Cambridge Lower Secondary Checkpoint

CANDIDATE NAME

SCIENCE **1113/02**

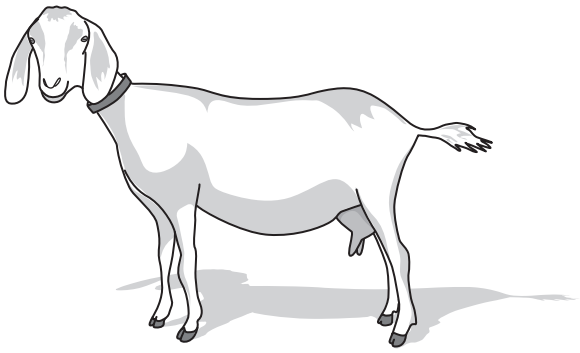
Paper 2 **April 2020**

45 minutes

Candidates answer on the Question Paper.

Additional Materials: Pen, Pencil, Ruler, Calculator

1 A farmer breeds goats for their milk.



(a) The farmer uses selective breeding.

These are the steps he uses.

They are in the wrong order.

A He breeds the female goat with a male goat.

B He repeats the steps for several generations.

C He chooses a female goat that produces a lot of milk.

D He breeds the female offspring with a male goat.

E He chooses a female offspring that also produces a lot of milk.

Put the steps in the correct order.

One has been done for you.

		E		

[2]

(b) The characteristic the farmer chooses in his female goats is producing lots of milk.

Suggest **one other** characteristic the farmer wants in his goats.

..... [1]

(c) Natural selection is the way new varieties of animals form in the wild.

Which scientist developed the idea of natural selection?

Circle the correct answer.

Copernicus

Darwin

Galileo

Pasteur

Rutherford

[1]

2 Aiko wants to increase the rate of reaction between sodium carbonate and dilute nitric acid.

(a) Match the **way** that she can do this to **why it works**.

Draw only **two** straight lines.

way	why it works
increase the temperature of nitric acid	more crowded particles so more collisions
	particles have less energy so more collisions
increase the concentration of nitric acid	particles move faster so more collisions
	has bigger particles so that there are more collisions

[2]

(b) Lumps of sodium carbonate react more slowly with dilute nitric acid than powdered sodium carbonate.

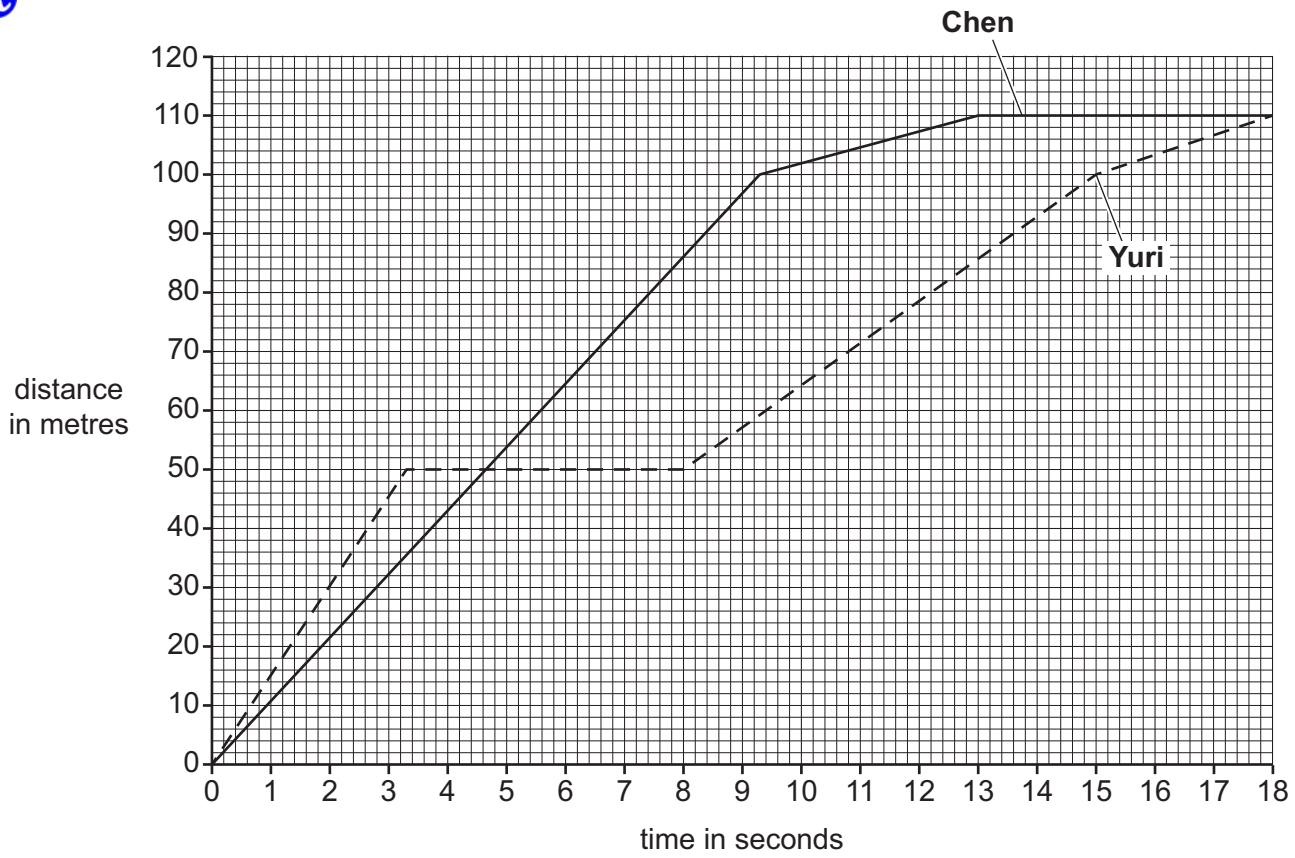
Use ideas about collisions to explain why.

.....

.....

..... [2]

3 Chen and Yuri draw a distance / time graph for their journeys.



Use the distance / time graph to answer the questions.

(a) How many metres did **Chen** move in the first 8 seconds? ..... m [1]

(b) How many seconds did **Yuri** stop moving during his journey? ..... s [1]

(c) Average speed can be calculated from the graph.

(i) Complete the equation for average speed.

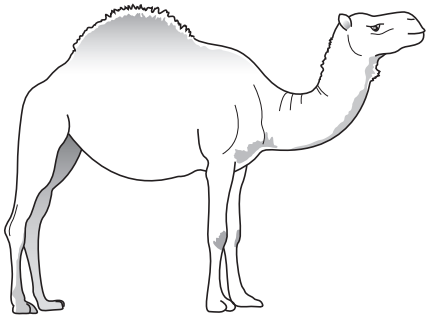
average speed =

..... [1]

(ii) Calculate Yuri's average speed during the whole journey.

Yuri's average speed ..... m / s [2]

4 **(a)** Look at the picture of a camel.



Camels live in hot dry deserts.

They have many adaptations to help them survive.

Complete the table to explain how a camel's adaptations help it survive.

The first one has been done for you.

adaptation	explanation
fat in hump only	so that the rest of the body has less insulation
large flat feet	.....
thick eyelashes	.....
does not produce sweat	.....

[3]

(b) Animals that live in the cold have different adaptations.

Suggest **two** adaptations that help animals survive in the cold.

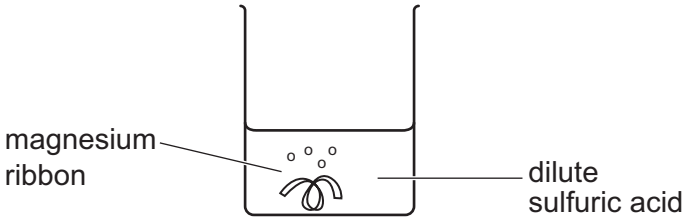
1 .....

2 .....

[2]

5 Mike makes a salt called magnesium sulfate.

He adds magnesium to dilute sulfuric acid.



He keeps adding magnesium to the dilute sulfuric acid until no more hydrogen gas is given off.

Some unreacted magnesium is left in the magnesium sulfate solution.

(a) Describe how Mike separates the unreacted magnesium from the magnesium sulfate solution.

.....

..... [1]

(b) Describe how Mike makes a dry sample of magnesium sulfate from magnesium sulfate solution.

.....

..... [1]

(c) Write a **word equation** for the reaction between magnesium and sulfuric acid.

..... + ... → ..... + ...

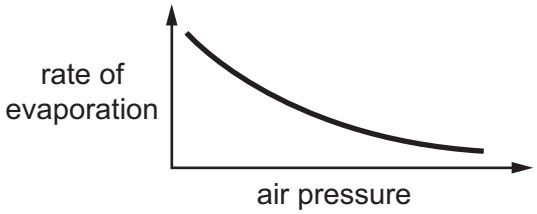
[2]

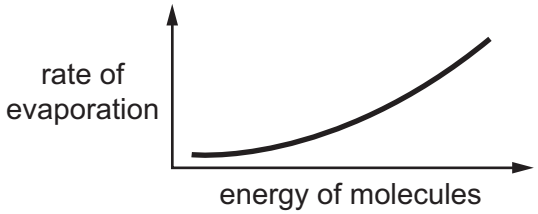
6 Lily and Angelique use the internet to find this information about evaporation.

Evaporation can happen when liquids are hot or cold.

Evaporation is related to the energy of molecules.

The rate of evaporation can change.





(a) What happens to the rate of evaporation when the **air pressure** increases?

.....

[1]

(b) **(i)** What happens to the rate of evaporation when the **energy of molecules** increases?

.....

[1]

(ii) Write down **one** way the energy of molecules could be increased.

.....

.....

[1]

7 Water and minerals move through flowering plants.

(a) Complete the sentences about how water and minerals move through a plant.

Choose parts of a plant from the list.

Each part can be used once, more than once or not at all.

palisade mesophyll **phloem** **root hair** **xylem**

Water and minerals enter plants through the ..... cells.

The water and mineral solution is transported in the stems through

..... cells.

The solution reaches the ..... cells in the leaves and is used for growth.

[3]

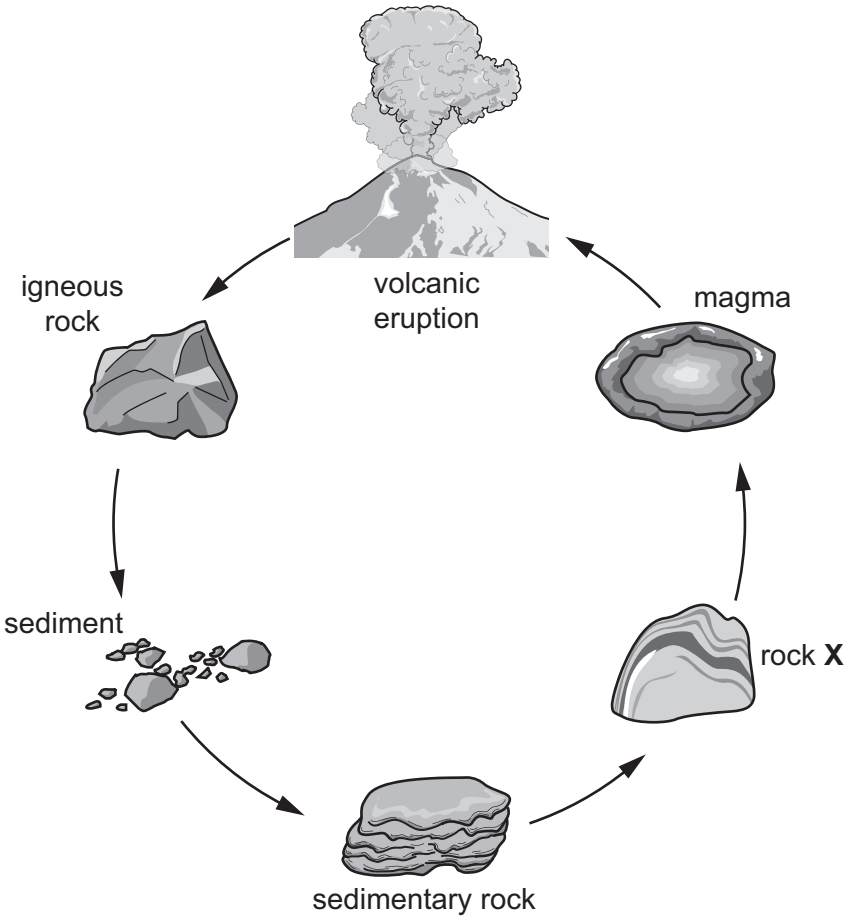
(b) Plants need water to make sugar.

Name **two other** things that plants need to make sugar.

..... **and** .....

[2]

8 The diagram shows different types of rocks and how they form.



(a) Sedimentary rocks can be turned into rock **X** by heat and pressure.

What type of rock is **X**?

..... [1]

(b) Which layer of the Earth contains magma?

Circle the correct answer.

atmosphere **inner core** **mantle** **outer core**

[1]

(c) Sedimentary rocks often contain the remains of dead animals and plants from millions of years ago.

What word is used to describe these remains?

..... [1]

(d) Different types of soil have different amounts of organic matter in them.

Which type of soil contains the most organic matter?

Circle the correct answer.

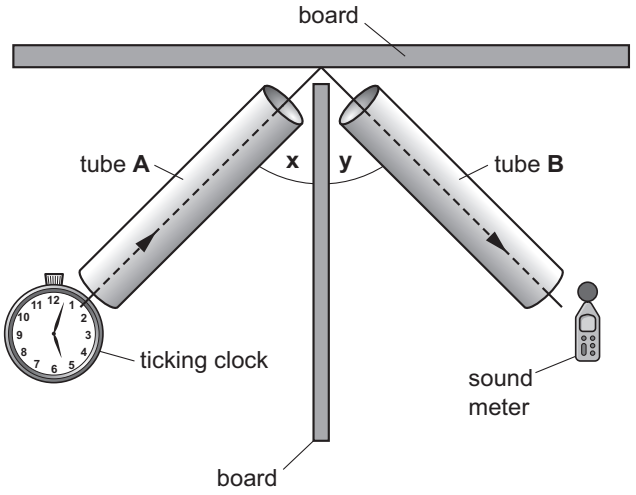
clay **loam** **sandy** **silt**

[1]

9 Sound can be reflected in the same way as light.

Safia and Yuri investigate the relationship between the angle of incidence, **x**, and the angle of reflection, **y**.

They use the apparatus in the diagram.



Yuri

- puts the ticking clock next to tube **A**
- puts the sound meter next to tube **B**
- uses the same value for angle **x**
- uses different values of angle **y**.

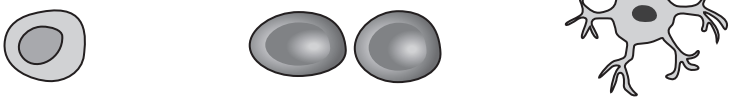
Safia writes down the sound level shown on the sound meter.

Complete the table about the variables.

variable to **change**	1. .....
variables to **control**	1. value for **x** 2. ..... 3. .....
variable to **measure**	1. .....

[4]

10 Look at the diagrams of cells.



cheek cell red blood cells nerve cell

(a) Describe **one** way the structure of a nerve cell is different to a cheek cell.

.....

[1]

(b) The structure of a red blood cell is adapted for its function.

Explain how.

function .....

adaptation .....

.....

[2]

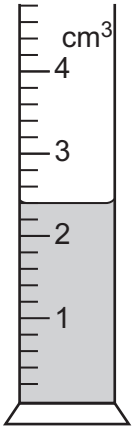
11 Mia investigates the temperature change during some reactions.

In each experiment Mia adds a solid to a liquid.

She measures the temperature of the liquid before and after adding the solid.

(a) Mia uses a measuring cylinder to measure the volume of liquid.

The diagram shows part of her measuring cylinder of liquid.



What is the volume of liquid in the measuring cylinder?

..... cm^3 [1]

(b) Here are Mia's results.

liquid added	temperature of liquid	solid(s) added	temperature of the liquid after solid is added	change in temperature	is the reaction exothermic or endothermic?
water	17	copper sulfate	20	+3	.....
water	17	citric acid and sodium hydrogencarbonate	14	.....	.....
copper sulfate solution	18	zinc	22	.....	.....

(i) She does not include some important information in the headings of the table.

Which unit is missing from the headings?

..... [1]

(ii) Calculate the change in temperature for each experiment.

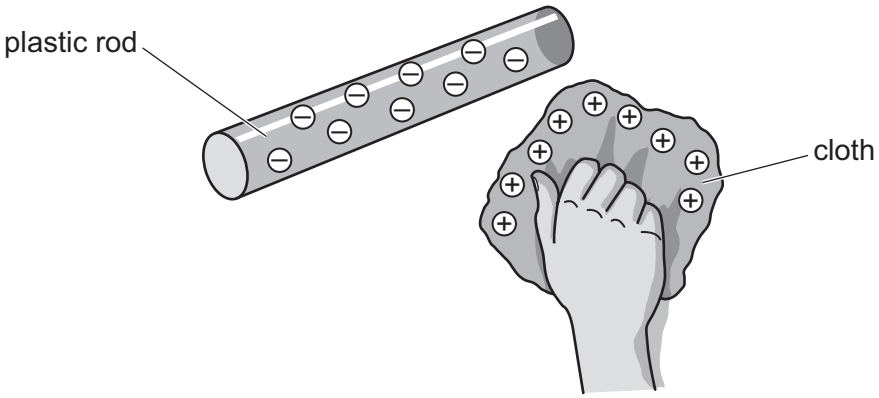
One has been done for you.

Write your answers in the table. [1]

(iii) Complete the table by writing endothermic or exothermic in the last column. [1]

12 Some objects become electrically charged.

(a) Oliver draws a diagram of two charged objects.



Explain how the objects become charged.

.....

.....

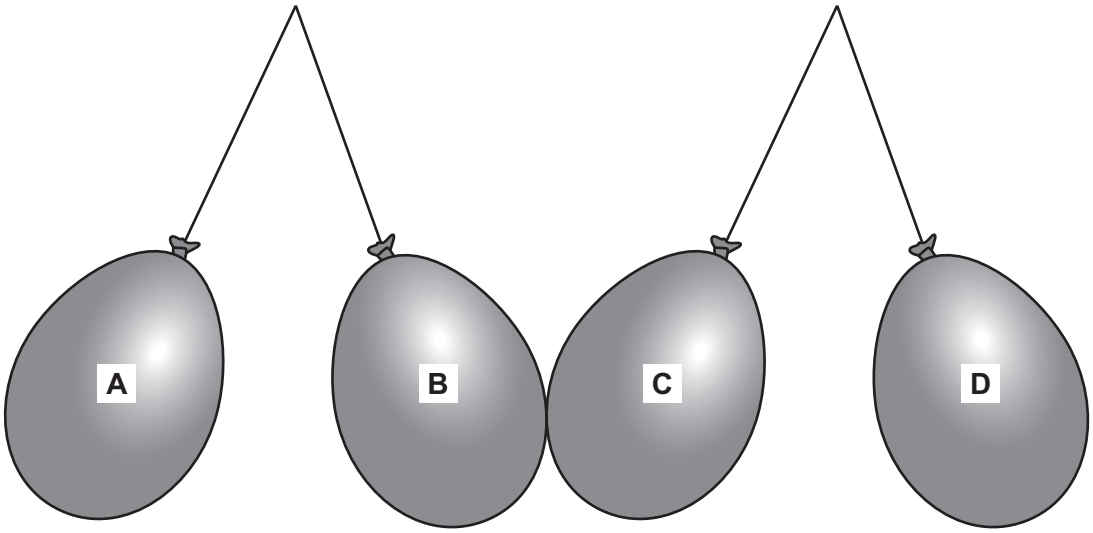
..... [2]

(b) Complete the sentences.

Opposite charges ..... .

Like charges ..... . [1]

(c) Oliver puts charged balloons next to each other.



Balloon **A** has a positive charge.

What are the charges on the other balloons?

A is positive.

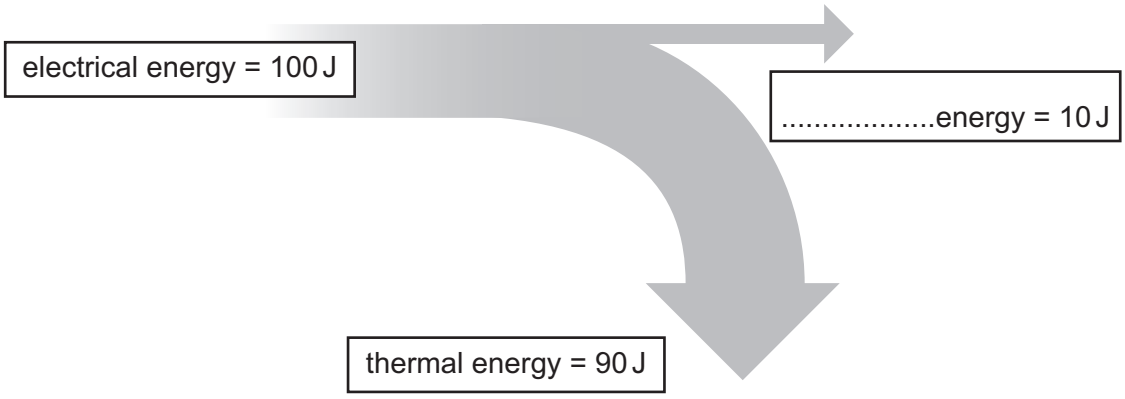
B is ..... .

C is ..... .

D is ..... . [1]

13 Diagrams are used to show how energy is transferred.

Lamps transfer energy.



Complete the diagram to show the type of energy that is 10 J. [1]