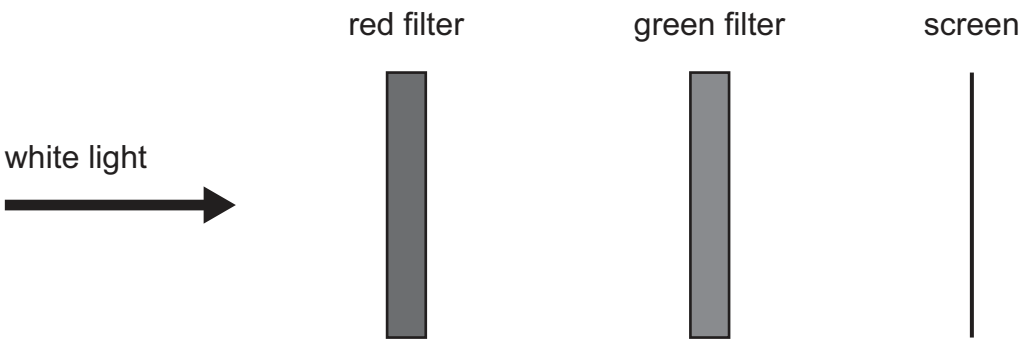
..... [1]

3 Look at the diagram. It shows the addition of different colours of light.



(a) Complete the diagram by writing the correct colour in each box. [2]

(b) Lily investigates two filters. Look at the diagram.



What does Lily see on the screen?

Circle the correct answer.

blue light **no light** **white light** **yellow light**

[1]

4 European rabbits were introduced into Australia as a source of food for humans in the late 1700s.

The number of rabbits increased rapidly.

They became pests and damaged the ecosystems in large parts of Australia.

(a) (i) What is an ecosystem?

.....

..... [1]

(ii) Suggest **two** reasons why the number of rabbits increased so rapidly.

1 .....

2 .....

[2]

(iii) Rabbits are herbivores.

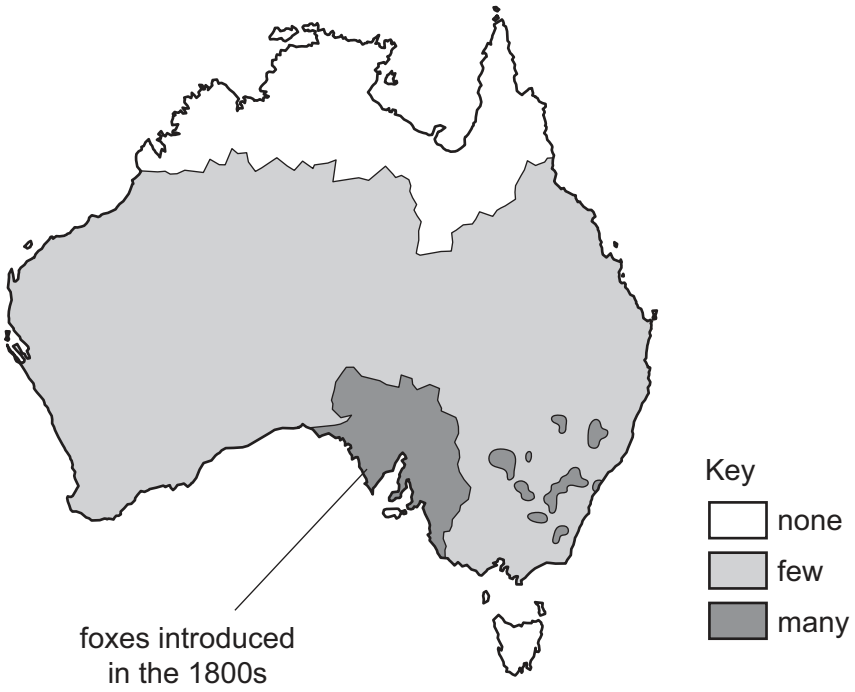
Suggest how a large number of rabbits damage an ecosystem.

..... [1]

(b) Foxes are predators and eat rabbits.

Foxes were released in Southern Australia in the 1800s.

Look at the map. It shows the distribution of foxes in Australia in 2006.



(i) Suggest how the data needed to make this map was collected.

.....

..... [1]

(ii) In many parts of Australia, foxes are an invasive species.

What is meant by an invasive species?

.....

..... [1]

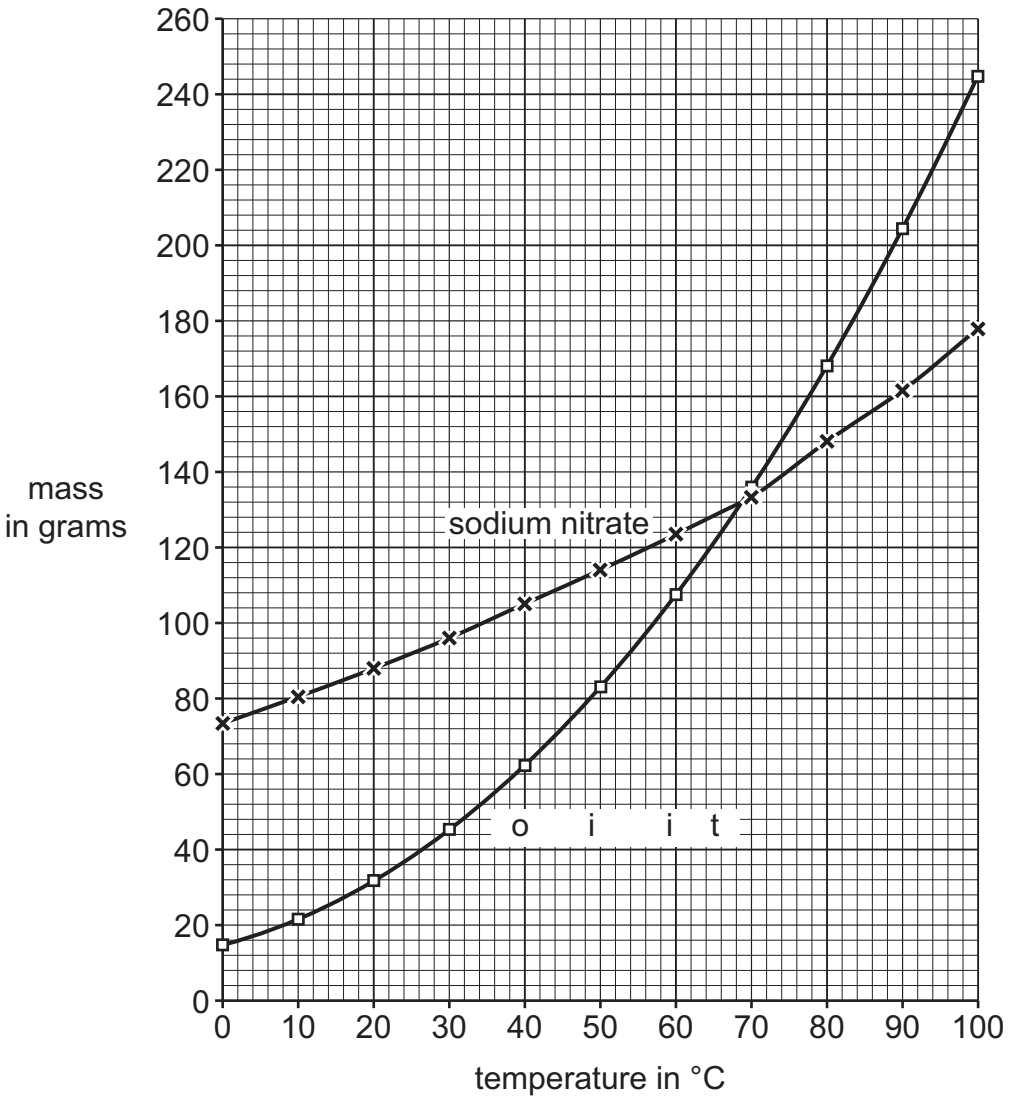
(iii) Describe how the evidence in the map supports the idea that foxes are an invasive species.

.....

..... [1]

5 Look at the graph.

It shows the mass of sodium nitrate and potassium nitrate that dissolves in 100 cm^3 of water at different temperatures.



(a) Describe how the mass of potassium nitrate that dissolves in 100 cm^3 of water changes as the temperature increases.

.....

..... [1]

(b) What mass of sodium nitrate dissolves in 100 cm^3 of water at 40 °C?

mass ..... g [1]

(c) At what temperature is the mass of sodium nitrate and the mass of potassium nitrate that dissolves in 100 cm^3 of water the same?

..... °C [1]

6 This question is about magnetic field lines.

(a) The north pole of one bar magnet attracts the south pole of another bar magnet.

Look at the diagram. It shows two bar magnets.

Draw **two** magnetic field lines between the magnets.

Include the arrows.

[2]

(b) The north pole of one bar magnet repels the north pole of another bar magnet.

Look at the diagram. It shows two bar magnets.

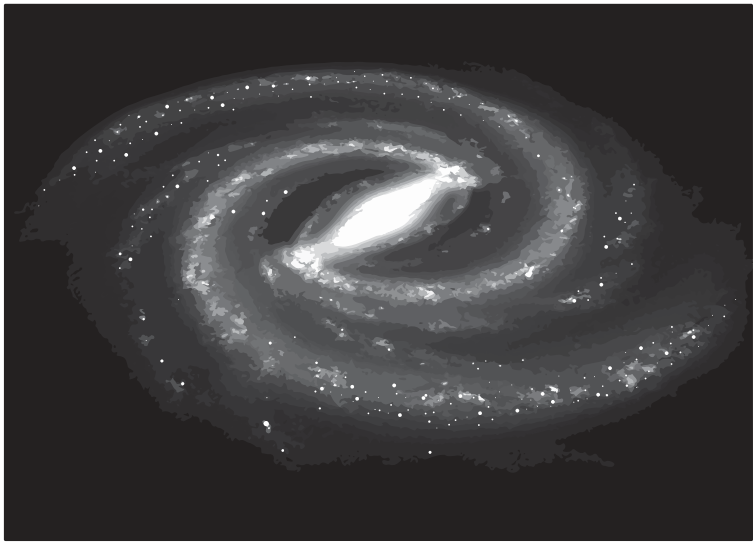
Draw **two** magnetic field lines between the two magnets.

Include the arrows.

[1]

7 The Milky Way contains a large number of stars and other matter.

The diagram shows what the Milky Way looks like from outer space.



(a) What name is given to a large number of stars such as the Milky Way?

..... [1]

(b) The Milky Way contains stars and planets.

Name one **other** type of matter found in the Milky Way.

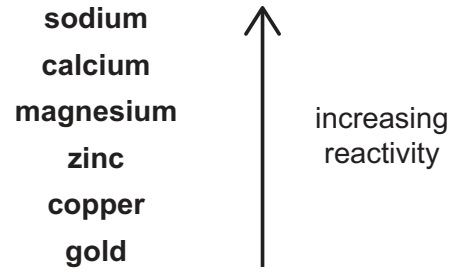
..... [1]

(c) The Sun is a star in the Milky Way.

What name is given to the Sun and its orbiting planets?

..... [1]

8 The chart shows part of the reactivity series of metals.



Many metals react with oxygen and water.

(a) Magnesium reacts with oxygen to make magnesium oxide.

Write the word equation for this reaction.

..... [1]

(b) Gold is unreactive and does **not** react with oxygen.

Explain why.

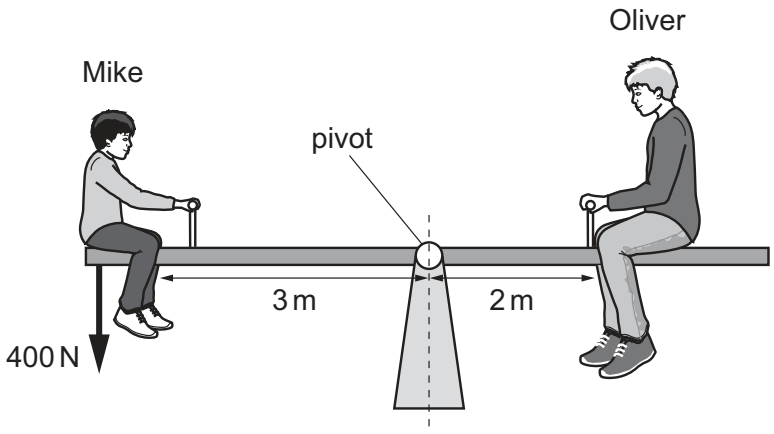
..... [1]

(c) Calcium reacts with cold water.

Write down the names of the **two** substances made in this reaction.

..... and ..... [2]

9 Mike and Oliver are on a see-saw.



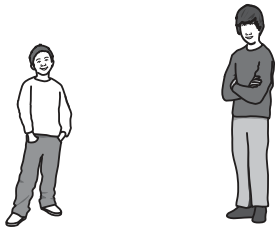
The see-saw is balanced.

(a) Mike has a weight of 400 N.

Calculate Oliver's weight. Use the principle of moments.

Oliver's weight = ... N [2]

(b) Pierre and Rajiv stand upright.



Pierre Rajiv

Look at the table. It shows some information about Pierre and Rajiv.

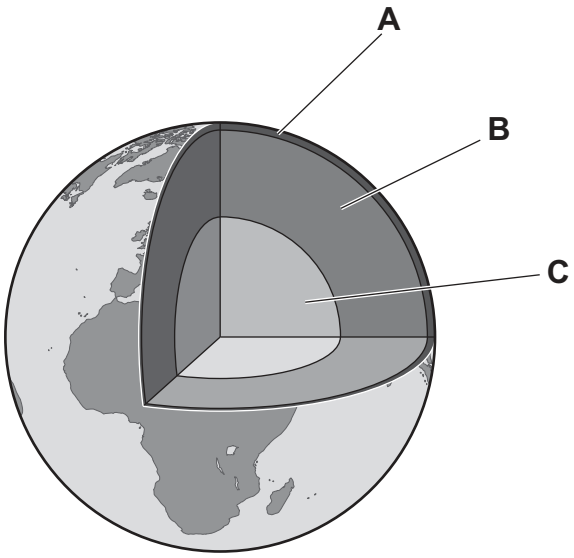
name	weight in N	area of shoes in m^2
Pierre	440	0.04
Rajiv	500	0.05

Pierre exerts a greater pressure on the ground than Rajiv.

Use calculations to explain why Pierre exerts a greater pressure on the ground than Rajiv.

[3]

10 The diagram shows the internal structure of the Earth.



(a) Which layer **A**, **B** or **C** is responsible for making the Earth's magnetic field?

..... [1]

(b) Write down the part of the Earth that acts as a magnet.

..... [1]

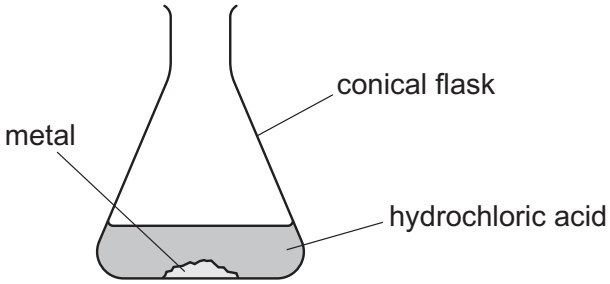
(c) Circle the equipment that finds the direction of the Earth's magnetic field.

compass **electromagnet** **forcemeter** **voltmeter**

[1]

11 Blessy reacts each of the metals calcium, magnesium and iron with dilute hydrochloric acid.

She wants to find out which reaction releases the most heat.



(a) Blessy decides to use 20 cm^3 of dilute hydrochloric acid and 0.1 g of each metal.

Explain why she uses the same volume of dilute hydrochloric acid each time.

.....

.....

[1]

(b) What measurements does Blessy take to find out which reaction releases the most heat?

.....

.....

.....

[2]

12 Priya makes an electromagnet.

She chooses from this list of equipment.

ammeter	**buzzer**	**electric cell**	**electrical wires**
iron rod	**lamp**	**switch**	**voltmeter**

Draw a circuit diagram for the electromagnet she makes.

[3]

13 People are concerned that increased global warming is causing climate change.

Evidence for increased global warming includes:

- the increase in the rate of melting of glaciers and polar ice caps
- a rise in mean sea levels.

(a) Explain why it is important to keep records of data over a period of time.

.....

.....

.....

[1]

(b) Satellites have sensors that can accurately measure the height of the sea.

They can also take detailed photographs of the surface of the Earth.

(i) Suggest **one** reason why it is important to make a large number of observations of the Earth.

.....

.....

.....

[1]

(ii) Give **one** reason why it is important to make accurate and detailed observations over time.

.....

.....

.....

[1]