Sc

KEY STAGE 3

TIER 3–6

2008

Science test

Paper 2

First name _____

Last name _____

School _____

Remember

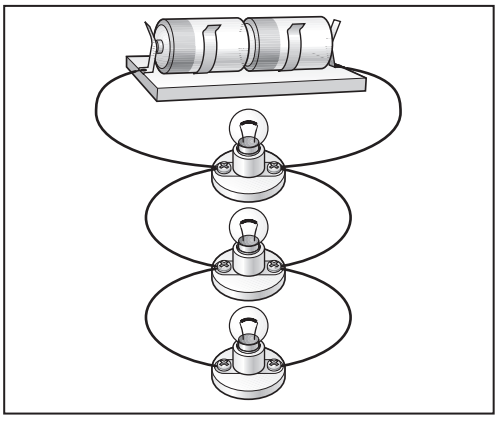
- The test is 1 hour long.
- You will need: pen, pencil, rubber, ruler, protractor and calculator.
- The test starts with easier questions.
- Try to answer all of the questions.
- The number of marks available for each question is given below the mark boxes in the margin. You should not write in this margin.
- If you are asked to plan an investigation, there will be space for you to write down your thoughts and ideas.
- Do not use any rough paper.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

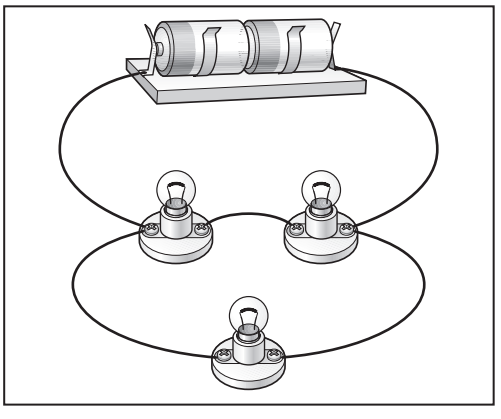
For marker's use only

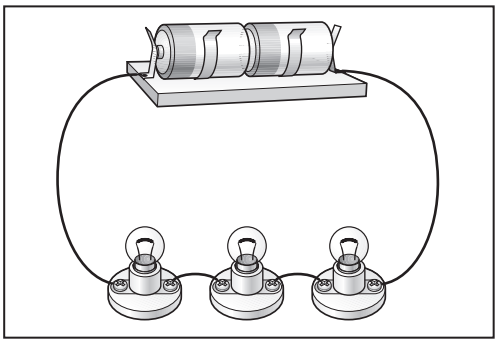
TOTAL MARKS	

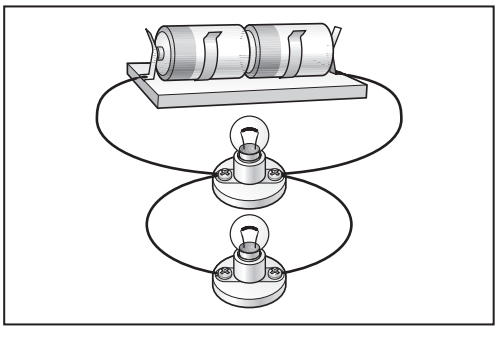
1. (a) Draw a line from each electrical circuit to the correct circuit diagram.
Draw only **four** lines.

electrical circuit

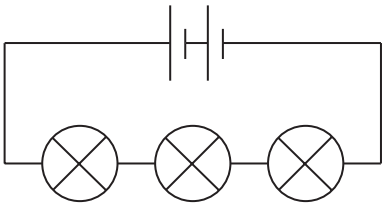


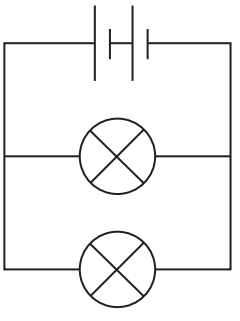


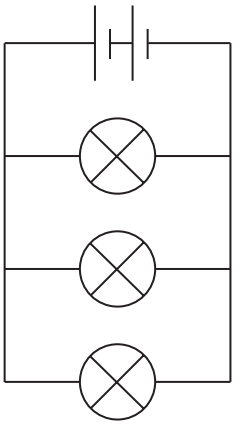


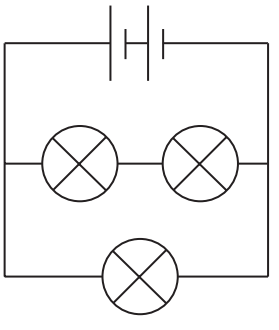


circuit diagram







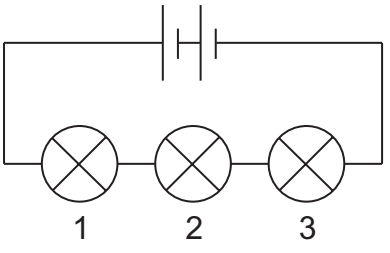


1a
1 mark

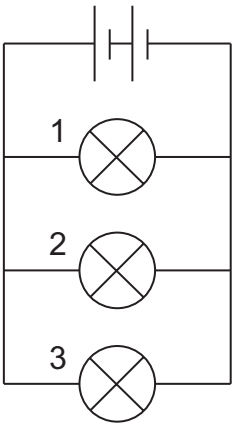
1a
1 mark

(b) In each circuit below, **bulb 1 breaks** and goes off.

Under each circuit diagram below, tick the correct boxes to show if bulb 2 and bulb 3 are **on** or **off**.



circuit A



circuit B

	on	off
bulb 1 breaks		✔
bulb 2		
bulb 3		

	on	off
bulb 1 breaks		✔
bulb 2		
bulb 3		

1b
1 mark

1b
1 mark

(c) Give the name of the part that provides energy for each circuit.

_____

1c
1 mark

(d) Why is copper used for wires in a circuit?
Tick the correct box.

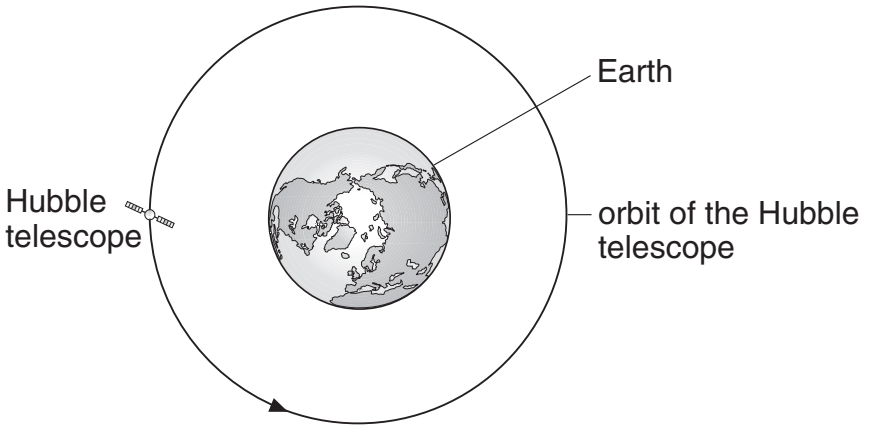
Copper does **not** stick to a magnet.	☐	Copper is a good conductor of electricity.	☐
Copper is a brown metal.	☐	Copper is a good conductor of heat.	☐

1d
1 mark

maximum 6 marks

Total
6

2. The diagram below shows the Hubble telescope in orbit around the Earth.



not to scale

(a) Which force keeps the telescope in orbit around the Earth?
Tick the correct box.

air resistance	☐	friction	☐
gravity	☐	magnetism	☐

☐ 2a
1 mark

(b) The Hubble telescope is a satellite used for looking at planets and stars.

Give **one** other use of satellites.

_____

_____

☐ 2b
1 mark

(c) Fill each of the gaps in the following sentences with a different word from the box below.

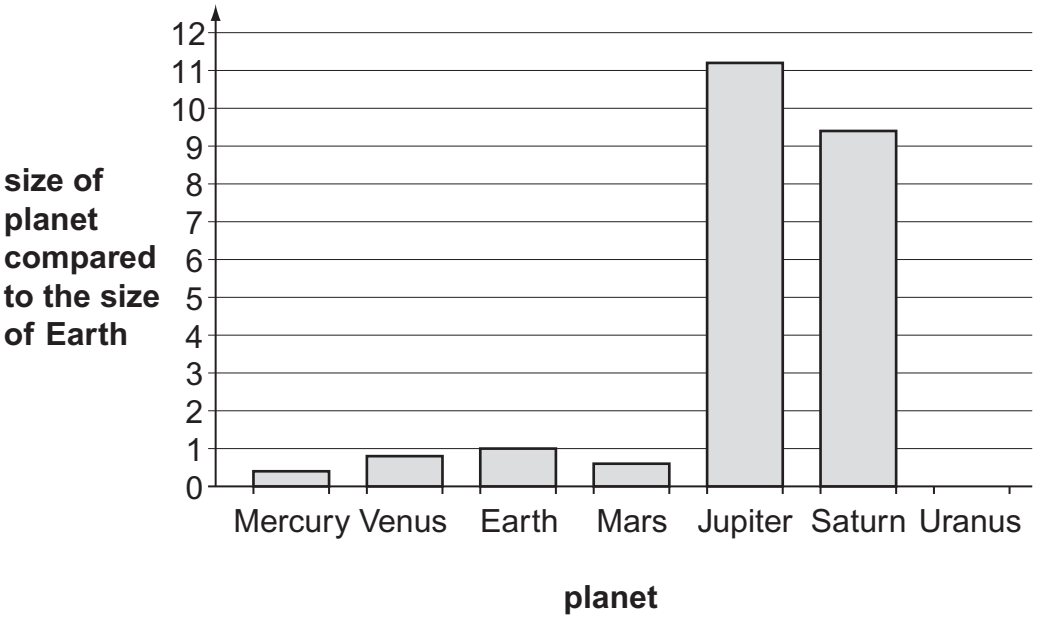
absorbs	**produces**	**reflects**

You can see the Sun because it _____ light.

You can see a satellite because it _____ light.

☐ 2c
1 mark

(d) The bar chart shows the size of five planets compared to the size of Earth.



The planet Uranus is four times the size of Earth.
On the chart above, draw a bar for the planet Uranus.

2d
1 mark

(e) (i) Arrange the following in order of size, starting with the smallest.

Sun	**Hubble telescope**	**Earth**

smallest **largest**

2ei
1 mark

(ii) Some stars are bigger than the Sun but they look smaller.
Why do they look smaller than the Sun?
Tick the correct box.

They are brighter than the Sun.	☐	They are the same colour as the Sun.	☐
They are further away than the Sun.	☐	They are nearer than the Sun.	☐

2eii
1 mark

maximum 6 marks

Total
6

3. Raj put a piece of chalk in one container and a piece of granite in another container.
He shook both containers for two minutes.
The photographs below show what happened.

chalk
before shaking

chalk
after shaking

granite
before shaking

granite
after shaking

(a) (i) Give **two** ways the **chalk** had changed.

1. _____

2. _____

3ai
1 mark

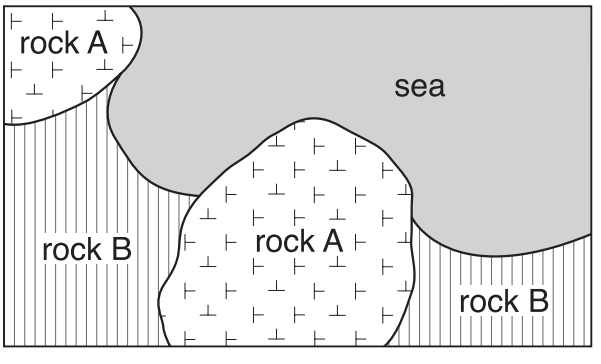
3ai
1 mark

(ii) Suggest why the **granite** did **not** change.

_____

3aii
1 mark

(b) A map of a coastline is drawn below. Waves crash against the rocks.



Which rock is chalk and which rock is granite?
Give the letters from the map.

chalk _____ granite _____

3b
1 mark

(c) The photograph below shows the remains of an animal found in chalk rock.

(i) What are the remains of living things found in rock called?

_____

3ci
1 mark

(ii) Look carefully at the animal remains in the photograph.
Which animal could it be related to?
Tick the correct box.

snail	starfish	ladybird	slug
☐	☐	☐	☐

Give a reason for your answer.

_____

3cii
1 mark

(d) Granite is formed underground from very hot melted rock.

(i) Animal remains are **not** found in granite.
Give the reason for this.

_____

_____

3di
1 mark

(ii) What is hot melted rock called when it is **underground**?
Tick the correct box.

sand	magma	lava	mud
☐	☐	☐	☐

3dii
1 mark

maximum 8 marks

Total
8

4. (a) Draw a line from each change of state to the correct name.
Draw only **four** lines.

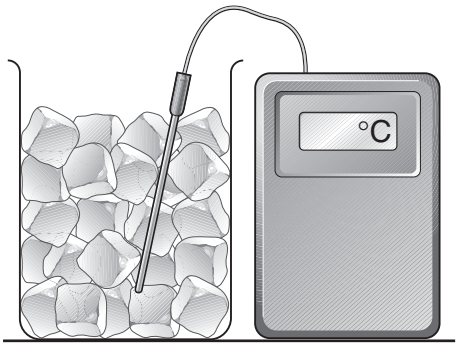
change of state	name
solid to liquid	evaporating
liquid to gas	melting
gas to liquid	condensing
liquid to solid	freezing

4a
1 mark

4a
1 mark

4a
1 mark

(b) Kate made some ice cubes from pure water.
She used a sensor to measure the temperature of the ice.



What temperature will the sensor show when the ice is melting?

_____°C

4b
1 mark

(c) Kate made some more ice cubes from salt solutions. She used a different amount of salt in each ice cube.

The table shows the temperature at which the ice cubes melted.

mass of salt in each ice cube (g)	temperature ice cube melted (°C)
5	– 4
10	– 8
15	–11
20	–15

Look at the table above.
As the mass of salt increased, what happened to the temperature at which the ice cube melted?

_____

4c
1 mark

(d) In very cold weather a mixture of salt and sand is spread on roads.

Why are salt **and** sand used?
Tick the **two** correct boxes.

Salt makes the roads white.	☐	Sand dissolves in water.	☐
Salt makes water freeze.	☐	Sand increases friction between car tyres and the road.	☐
Salt makes ice melt.	☐	Sand makes water freeze.	☐

4d
1 mark

4d
1 mark

maximum 7 marks

Total
7

5. Sharon is riding her horse. She is wearing a riding hat.

(a) Give the name of **one organ** the riding hat protects.

_____

5a

1 mark

(b) The horse is a mammal.
Give **one** fact about horses that shows they are mammals.

_____

5b

1 mark

(c) When the horse is running, some of its organs do more work.

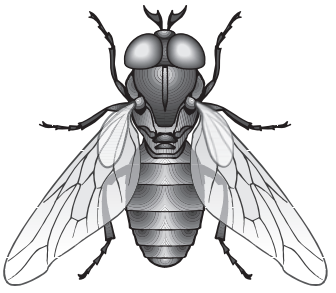
Draw a line from each organ to show what it does.
Draw only **two** lines.

organ	what the organ does
heart	It takes in oxygen faster.
	It moves the bones faster.
	It digests food faster.
lung	It pumps blood faster.

5c

1 mark

(d) The drawing shows a horsefly.



(i) The horsefly is an insect.
Which of the following features do insects have?
Tick the **three** correct boxes.

They have a backbone.	☐	They have a segmented body.	☐
They have six legs.	☐	They have hair.	☐
They have scales.	☐	They have two pairs of wings.	☐

☐ 5di
1 mark

☐ 5di
1 mark

(ii) Female horseflies bite horses and feed on their blood.
Male horseflies feed on plants.

Draw a line from each horsefly below to the word that describes the way it feeds.
Draw only **two** lines.

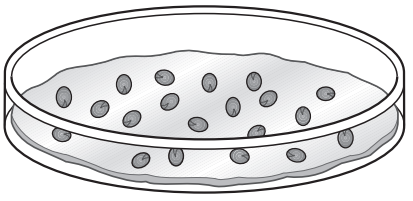
horsefly	**describing word**
	herbivore
female horsefly	
	carnivore
	producer
male horsefly	
	prey

☐ 5dii
1 mark

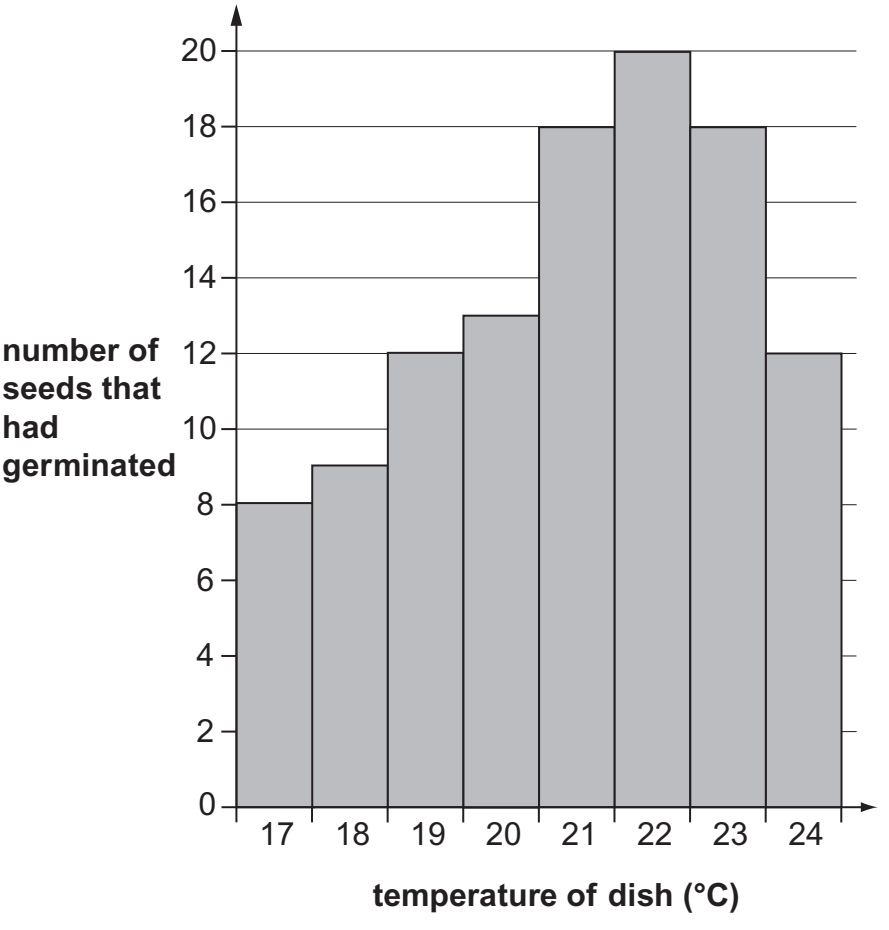
maximum 6 marks

Total
☐
6

6. Abdul put cress seeds on wet filter paper in dishes.
He put 20 seeds in each dish.
Every day he added 5 cm^3 of water to each dish.
He kept each dish at a different temperature.



The bar chart below shows how many seeds had germinated after two days.



Use the bar chart to answer the following questions.

(a) (i) How many different temperatures did Abdul use?

_____

6ai
1 mark

(ii) What was the lowest temperature Abdul used?

_____°C

6aii
1 mark

(iii) How many seeds had germinated at 21°C?

_____

6aiii
1 mark

(iv) Abdul said 23°C was better than 21°C for seeds to germinate.
Was he correct?
Tick the correct box.

yes ☐ no ☐

Use the bar chart to help you give a reason for your choice.

_____

_____

6aiv
1 mark

(v) How does the bar chart show that 22°C is the best temperature for seeds to germinate?

_____

_____

6av
1 mark

(b) Give **one** way Abdul made sure his investigation was a fair test.

_____

6b
1 mark

maximum 6 marks

Total
6

7. The drawing below shows a mole. Moles dig tunnels through soil.

(a) Give **one** way a mole is suited for digging through soil.

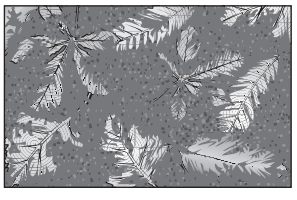
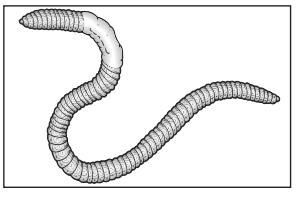
_____

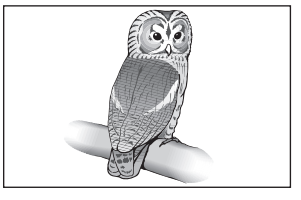
_____

7a

1 mark

(b) Moles are part of the food chain shown below.



plant remains → worm → mole → owl

not to scale

(i) Which living thing in this food chain do moles eat?

_____

7bi

1 mark

(ii) Which living thing in this food chain is a predator of moles?

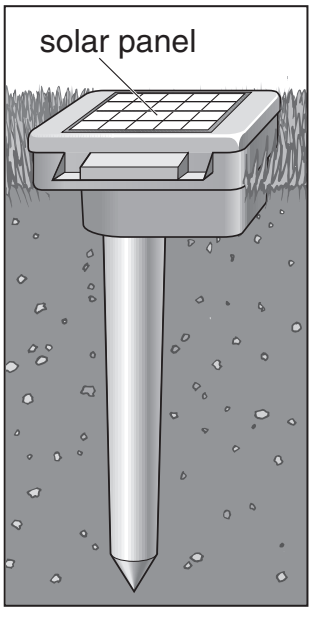
_____

7bii

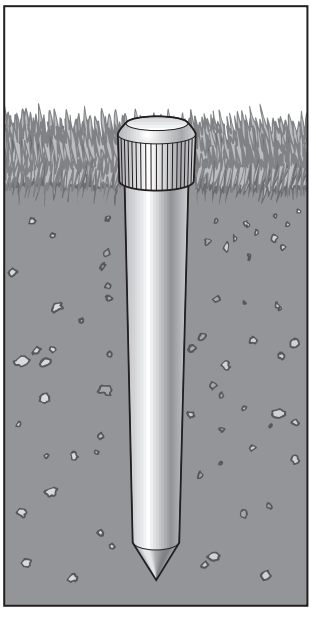
1 mark

(c) Some people use mole-scarers to get rid of moles from their gardens.

Two different mole-scarers are shown below.
They both produce sounds that scare moles away.



solar-powered mole-scarer



battery-powered mole-scarer

(i) Where does the energy come from for the solar-powered mole-scarer?

_____

7ci
1 mark

(ii) Suggest **one** reason for using a solar-powered mole-scarer instead of a battery-powered mole-scarer.

_____

_____

7cii
1 mark

(iii) Some gardeners use poison to kill moles.

Suggest **one** reason for using a mole-scarer rather than poison to get rid of moles.

_____

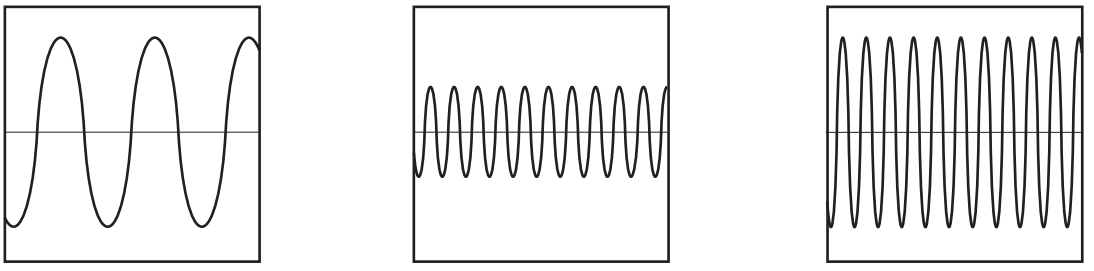
_____

7ciii
1 mark

maximum 6 marks

Total
6

8. (a) The diagrams below show the patterns produced on an oscilloscope by three different sound waves.



A **B** **C**

(i) Which **two** waves have the same loudness?
Write the letters.

_____ and _____

How do the diagrams show this?

_____

_____

8ai

1 mark

(ii) Which **two** waves have the same pitch?
Write the letters.

_____ and _____

How do the diagrams show this?

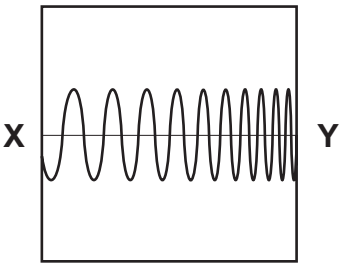
_____

_____

8aii

1 mark

(iii) Shuli is listening to a sound that produces the pattern below.



Describe how the sound that Shuli **hears** changes between X and Y.

_____

8aiii

1 mark

(b) The table below shows the maximum time a person can listen to music at different sound levels without damage to the ear.

sound level (decibels)	maximum time (hours)
86	8
88	4
90	2
92	1
94	0.5

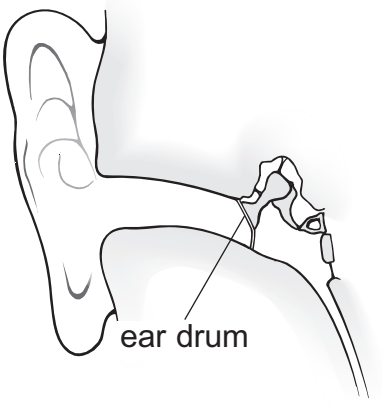
Estimate the maximum time a person could listen to a sound of 87 decibels.

_____ hours

8b

1 mark

(c) The diagram below shows part of the human ear.



What happens to the ear drum as a sound gets louder?

_____

_____

8c

1 mark

maximum 5 marks

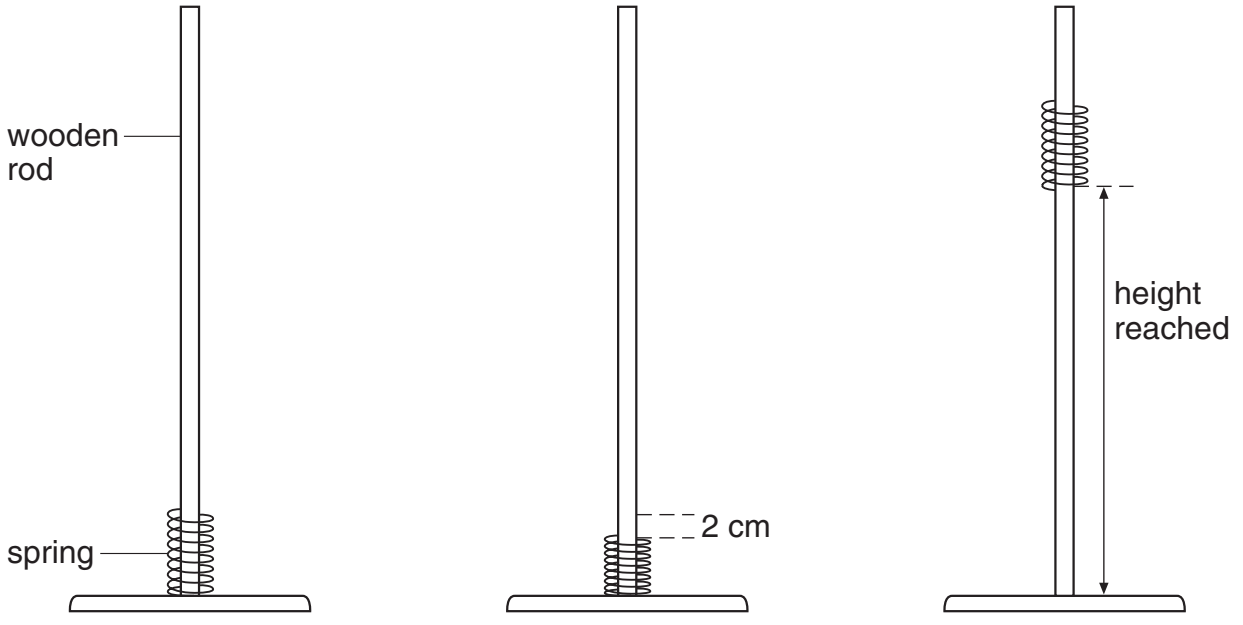
Total

5

9. Jenny put a spring over a wooden rod.

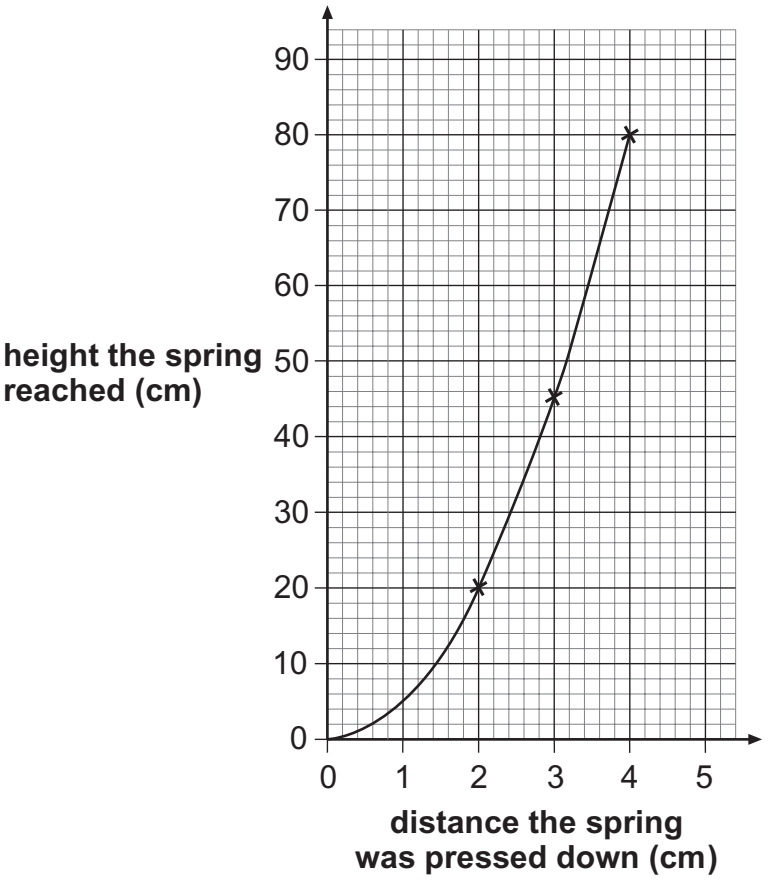
She pressed the spring down 2 cm.

She let go of the spring and measured the height it reached.



not to scale

Jenny repeated her experiment. She pressed the spring down more each time. Her results are shown in the graph below.



(a) Use Jenny's graph to complete the table below.

distance the spring was pressed down (cm)	height the spring reached (cm)
2	
3	
4	

9a
1 mark

(b) Jenny said, 'If I double the distance I press the spring down, the height it reaches will also double'.

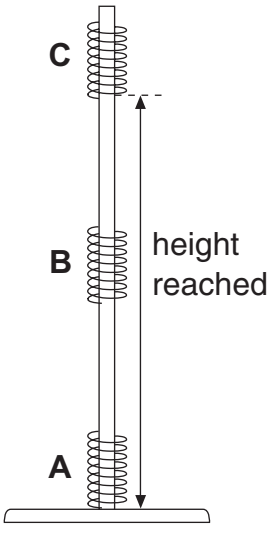
How do the results show she was wrong?

_____

_____

9b
1 mark

(c) This diagram shows the moving spring in three different positions.



Complete the sentences below by choosing words from the box.
You can use each word more than once.

most	some	least

(i) When the spring is moving at **B** it has _____ kinetic energy and _____ gravitational potential energy.

9ci
1 mark

(ii) When the spring reaches **C** it has _____ gravitational potential energy and _____ kinetic energy.

9cii
1 mark

(iii) When the spring stops at **A** it has _____ kinetic energy and _____ gravitational potential energy.

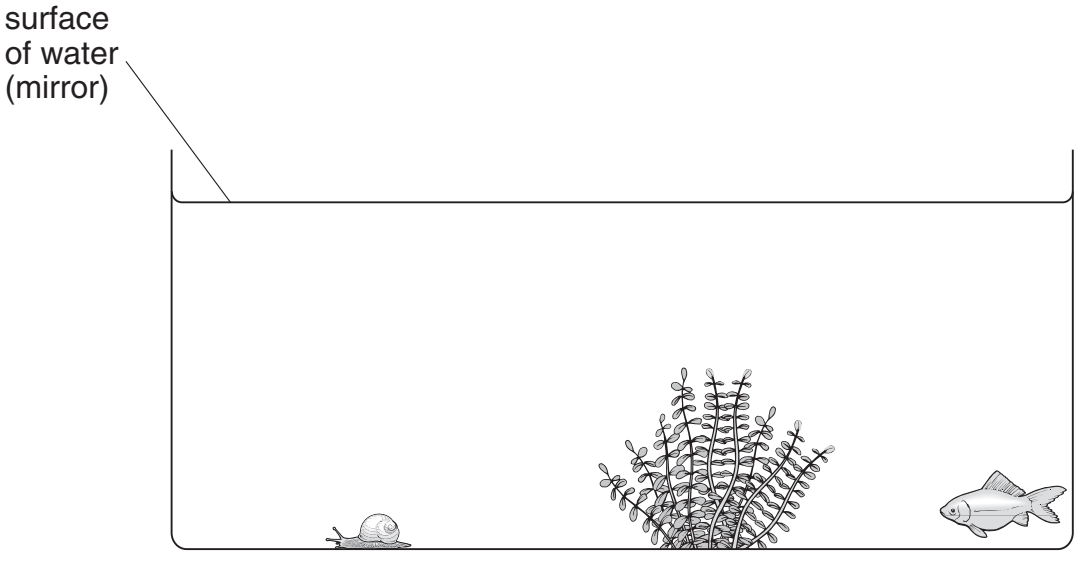
9ciii
1 mark

maximum 5 marks

Total
5

10. (a) The diagram below shows a fish tank.

The surface of the water acts like a mirror.
The fish can see the snail reflected in the surface of the water.



Draw a ray of light which passes from the snail, and reflects from the surface, to show how the fish can see the snail. Use a ruler.

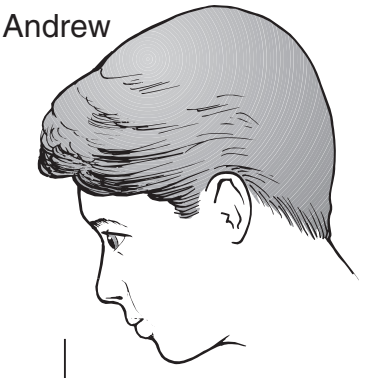
10a
1 mark

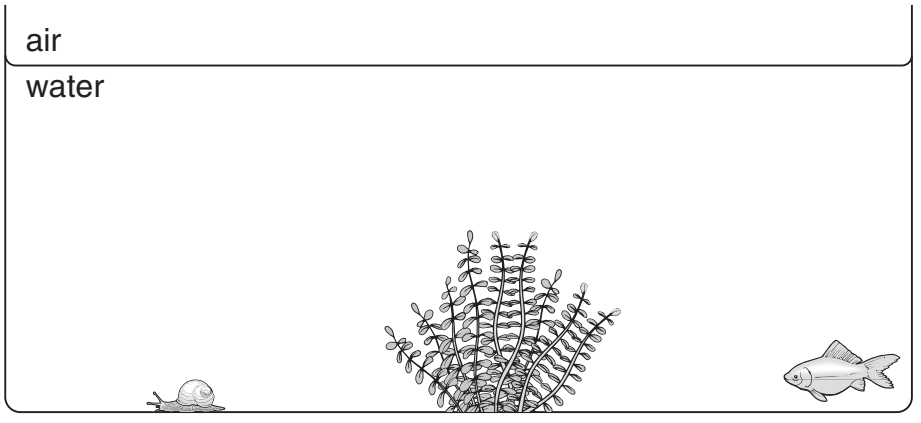
Put arrows on the ray of light.

10a
1 mark

10a
1 mark

(b) Andrew is looking at the snail.





When a ray of light passes from water to air it changes direction.

(i) Draw a ray of light from the snail to Andrew to show how Andrew can see the snail. Use a ruler.

Put arrows on the ray of light.

10bi
1 mark

(ii) What is the name given to this change in the direction of a ray of light?

_____

10bi
1 mark

10bii
1 mark

maximum 6 marks

Total
6

11. Paul had four substances:

citric acid	copper sulphate	indigestion tablet	sugar

He dissolved 1 g of each substance in 20 cm^3 of distilled water.
He used universal indicator to find the pH of each solution.

(a) (i) Sugar solution does **not** change the colour of green universal indicator.

What does this tell you about sugar solution?
Tick the correct box.

It is an acid.	☐	It is an alkali.	☐
It is neutral.	☐	It is sweet.	☐

☐ 11ai
1 mark

(ii) Suggest the pH of citric acid.

_____

☐ 11aii
1 mark

(iii) Indigestion tablets neutralise acid in the stomach.

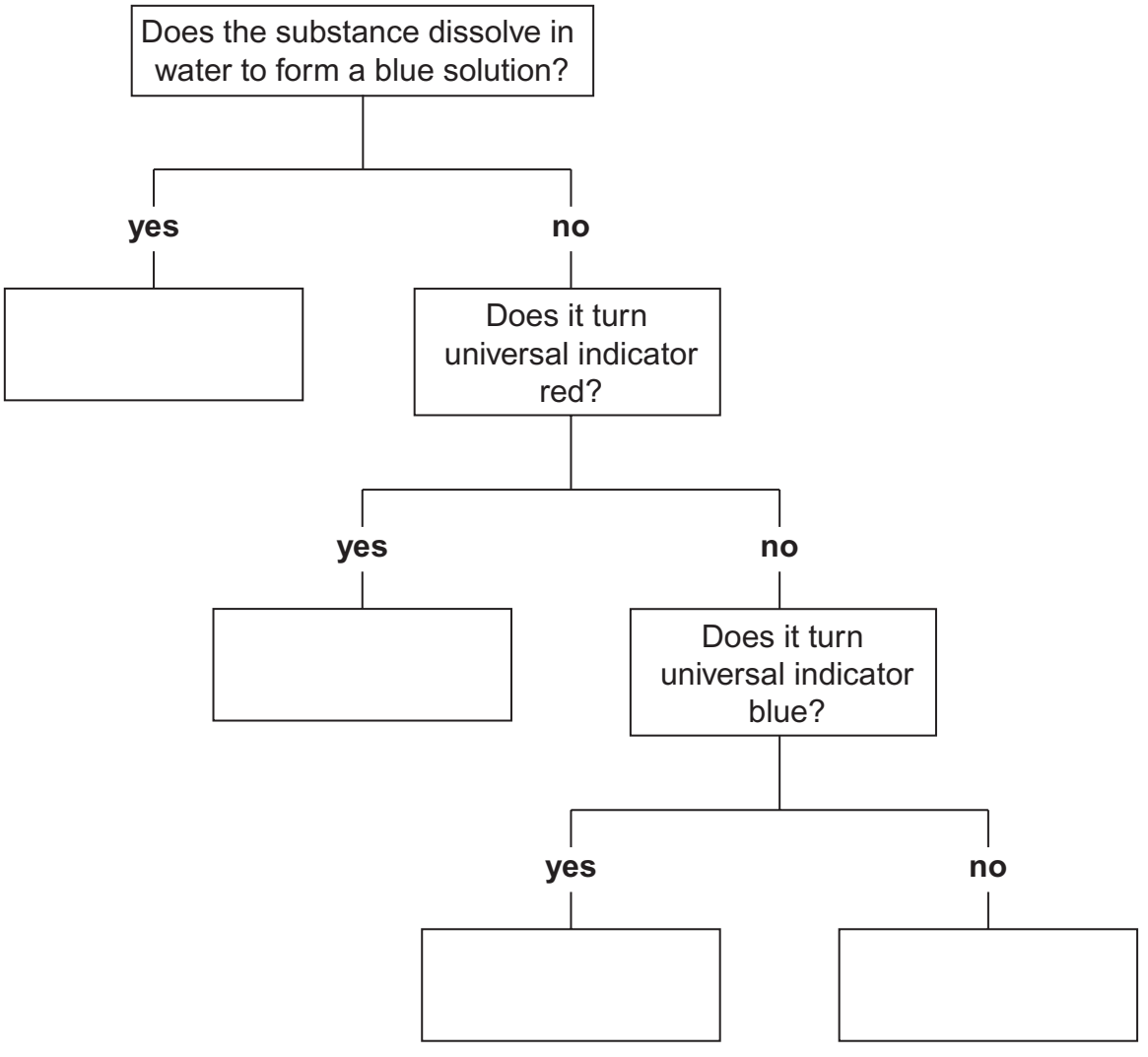
What does this tell you about indigestion tablets?

_____

☐ 11aiii
1 mark

(b) Complete the flow chart below with the names of the substances in the boxes.

citric acid **copper sulphate** **indigestion tablet** **sugar**



11b
1 mark

11b
1 mark

11b
1 mark

maximum 6 marks

Total
6

12. The drawing below shows a gemstone set in a gold ring.

Crystals of gemstones are found in different rocks.

(a) There are three groups of rocks:

igneous	**metamorphic**	**sedimentary**

(i) Crystals can be found in rocks that have been changed into different rocks by high temperature and high pressure.

Which group of rocks is formed in this way?

_____

12ai

1 mark

(ii) Crystals can be found in rocks formed by the cooling of hot magma.

Which group of rocks is formed in this way?

_____

12aii

1 mark

(b) How does the rate at which magma cools affect the size of the crystals formed?

_____

_____

12b

1 mark

(c) Gemstones called rubies are made from an aluminium compound with the formula Al_2O_3.

The chemical symbol for aluminium is Al.

(i) Give the name of the element that is combined with aluminium in this compound.

_____

12ci
1 mark

(ii) Suggest the name of the compound with the formula Al_2O_3.

_____

12cii
1 mark

(iii) How many atoms are there in the formula Al_2O_3?

_____

12ciii
1 mark

(d) (i) The gemstone in the drawing is set into a gold ring.
Gold is an element that is found in rocks.
Gold is never found combined with other elements.

Part of the reactivity series of metals is shown below.

more reactive	aluminium
	zinc
	lead
less reactive	copper

Where should gold be placed in this reactivity series?

_____

12di
1 mark

(ii) The more reactive metals react with acids.

Complete the word equation for the reaction of zinc with hydrochloric acid.

zinc + hydrochloric acid ⟶ _____ + _____

12dii
1 mark

12dii
1 mark

maximum 9 marks

Total
9

13. The table below shows the mass of six nutrients in 100 cm^3 of three types of milk.

nutrient	100 cm^3 of human milk	100 cm^3 of cows' milk	100 cm^3 of milk made from baby-milk powder
carbohydrate (g)	7.4	5.0	7.2
fat (g)	4.2	3.7	3.6
protein (g)	1.1	3.5	1.5
calcium (mg)	35.0	120.0	49.0
iron (mg)	0.075	0.05	0.9
vitamin C (mg)	3.8	1.5	6.9

(a) A scientist compared the three types of milk.

Why was it a fair comparison?

_____

_____

13a

1 mark

(b) Both human milk and milk made from baby-milk powder contain more sugar than cows' milk.

Which data in the table supports this?

_____

13b

1 mark

(c) Why do we need calcium in our diet?

13c

1 mark

(d) (i) Baby-milk powder is made from cows' milk.

What evidence is there in the table that iron is added when making baby-milk powder?

13di

1 mark

(ii) Why do we need iron in our diet?

13dii

1 mark

(e) A pupil said, 'There is more vitamin C than protein in human milk'.

How can you tell from the table that the pupil was wrong?

13e

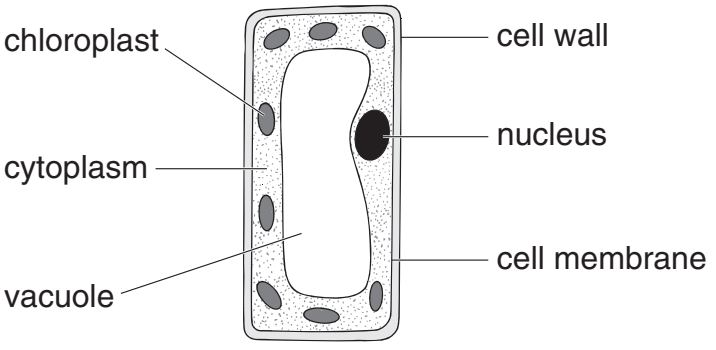
1 mark

maximum 6 marks

Total

6

14. The diagram below shows a plant cell.



(a) In which part of a plant would you find this type of cell?

_____

14a
1 mark

(b) (i) Give the function of the nucleus.

_____

_____

14bi
1 mark

(ii) Give the function of the chloroplasts.

_____

_____

14bii
1 mark

(iii) Give the function of the cell wall.

_____

_____

14biii
1 mark

(c) Give the names of **two** labelled parts that are **not** present in animal cells.

1. _____

2. _____

14c
1 mark

14c
1 mark

(d) Tick **one** box in each row to show whether the statement is true for photosynthesis **or** for respiration.

statement	photosynthesis	respiration
carbon dioxide is produced		
light is needed		
it occurs in plants and animals		
oxygen is produced		

14d
1 mark

14d
1 mark

END OF TEST

maximum 8 marks

Total
8

BLANK PAGE

BLANK PAGE

QCA/08/3300 (Pupil pack)
QCA/08/3298 (Mark scheme pack)
282663