

**Cambridge  
Checkpoint**

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
Cambridge Checkpoint

CANDIDATE  
NAME

CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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**SCIENCE**

Paper 2

**1113/02**

**April 2012**

**45 minutes**

Candidates answer on the Question Paper.

Additional Materials: Ruler

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use a soft pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

**DO NOT WRITE IN ANY BARCODES.**

Answer **all** questions.

You should show all your working in the booklet.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [ ] at the end of each question or part question.

The total number of marks for this paper is 50.

**For Examiner's Use**

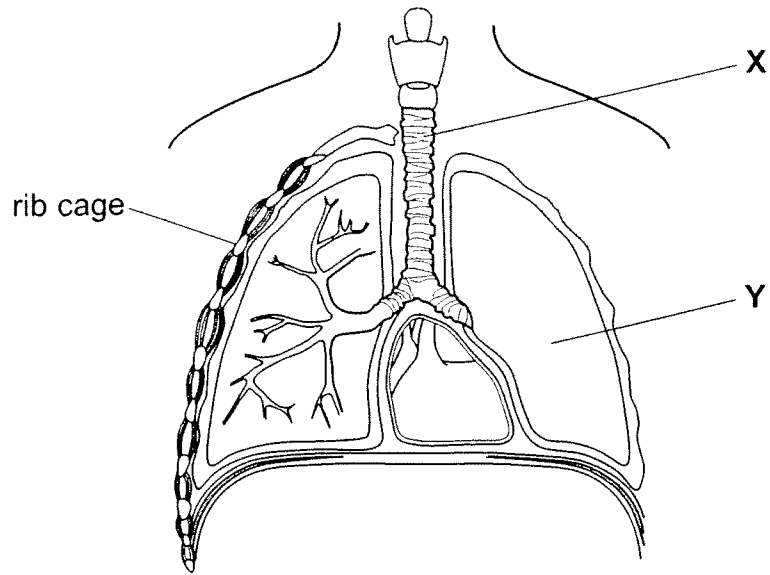
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This document consists of **19** printed pages and **1** blank page.





1 The diagram shows some of the organs in the respiratory system.



(a) Name parts X and Y.

part X .....

part Y .....

[1]

(b) Gaseous exchange takes place inside organ Y.

Which gases are exchanged?

..... and .....

[1]



(c) The rib cage moves when you breathe in and out.

Complete the table to show how the rib cage moves.

Put **one** tick (✓) in each row.

activity	moves up and out	moves down and in
breathing in		
breathing out		

[1]

(d) Write **one** other function of the rib cage.

.....

[1]





2 The Periodic Table of elements is arranged in groups and periods.

The diagram shows the first 20 elements of the Periodic Table.

Period number									
1	hydrogen							helium	
2	lithium	beryllium		boron	carbon	nitrogen	oxygen	fluorine	neon
3	sodium	magnesium		aluminium	silicon	phosphorus	sulfur	chlorine	argon
4	potassium	calcium							

(a) Which of the following are correct statements about the Periodic Table?

Tick (✓) the correct boxes.

The reactivity decreases down Group 1.	<input type="checkbox"/>
The atomic number increases across a period.	<input type="checkbox"/>
Across a period the elements change from metals to non-metals.	<input type="checkbox"/>
Boron, B, is in period 3 and group 2.	<input type="checkbox"/>

[2]

(b) Which element is the most reactive metal shown on the table?

.....

[1]

(c) Magnesium reacts with oxygen to form a white solid compound.

What is the name of this compound?

.....

[1]

(d) Molybdenum is a typical metal.

Write one physical property of molybdenum.

.....

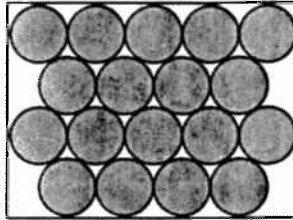
[1]





4 Copper is a metal.

The diagram shows the arrangement of particles in solid copper at 25 °C.



Copper melts at 1084 °C and boils at 2562 °C.

(a) What is the state of matter of copper at 1000 °C?

Tick (✓) the correct answer.

- gas
- liquid
- solid

[1]

(b) What is the state of matter of copper at 2000 °C?

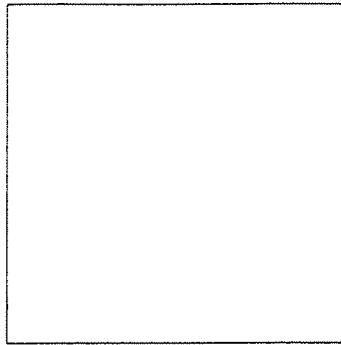
Tick (✓) the correct answer.

- gas
- liquid
- solid

[1]



(c) Draw the arrangement of particles of copper in copper gas.



[1]

(d) Describe the changes in the **motion** and the **arrangement** of particles in solid copper when it melts.

change in motion

.....  
.....

change in arrangement

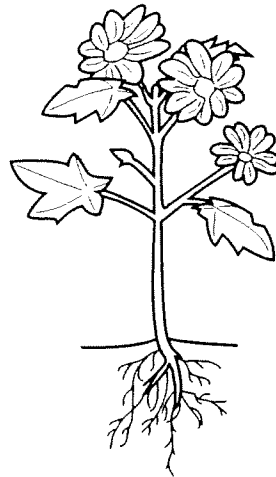
.....  
.....

[2]

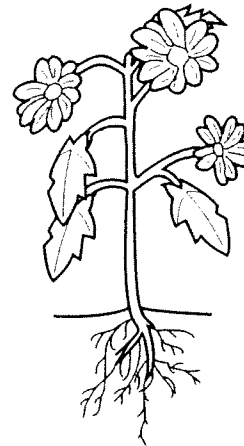




5 The diagrams show a healthy plant and a wilting plant.



healthy plant



wilting plant

The table shows the volume of water entering and leaving four different plants in one day.

plant	water entering the plant / cm <sup>3</sup>	water leaving the plant / cm <sup>3</sup>
A	15	15
B	21	14
C	5	16
D	24	22

(a) Which plant, A, B, C or D, will be the first to wilt?

..... [1]

(b) Alwin plans an investigation to find out if plants lose more water as the temperature increases.

(i) State the variable that he needs to change in his investigation.

..... [1]

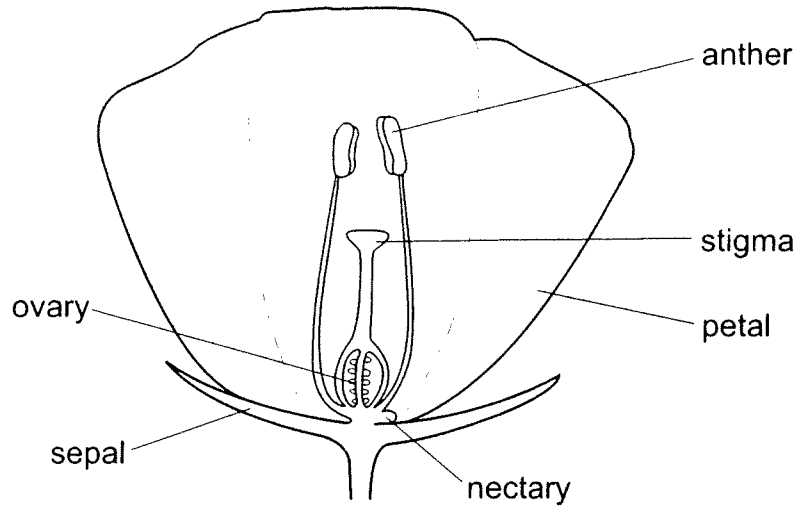
(ii) Suggest **one** variable that Alwin should keep the same in his investigation.

..... [1]



DO NOT WRITE IN THIS MARGIN

6 The diagram shows a flower.



(a) Which part of the flower produces pollen?

..... [1]

(b) Which part of the flower receives the pollen?

..... [1]

(c) How can you tell that this flower is pollinated by an insect?

Write **two** reasons.

reason 1 .....

reason 2 ..... [2]





7 In the early 1800s a scientist called Dalton introduced a simple atomic theory.

He believed that an atom

- was the smallest particle of an element
- could not be split up

In the early 1900s a scientist called Rutherford did some experiments that showed that Dalton's atomic theory was not correct. Rutherford published a different atomic theory.

His theory was that an atom had

- a very small nucleus at the centre
- electrons that orbited the nucleus

Later in the century, scientists discovered that the nucleus was made from smaller particles called protons and neutrons.

(a) Why is it important that scientists publish their results?

.....  
 .....

[1]

(b) How did Rutherford show that Dalton's atomic theory was not correct?

.....

[1]

(c) Rutherford's atomic theory was based on evidence from experiments.

Nowadays, scientists know that Rutherford's atomic theory is not correct.

How did scientists tell that Rutherford's atomic theory was not correct?

.....  
 .....

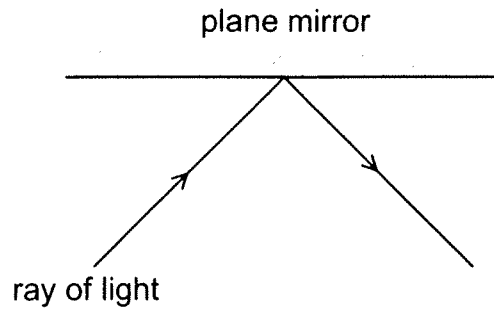
[1]





8 This question is about light.

(a) The diagram shows a ray of light hitting a plane mirror.



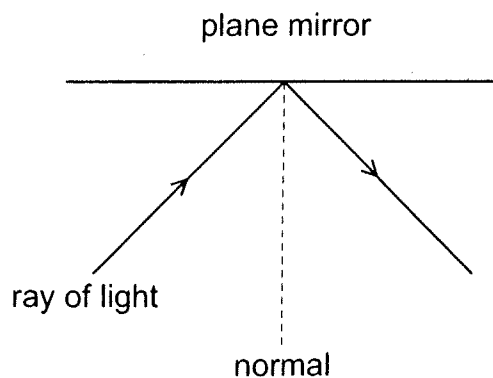
(i) What happens to the ray of light as it changes direction at the plane mirror?

Tick (✓) the correct box.

- diffraction
- dispersion
- refraction
- reflection

[1]

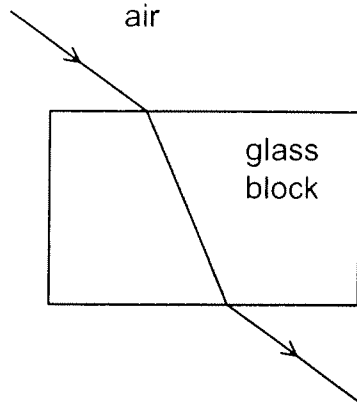
(ii) Label the angle of incidence on the diagram below.



[1]



(b) This diagram shows a ray of light passing through a glass block.



What happens to the light as it passes from the air into the glass?

Tick (✓) the correct box.

- diffraction
- dispersion
- refraction
- reflection

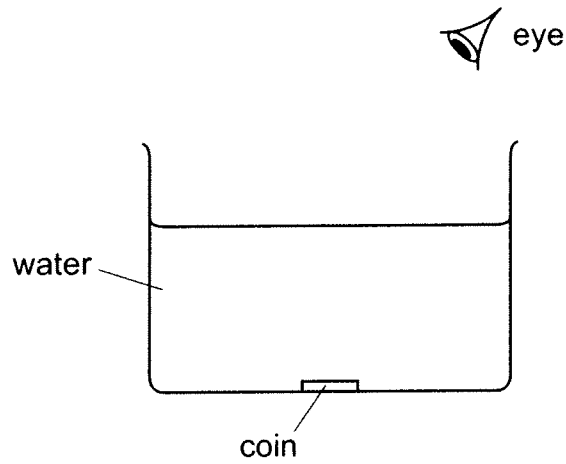
[1]





(c) Gita looks at a coin in a bowl of water.

Draw, on the diagram, the path of a light ray to show how Gita can see the coin.



[1]



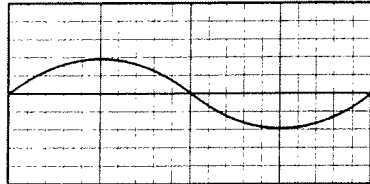
9 Blessy works in a recording studio.

She uses an oscilloscope to study sounds.

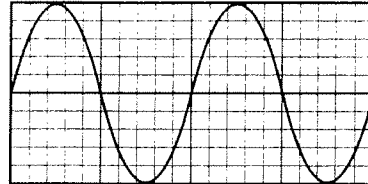
The oscilloscope shows the trace of a sound wave.

The diagrams show the traces made by four sounds.

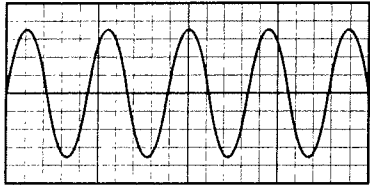
A



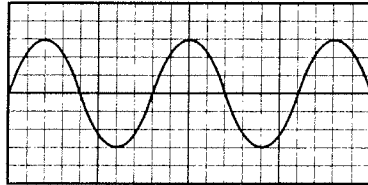
B



C



D



(a) Tick (✓) the **two** correct sentences.

Sound **A** is louder than sound **C**.

Sound **A** has a lower pitch than sound **B**.

Sound **B** has a higher pitch than sound **D**.

Sound **D** is louder than sound **A**.

[2]

(b) Complete these sentences. Choose from **A, B, C** or **D**.

The sound with the largest amplitude is .....

The sound with the highest frequency is ..... [2]





10 Petronella investigates several indicators.

She finds this table on the internet.

indicator	pH 1	pH 4	pH 7	pH 10	pH 13
methyl orange	red	yellow	yellow	yellow	yellow
phenolphthalein	colourless	colourless	colourless	pink	pink
Universal indicator	red	orange	green	blue	purple

(a) Petronella tests a liquid with some of the indicators.

The table shows her results.

indicator	colour of the indicator in the liquid
methyl orange	red
phenolphthalein	colourless

Estimate the pH value of the liquid.

..... [1]

(b) Litmus is another indicator.

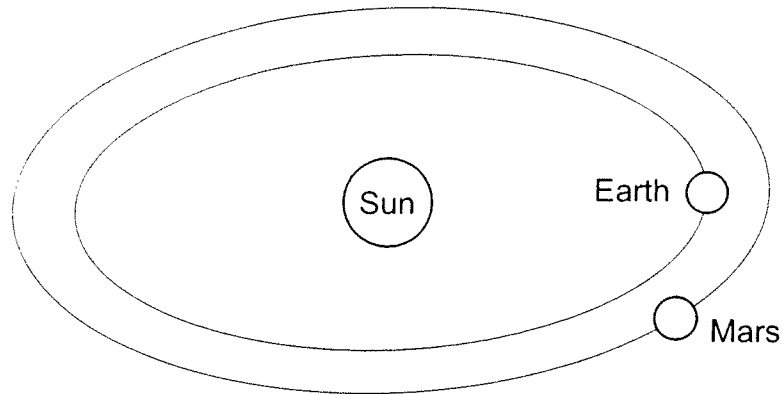
Complete the sentence about the colour of litmus.

Litmus is ..... in acid and ..... in alkali. [1]



11 Earth and Mars are planets in the Solar System.

Look at the diagram that shows the orbits of these planets around the Sun.



(a) Write the name of a planet that is

(i) closer to the Sun than Earth

.....

(ii) further away from the Sun than Mars.

[1]

.....

(b) How long does it take Mars to orbit the Sun?

[1]

Put a tick (✓) in the correct box.

less time than an Earth year	<input type="checkbox"/>
the same time as an Earth year	<input type="checkbox"/>
more time than an Earth year	<input type="checkbox"/>

[1]

(c) Mars is not a light source but we can still see it in the night sky.

Explain how it is possible to see Mars in the night sky.

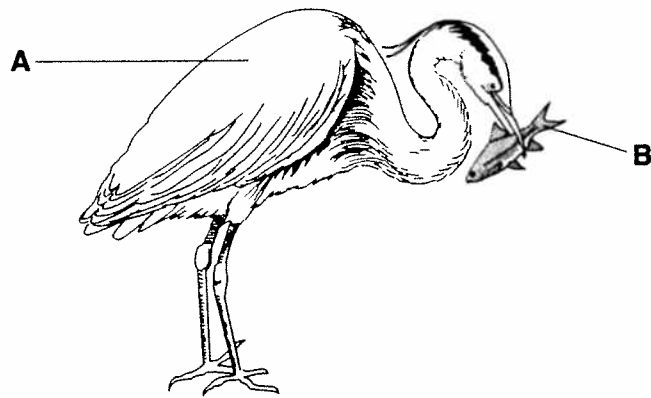
.....

[1]





12 The drawing below shows two organisms labelled **A** and **B**.



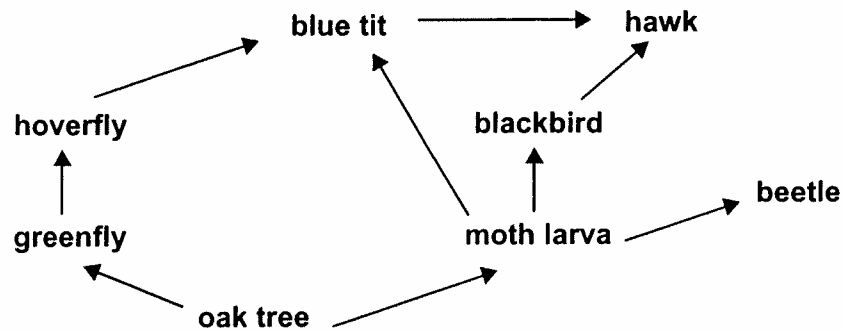
(a) Using the letter **A** or **B**, say which organism is

1 the predator .....

2 the prey .....

[1]

(b) The diagram below shows part of the food web in an oak wood.



(i) Name the producer in this food web.

.....

[1]

(ii) Write down a complete food chain from the web with exactly four organisms in it.

.....

[1]

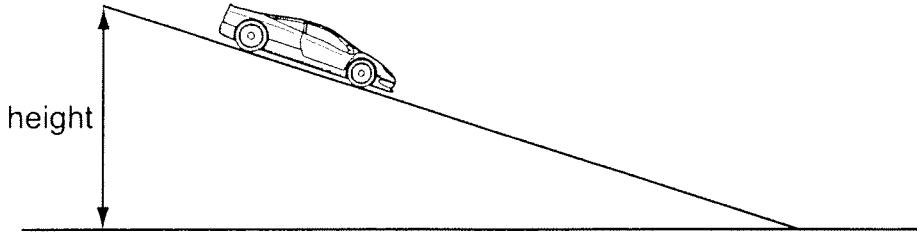
(iii) From what source does the oak tree obtain its energy?

.....

[1]



13 Jamilah investigates how the height of a slope affects the speed of a toy car rolling down the slope.

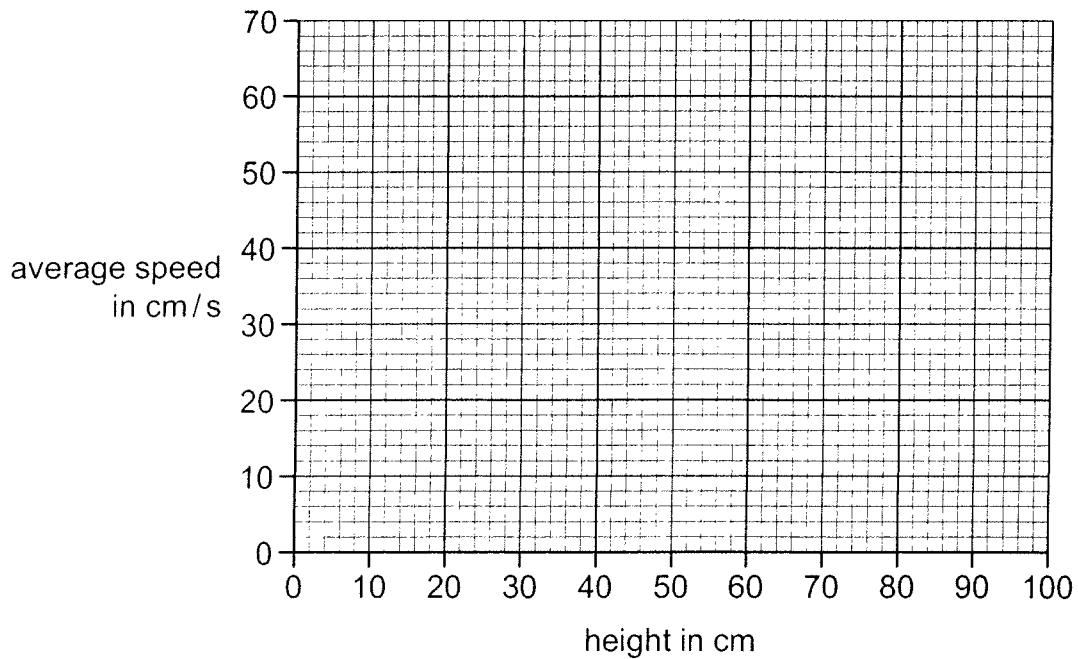


She changes the height of the slope and calculates the average speed of the car.

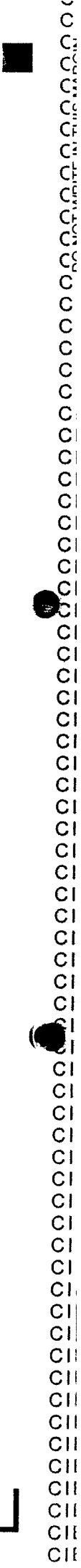
The table shows Jamilah's calculated results.

height in cm	average speed in cm/s
0	0
20	30
40	42
60	52
80	60

Draw a line graph to show her results.



[2]



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