Cambridge Assessment International Education

Science

Stage 6

Paper 1

35 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 40.
- The number of marks for each question or part question is shown in brackets [ ].

1 Elephants have a similar circulatory system to humans.

(a) Write down the names of the **three** types of blood vessels in an elephant.

1 .....

2 .....

3 .....

[3]

(b) Write down the function of the heart.

..... [1]

(c) One of the functions of the blood in an elephant is to transport the gas carbon dioxide.

Write down **two other** substances the blood transports.

1 .....

2 .....

[2]

2 Mia investigates what happens when different colourless solutions are mixed with a colourless dilute acid.

In her first experiment she:

- measures the temperature of the acid in a glass beaker
- adds a small volume of a colourless solution
- measures the temperature of the mixture in the glass beaker
- records any other observations.

Mia repeats the experiment five more times with different colourless solutions.

Look at the results of her investigation.

colourless solution	temperature of acid at start in °C	temperature after mixing in °C	observations
A	20	20	bubbles in a colourless solution
B	20	32	bubbles in a colourless solution
C	20	14	colourless solution
D	20	20	white solid
E	20	20	colourless solution
F	20	28	green solution

(a) Which colourless solution gives the **greatest** temperature change?

..... [1]

(b) Which colourless solution does **not** react with the acid? .....

Give **two** reasons for your answer.

reason 1 .....

.....

reason 2 .....

.....

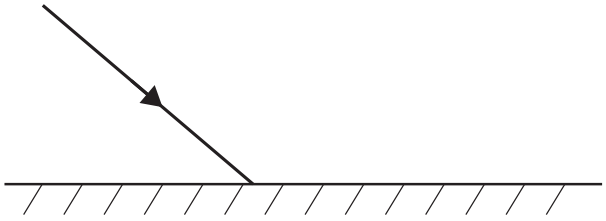
[3]

3 Blessy investigates rays of light.

(a) Look at the diagram.

It shows a ray of light hitting a plane mirror.

Complete the diagram by drawing the ray of light after it hits the plane mirror.



plane mirror

[1]

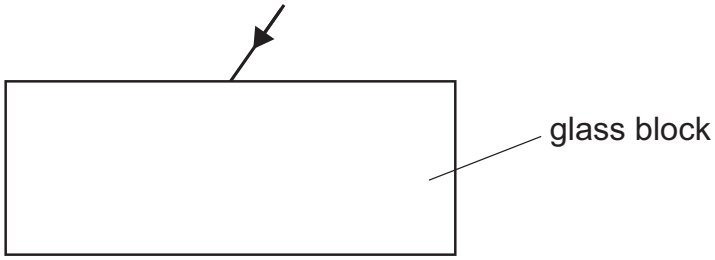
(b) Name the process that describes what happens when the ray of light hits the plane mirror.

.....

[1]

(c) Look at the diagram.

It shows a ray of light hitting a glass block.



The ray of light changes direction as it enters the glass block.

Complete the diagram by drawing the ray of light as it enters and leaves the glass block.

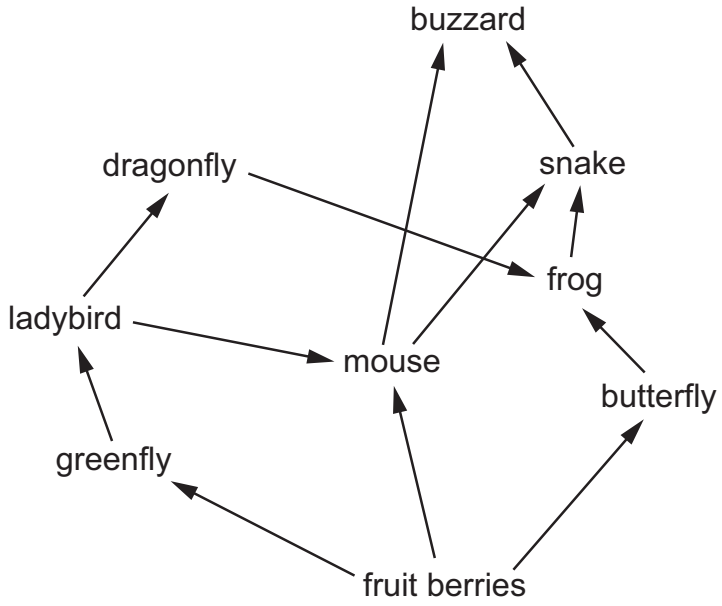
[3]

(d) Name the process that describes the change of direction when the ray of light enters the glass block.

.....

[1]

4 Priya and Rajiv find this food web on the internet.



(a) What do the arrows in the food web represent?

.....

[1]

(b) Write down a food chain from the food web that has **only four** organisms.

[2]

(c) A farmer sprays the fruit berries with a toxic substance to kill the greenfly that are eating the fruit berries.

Explain why some of the toxic substance kills the buzzard.

.....

.....

.....

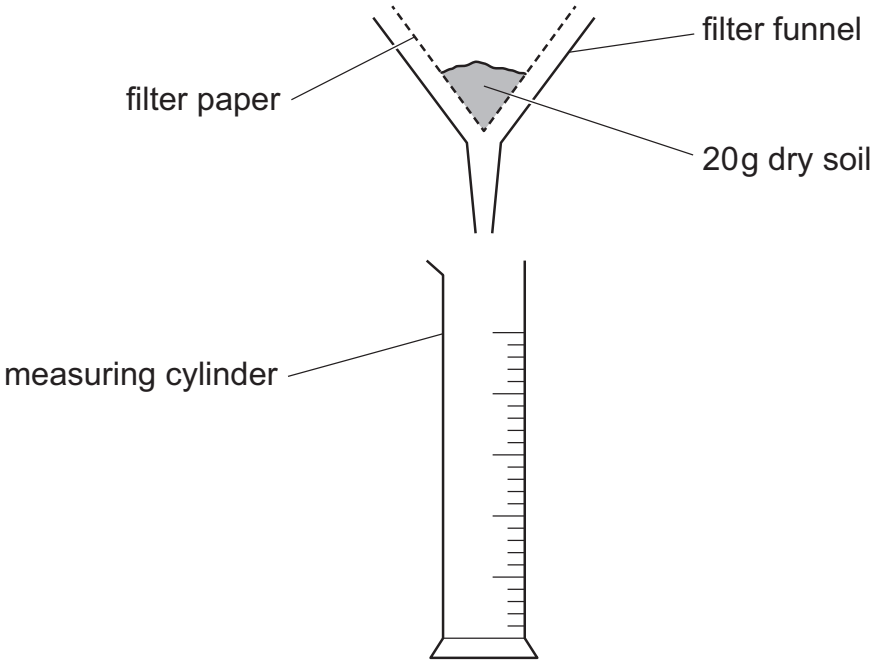
[2]

5 Soils are a mixture of clay, sand and an organic content called humus.

Chen investigates the drainage of some dry soils.

Chen:

- places 20 g of dry soil **W** into the equipment shown



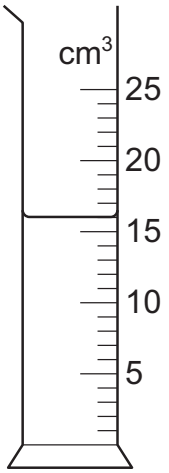
- pours 50 cm^3 of water onto the dry soil
- measures the volume of water that drains into the measuring cylinder in one minute.
- repeats the experiment for each of the dry soils, **X**, **Y** and **Z**.

Chen's results are shown in this table.

soil	percentage of			volume of water collected after one minute in cm^3
	clay	sand	humus	
W	20	70	10	30
X	15	75	10	36
Y	70	20	10	10
Z	50	40	10	.....

(a) Look at the diagram.

It shows the measuring cylinder of water collected for soil **Z**.



Write down, in Chen's results table, the volume of water collected for soil **Z**. [1]

(b) Explain why the volume of water added to the dry soil is always 50 cm^3.

.....

..... [1]

(c) Write down the dependent variable in this investigation.

..... [1]

(d) Which soil has the best drainage?

Circle the correct answer.

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

[1]

(e) Chen repeats the investigation with a dry soil containing 90% sand and 10% humus.

Predict the volume of water collected.

..... cm^3 [1]

6 Carlos investigates the time it takes salt to dissolve in water.

In his first experiment Carlos:

- pours 100 cm^3 of water into a glass beaker
- measures the temperature of the water
- adds 5 g of salt to the water
- stirs the mixture
- records the time taken for the salt to dissolve.

Carlos repeats the experiment using different temperatures of water.

Look at the results of his investigation.

temperature of water in °C	**time taken for salt to dissolve in seconds**
20	120
30	60
40	31
50	14
60	7

(a) Describe the pattern in these results.

.....

..... [1]

(b) Use the particle model to explain this pattern.

.....

..... [1]

(c) Circle the best way to present these results.

bar chart

line graph

pie chart

scatter graph

[1]

(d) Carlos decides to do more experiments.

He repeats each temperature once more.

Explain why this is a good idea.

.....

..... [1]

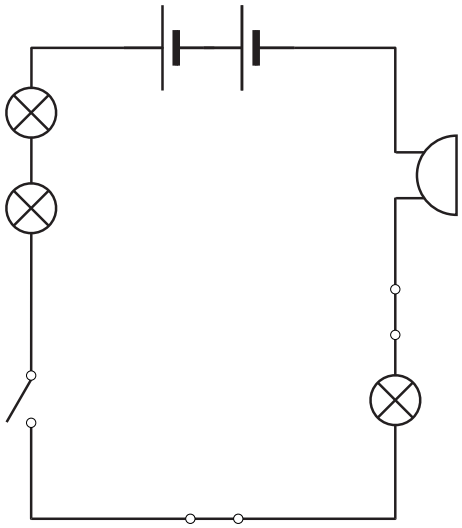
(e) Suggest why Carlos does **not** do any experiments with a temperature higher than 60 °C.

.....

..... [1]

7 Scientists use models to describe electrical circuits.

Look at this model of an electrical circuit.



(a) Complete the table about the components in this circuit.

component	number of components in the circuit
buzzer	
cell	
closed switch	
open switch	
lamp	

[3]

(b) Explain if the model shows a series circuit or a parallel circuit.

type of circuit .....

explanation .....

.....

[1]

8 This question is about objects in the Solar System.

(a) Complete the table by adding the correct name of each planet.

planet	distance from the Sun in millions of km
	58
	228
	108
	150
	4495
	2871
	1434
	779

[3]

(b) A planet moves in a path around the Sun.

Write down the name of this path.

..... [1]

(c) The Moon moves around the Earth.

Circle the time it takes the Moon to complete **one** cycle around the Earth.

24 hours **28 days** **1 week** **365 days**

[1]

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