Cambridge Lower Secondary Checkpoint

CANDIDATE NAME

SCIENCE **1113/02**

Paper 2 **April 2021**

45 minutes

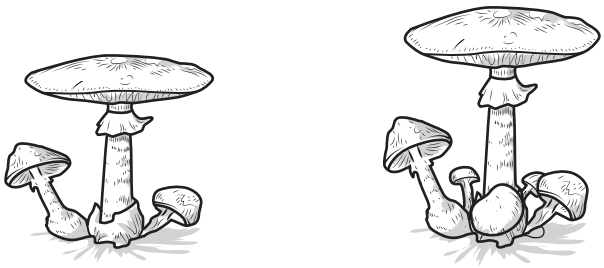
Candidates answer on the Question Paper.

Additional Materials: Pen, Pencil, Ruler, Calculator

1 Yuri draws a picture of a fungus living near some trees.

After three days he draws another picture of the same fungus.

Look at these two pictures.



day 1 day 4

(a) The pictures show evidence that this fungus is a living organism.

What is this evidence?

It becomes taller ➡ growth [1]

(b) Yuri's teacher says that there are more characteristics of living organisms.

Write down three **other** characteristics of living organisms.

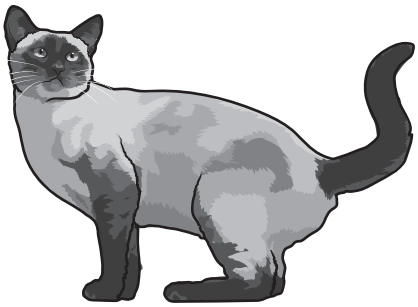
1 excretion

2 nutrition

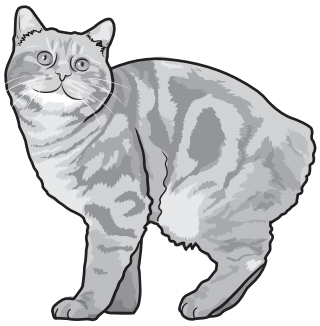
3 reproduction

[3]

2 These varieties of cat belong to the same species.



Siamese cat



Manx cat

(a) Complete this definition of a species.

Animals that belong to the same species are able to ..... reproduce ..... together to produce ..... fertile ..... offspring.

[2]

(b) Siamese cats and Manx cats show variation within a species.

Describe **two** differences, shown in the diagram, between Siamese cats and Manx cats.

1 ..... Siamese cat has a long tail, Manx cat does not have tail .....

.....

2 ..... Siamese cat does not have stripe, Manx cat has stripes .....

.....

[2]

3 This question is about different types of chemical reaction.

(a) Complete the sentences.

Choose from the list.

combustion **displacement** **neutralisation** **respiration** **rusting**

(i) Burning a fuel in air is called ..... combustion ..... . [1]

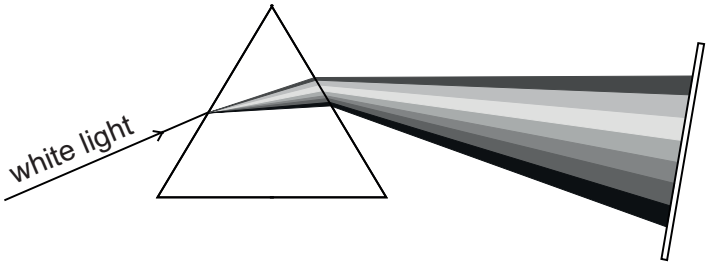
(ii) The reaction between an acid and an alkali is called ..... displacement ..... . [1]

(b) Complete the word equation for the reaction between calcium carbonate and hydrochloric acid.

calcium carbonate CaCO3	+	hydrochloric acid HCl	→	calcium chloride CaCl2	+	water	+	carbon dioxide

[2]

4 Look at the diagram. It shows white light being split into different colours.



Complete the sentences.

Choose from the list.

dispersion **eight** **filter** **mirror**

prism **reflection** **refraction** **screen**

seven **six** **spectrum**

When white light enters a ..... **prism** ..... it is split into ..... **seven** .....

different colours.

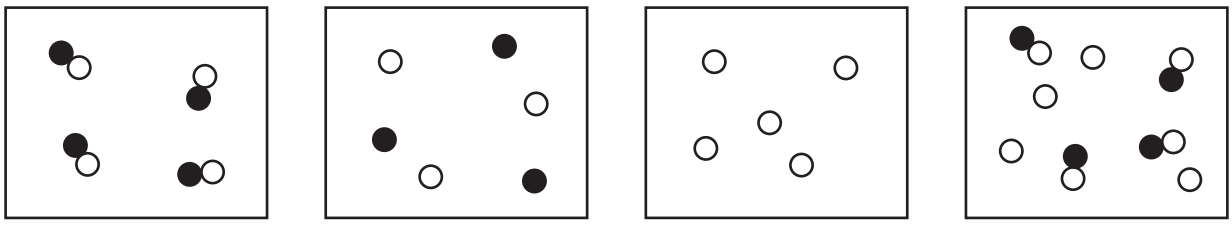
This process is known as ..... **dispersion** ..... .

The different colours are known as the colours of the ..... **spectrum** ..... .

[4]

5 This question is about elements, compounds and mixtures.

(a) Look at the boxes. They show the particles in some substances.



A **B** **C** **D**

Which box shows a mixture of two elements?

Circle the correct answer.

A **(B)** **C** **D**

[1]

(b) A compound is made of only sodium and chlorine.

What is the **name** of this compound?

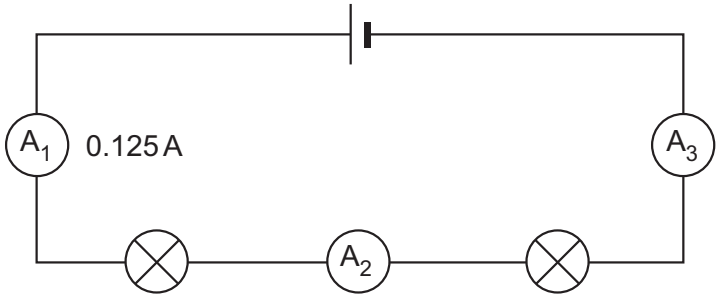
..... **Sodium chloride** ..... [1]

6 Mia measures the current in different electrical circuits.

(a) Write down the name of the piece of equipment used to measure current.

Ammeter [1]

(b) Mia connects an electrical circuit with one cell and two lamps.



The reading on $\mathbf{A_1}$ is 0.125 A.

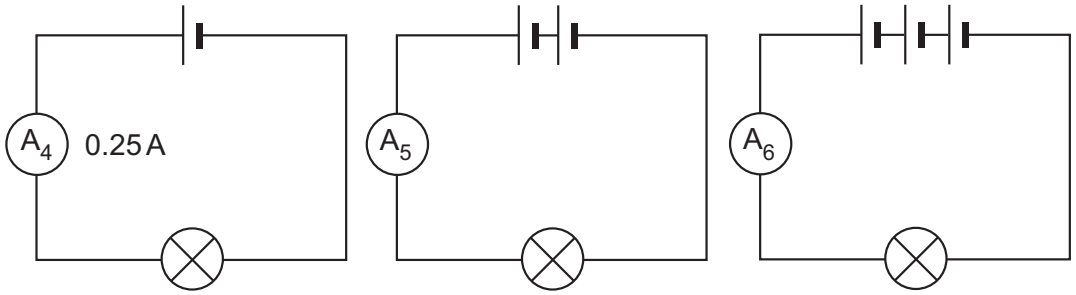
Write down the **two** missing readings.

The reading on $\mathbf{A_2}$ is 0.125 A.

The reading on $\mathbf{A_3}$ is 0.125 A.

[1]

(c) Mia connects **three** more circuits using the same size cells and lamps.



The reading on $\mathbf{A_4}$ is 0.25 A.

Write down the **two** missing readings.

The reading on $\mathbf{A_5}$ is 0.5 A.

The reading on $\mathbf{A_6}$ is 0.75 A.

[2]

7 Chen measures the pulse rate of his friends before and after exercise.

All the friends do the same amount and level of exercise.

Here are his results.

friend	pulse rate before exercise in beats per minute	pulse rate after exercise in beats per minute	change in pulse rate in beats per minute
Carlos	74	104	30
Mike	72	105	33
Oliver	69	98	29

(a) Calculate the change in pulse rate for each friend.

Write your answers in the table. [1]

(b) Are Chen's results **reliable**?

Yes ☐ No ☑

Explain your answer.

He did not repeat the measurement [1]

(c) Chen makes this statement.

'Mike is the fittest boy in my school.'

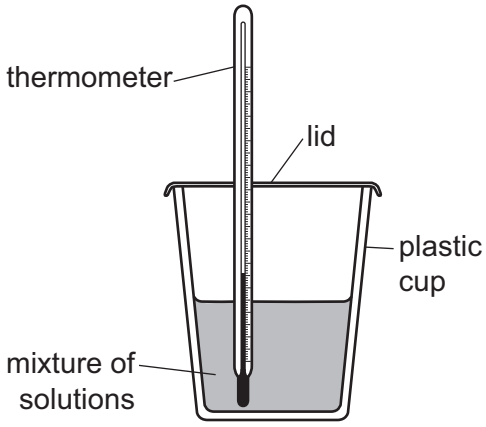
Write down **two** reasons why Chen's statement is **not** correct.

1 The experiment is carried out between 3 boys not all the boys in his school

2 There is no connection between pulse rate and fitness

[2]

8 Look at the diagram. It shows solutions being mixed in a plastic cup.



Look at the table. It shows the results of five experiments.

experiment	temperature before mixing solutions in °C	temperature after mixing solutions in °C
A	15	26
B	15	10
C	15	15
D	15	32
E	15	27

(a) **(i)** Which experiment transfers the most thermal (heat) energy into the solutions?

D [1]

(ii) Complete the sentence.

The reaction in experiment B is **endothermic** because

the temperature after is lower than the tempearture before. [1]

(b) Suggest a reason for the result in experiment **C**.

There is no chemial reaction [1]

9 Priya measures the distance a swimmer moves every five seconds.

She investigates two different swimming styles.

She writes her results in a table.

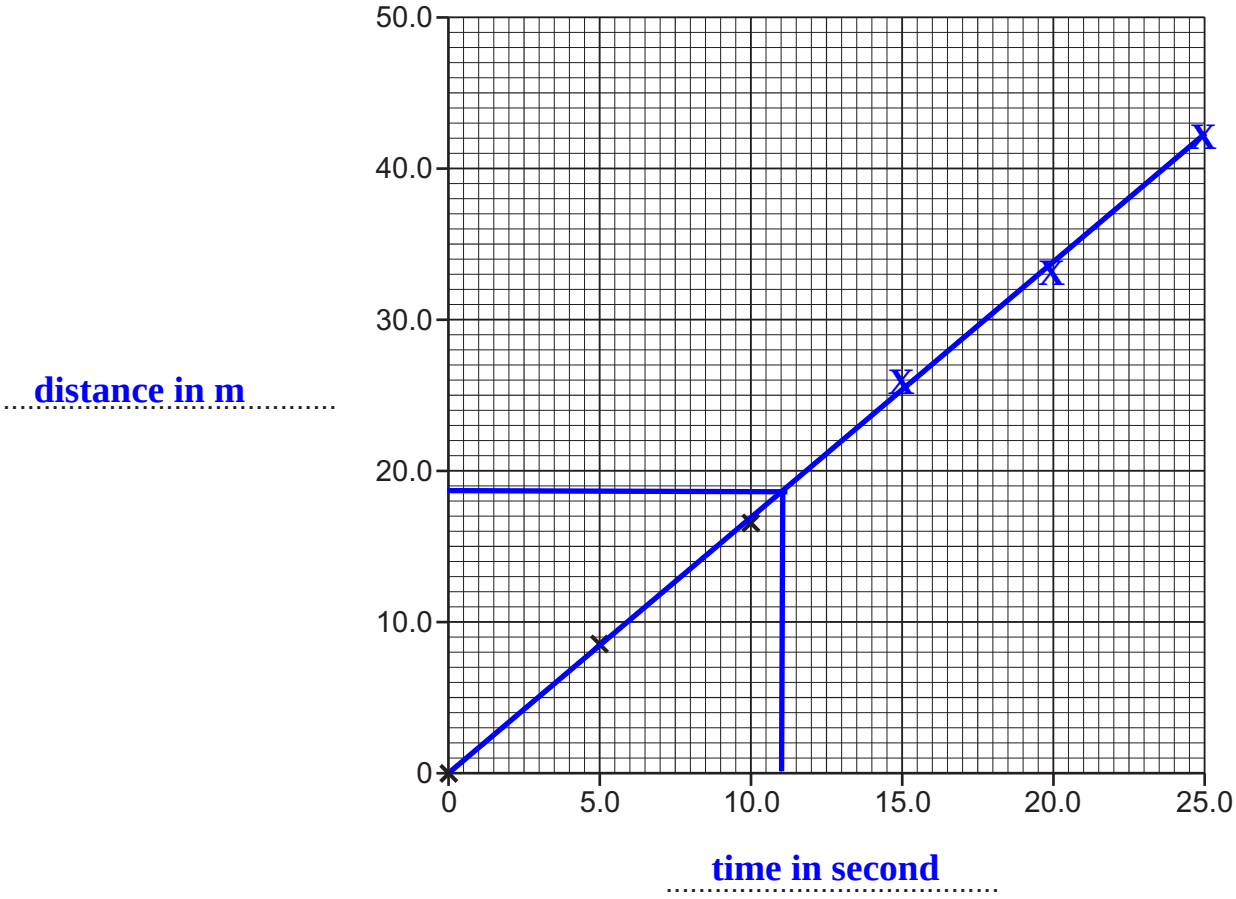
time in s	distance in m	
	butterfly style	backstroke style
0.0	0.0	0.0
5.0	8.5	9.0
10.0	16.5	18.0
15.0	25.0	34.5
20.0	33.0	35.0
25.0	42.0	46.0

(a) One of the results is **anomalous**.

Circle the **anomalous** result in the table. [1]

(b) (i) Complete the distance/time graph for the **butterfly style**:

- label the *x*-axis and *y*-axis
- plot the other three points
- draw a line of best fit.



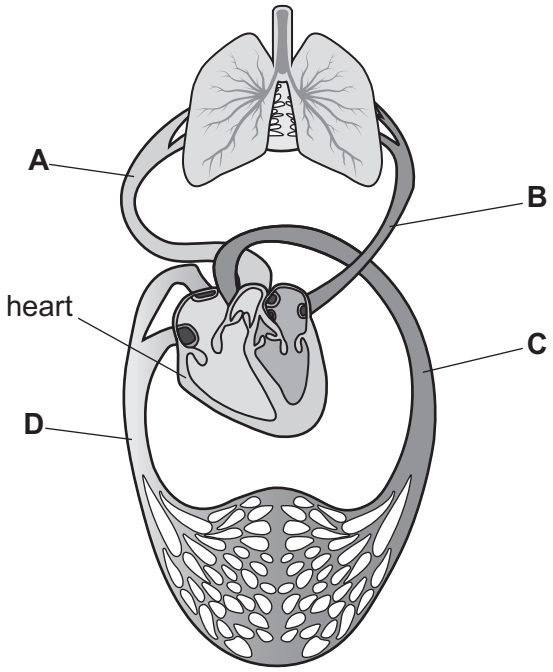
[3]

(ii) Predict the distance the swimmer moved in the first 12 seconds.

19 m [1]

10 The diagram shows the heart of a human.

The darker grey shading shows oxygenated blood.



artery: out of heart

vein: into heart

Use the information in the diagram to match each **letter** with the correct **description of the blood vessel**.

letter	description of the blood vessel
A	artery taking deoxygenated blood to the lungs
B	artery taking oxygenated blood to the body
C	vein taking deoxygenated blood to the heart
D	vein taking oxygenated blood to the heart

[3]

11 Look at the chemical symbols for four metals.

Cu **Zn** **Na** **Ca**

Answer the questions.

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

(a) Which of the four metals is the **most** reactive?

Na ..... [1]

(b) Which of the four metals does **not** react with water or dilute hydrochloric acid?

Cu ..... [1]

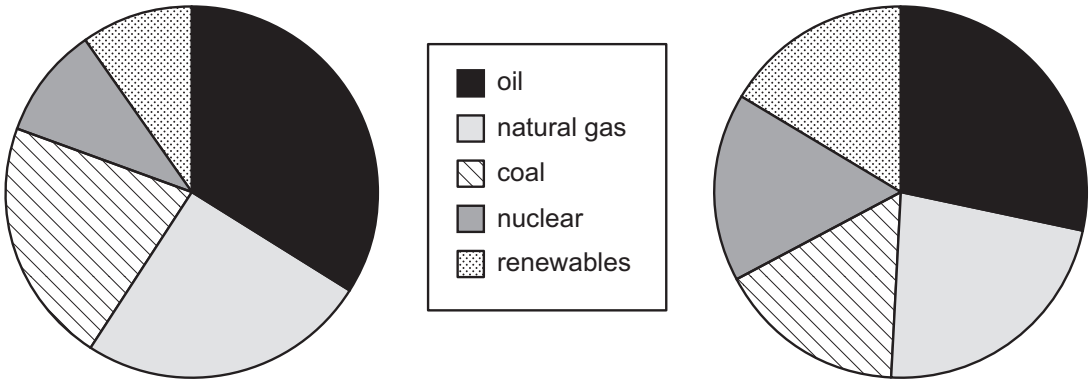
(c) Which of the four metals reacts **slowly** with dilute hydrochloric acid?

Ca ..... [1]

(d) Which of the four metals is **lowest** in the reactivity series?

Cu ..... [1]

12 Safia draws two pie charts to show the energy resource use in her country.



Year 2018 Year 2040

The pie chart for the year 2040 shows the predicted energy resource use.

The predicted **natural gas** use decreases from 2018 to 2040.

The predicted **renewables** use increases from 2018 to 2040.

(a) Describe two **other** changes in predicted energy resource use from 2018 to 2040.

1 Oil is predicted to decrease .....

.....

2 Nuclear is predicted to increase .....

..... [2]

(b) (i) Name one renewable energy resource.

Wind [1]

(ii) Suggest why the renewable energy resource use is predicted to **increase** from 2018 to 2040.

Because non-renewable resourses will run out in the near future

[1]

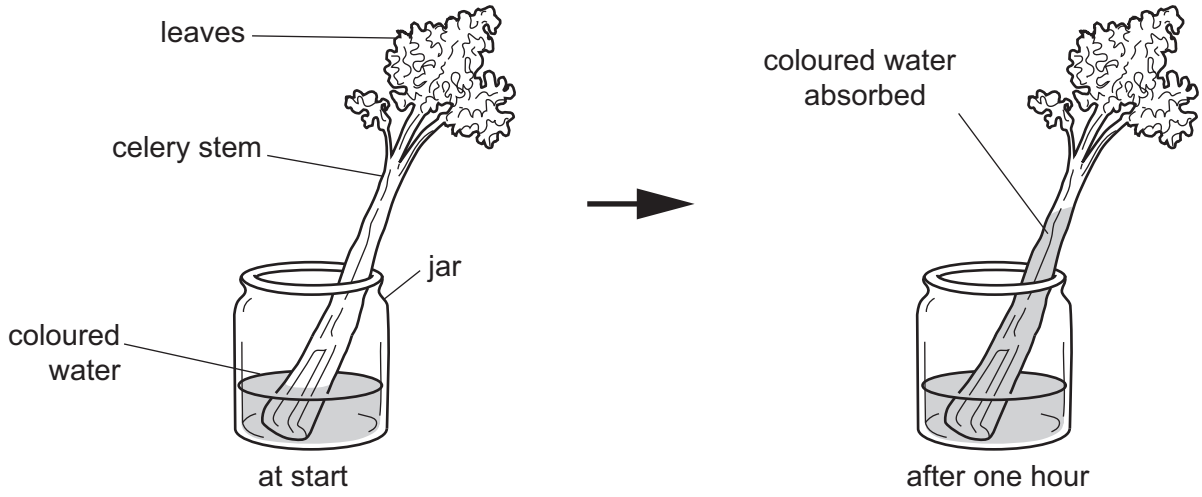
13 Angelique investigates how quickly plants absorb water.

She uses the stem and leaves of a plant called celery.

She puts a stem of celery in a jar of coloured water.

After one hour she looks at the celery to see how much coloured water it has absorbed.

This is shown in the diagram.



(a) Suggest how Angelique measures the amount of coloured water the celery has absorbed.

She can measure the distance that dye has travelled up the stem

[1]

(b) Angelique also investigates the effect of temperature on the absorption of water.

State **two** variables that Angelique controls in this investigation.

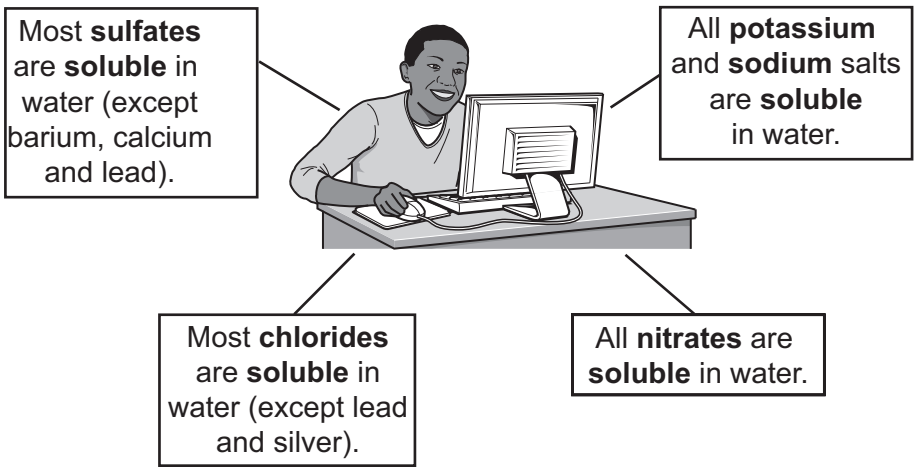
1 Light intensity

2 The type of the dye in water

[2]

14 Carlos researches the solubility of different salts.

He finds this information on the internet.



Use the information to answer these questions.

(a) Write down the name of one **insoluble** sulfate.

Barium sulfate [1]

(b) Look at the chemical formula of a salt.

KC*l*

Is the salt soluble?

Yes ✓ No

Explain your answer.

Because all potasium salts are soluble in water

[1]