



Remember!

- Each section of questions gets harder as you go through (higher level questions at the end of each section).
- Try **all** questions. Write down an idea even if you're not sure – you might get a mark!
- Answer in pen.
- Use a ruler for drawing lines.

1 hour
79 marks

Year 9

Assessment

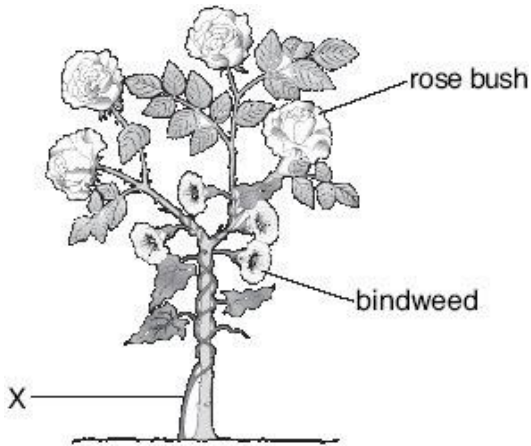
Autumn Term 2 2012

Name _____

Class _____

Science Teacher _____

Q1. Bindweed is a plant that grows tightly around other plants. The drawing below shows bindweed growing around a rose bush.



(a) Complete the sentences below. Choose from the words in the list.

air light support water minerals

(i) Bindweed grows as high as possible on the rose bush so that the bindweed can get as much as possible.

1 mark

(ii) Bindweed grows around the rose bush because the rose bush provides for the bindweed.

1 mark

(b) A gardener cut through the stem of the bindweed at X. Two days later the bindweed above X was dead.

Why did the bindweed die?
Tick the correct box.

no air

no light

no warmth

no water

1 mark

(c) The gardener adds fertiliser to the soil to help her rose bushes to grow well.

What do plants get from the fertiliser?
Tick the correct box.

acids

minerals

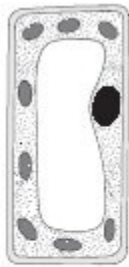
sugars

vitamins

1 mark

(d) Plant roots have root hairs.

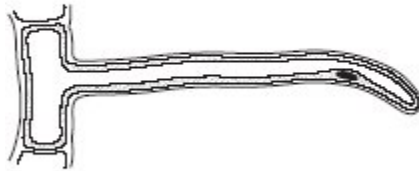
Which diagram shows a root hair?
Tick the correct box.



A



B



C



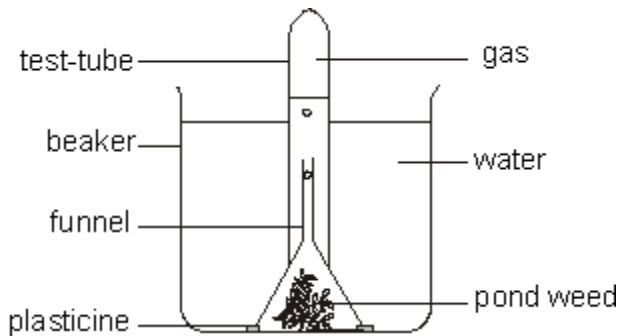
D

not to scale

1 mark
maximum 5 marks

Q2.

The drawing shows an experiment to investigate photosynthesis in weed from a pond.



Bubbles of gas produced during photosynthesis were given off from the pond weed and collected in the test tube.

(a) Name the gas given off in photosynthesis

.....

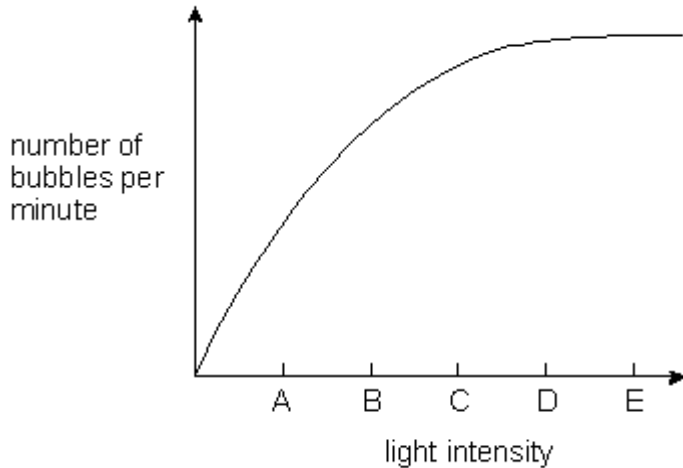
1 mark

(b) What **two** substances are taken in by the plant and used for photosynthesis?

1.
2.

2 marks

Light of different intensities was shone onto the pond weed. The number of gas bubbles given off in one minute at each light intensity was counted. The results are shown in the graph.



(c) Which letter on the horizontal axis shows the light intensity at which the rate of photosynthesis first reaches its maximum?

.....

1 mark

Blue, green and red light were then shone, in turn, onto the pond weed. The number of bubbles of the gas given off in one minute was counted. The results are shown in the table.

| colour of light | number of bubbles in one minute |
|------------------------|--|
| blue | 85 |
| green | 10 |
| red | 68 |

The leaves of the pond weed contain a green pigment which absorbs light for photosynthesis

(d) (i) Name this pigment.

.....

1 mark

(ii) Using the information in the table, tick a box by **one** colour of light which is strongly absorbed by the pigment.

| | |
|-------|--|
| blue | |
| green | |
| red | |

1 mark

(e) Sugar is also produced during photosynthesis.

Give **two** ways in which the plant uses sugar.

1.

2.

2 marks
 Maximum 8 marks

Q3. Joe bought a potted plant. He kept it well watered but some of the leaves turned yellow.



Joe thought that the plant did **not** have enough light for photosynthesis. He moved the plant closer to the window but more leaves turned yellow.

(a) He then thought that the plant did **not** have enough minerals.

The table below gives information about minerals.

| mineral | why the mineral is needed |
|------------|-----------------------------|
| magnesium | to make chlorophyll |
| nitrogen | to make protein |
| phosphorus | to grow and transfer energy |
| potassium | to make fruit |

(i) Joe's plant did **not** have enough of one of the minerals in the table. Use the information in the table to suggest which mineral this was.

.....

1 mark

(ii) A plant growing in a pot is more likely to be affected by a shortage of minerals than a plant growing in a garden.

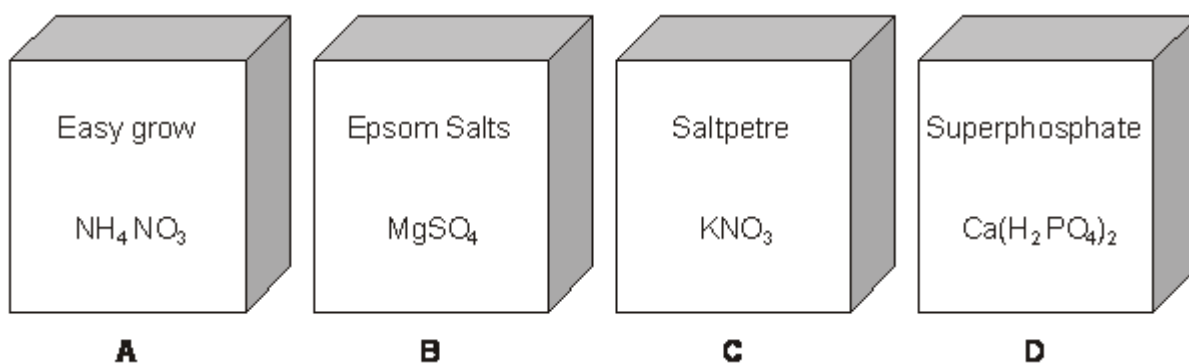
Give the reason for this.

.....

.....

1 mark

(b) Joe bought some fertiliser for his plant. The names and formulae of four different fertilisers are shown below.



(i) Give the letter of **one** box of fertiliser, A, B, C or D, that would provide each of the minerals in the table below. Write the letters in the table.

| mineral | letter of fertiliser |
|------------|----------------------|
| magnesium | |
| nitrogen | |
| phosphorus | |
| potassium | |

3 marks

(ii) Easy Grow is ammonium nitrate, NH_4NO_3 .

How many different elements are present in ammonium nitrate?

.....

1 mark

(iii) How many atoms are present in the formula of ammonium nitrate?

.....

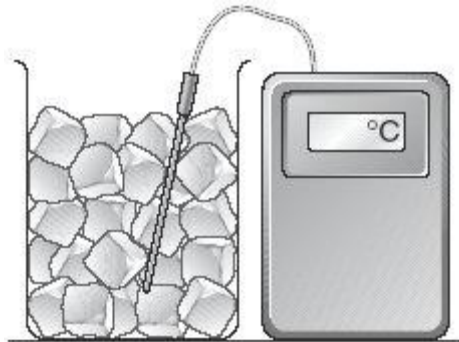
1 mark
maximum 7 marks

Q4. (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 |

3 marks

(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

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?

.....

1 mark

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

Why are salt **and** sand used?

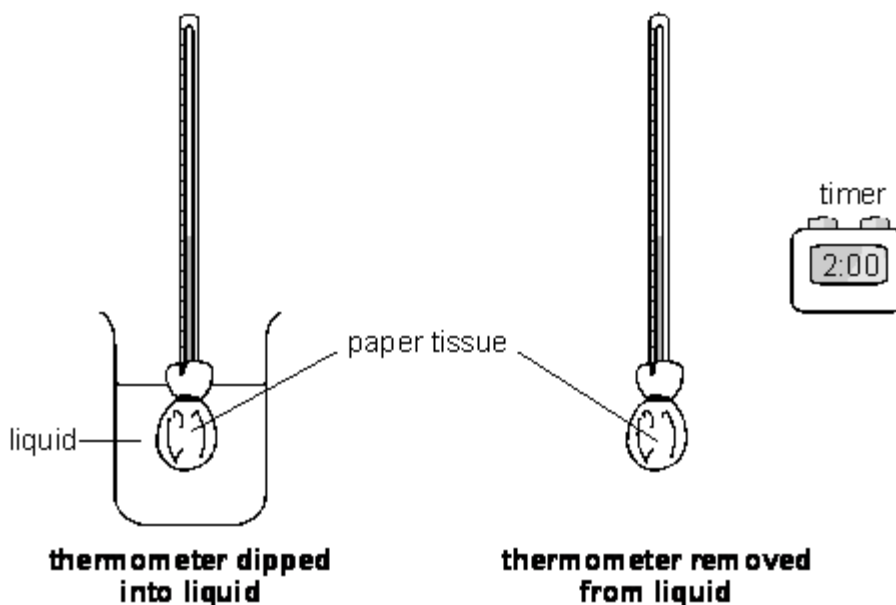
Tick the **two** correct boxes.

- | | | | |
|-----------------------------|--------------------------|---|--------------------------|
| Salt makes the roads white. | <input type="checkbox"/> | Sand dissolves in water. | <input type="checkbox"/> |
| Salt makes water freeze. | <input type="checkbox"/> | Sand increases friction between car tyres and the road. | <input type="checkbox"/> |
| Salt makes ice melt. | <input type="checkbox"/> | Sand makes water freeze. | <input type="checkbox"/> |

2 marks
maximum 7 marks

Q5. A group of pupils carried out an experiment with four different liquids.

They wrapped paper tissues around the bulbs of four thermometers. They secured the tissues with rubber bands. Each thermometer was then dipped into a different liquid and removed. The temperature was recorded. The reading on each thermometer was then noted every two minutes.



The results are given in the table below.

| time in min | reading, in °C, on the thermometer dipped in: | | | |
|-------------|---|---------|-------|-------|
| | propanone | ethanol | ether | water |
| 0 | 23 | 23 | 23 | 23 |
| 2 | 13 | 19 | 11 | 21 |
| 4 | 4 | 16 | -2 | 20 |
| 6 | 2 | 14 | -8 | 20 |
| 8 | 3 | 14 | -1 | 20 |
| 10 | 4 | 14 | 8 | 20 |
| 12 | 6 | 14 | 17 | 20 |

(a) Suggest which liquid evaporated most rapidly.

.....

1 mark

(b) After six minutes, the reading went up on the thermometer dipped in ether. Explain why.

.....

.....

1 mark

(c) What is the likely temperature of the room in which they did the experiment?

.....

1 mark

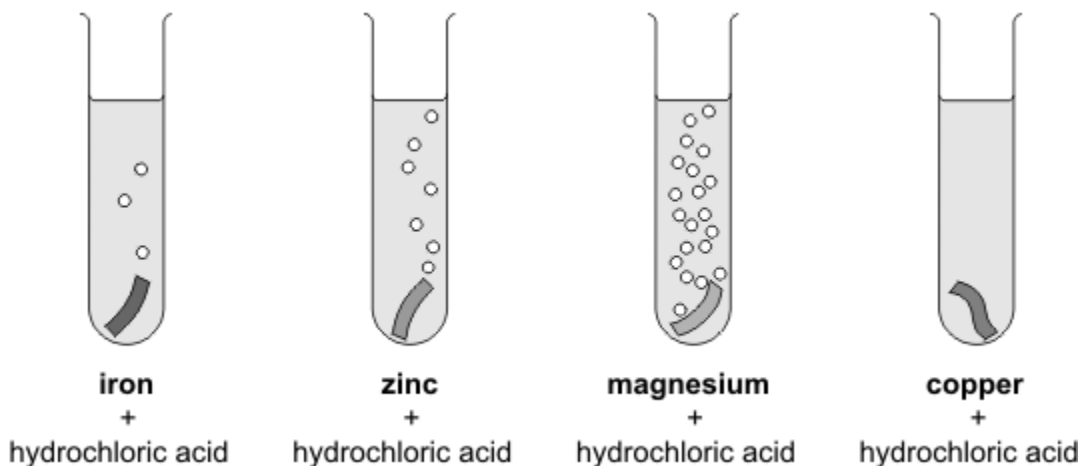
(d) The pupils carried out the experiment with propanone again. However, this time they did **not** wrap the thermometer in paper tissue but just dipped the glass bulb into the propanone and removed it. Suggest how their second set of results would be different.

.....

1 mark
 Maximum 4 marks

Q6. (a) Ruth put a piece of a different metal in each of four test tubes.

She poured 10 cm³ of hydrochloric acid onto each metal.



Look at the diagrams above.

(i) How do these show if a metal reacts with the acid?

.....

1 mark

(ii) **On the lines below**, put the **four** metals in the order of how strongly they react with the acid.

most reactive

.....

.....

least reactive

1 mark

(b) Choose the name of a metal from the box below to answer each question.

copper iron magnesium zinc

(i) Which metal from the box is used for electrical wires?

.....

1 mark

(ii) Which metal from the box goes rusty?

.....

1 mark
maximum 4 marks

Q7. A science teacher showed her class three experiments, A, B and C.
The experiments and the word equations for the reactions that took place are shown below.
All the experiments were done in a fume cupboard.

experiment A

calcium carbonate
calcium carbonate is heated

calcium carbonate

calcium oxide forms in the test tube
carbon dioxide is collected here

word equation calcium carbonate \longrightarrow calcium oxide + carbon dioxide

experiment B

iron filings and sulphur are heated together

word equation iron + sulphur \longrightarrow iron sulphide

experiment C

hot copper is added to chlorine

The diagram shows a test tube labeled 'chlorine' with a piece of 'copper' being added. To the right, a petri dish shows a 'piece of copper covered with brownish solid'.

word equation copper + chlorine → _____

(a) From the substances in experiments A, B and C, above, give the name of:

(i) **one** metallic element;

.....

1 mark

(ii) **one** non-metallic element;

.....

1 mark

(iii) **two** compounds.

..... and

1 mark

(b) In experiment B, the iron filings weighed 2.0 g at the beginning of the experiment and the iron sulphide produced weighed 2.8 g.

Explain this increase in mass.

.....

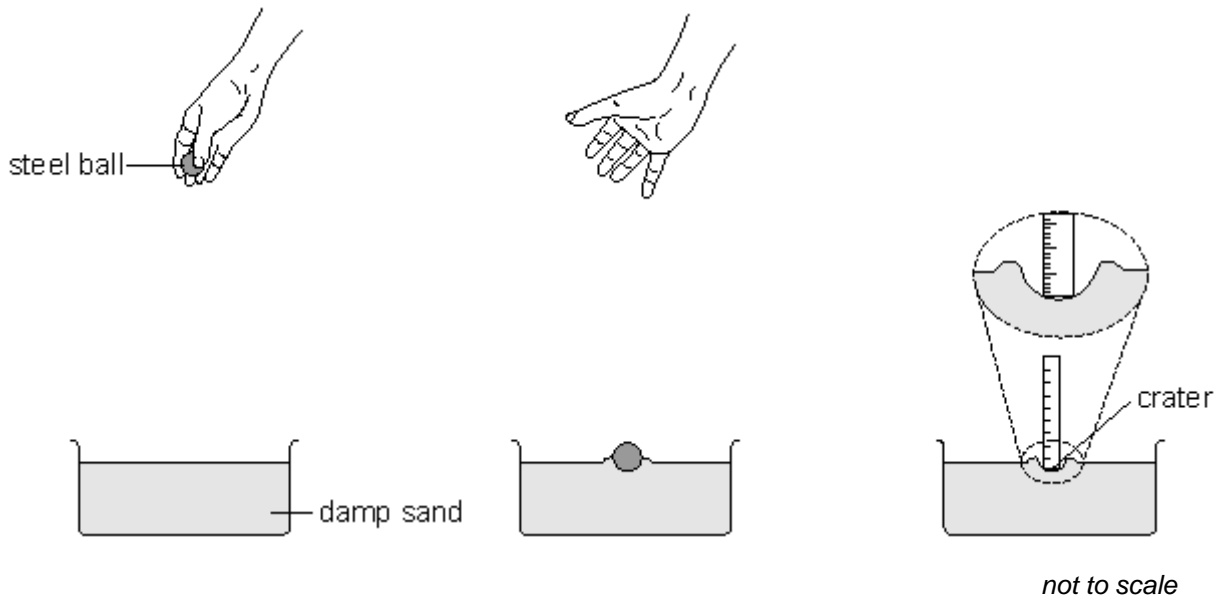
1 mark

(c) Complete the word equation for the chemical reaction in experiment C.

copper + chlorine ?

1 mark
 maximum 5 marks

Q8. Jack and Aneesa dropped a steel ball into trays of damp sand. They measured the depth of the craters made by the steel ball.



Their results are shown in the table below.

| height_ the ball was dropped from (cm) | depth of crater (cm) | | |
|--|----------------------|-----|------------------|
| | Jack's results | | Aneesa's results |
| 10 | 1.1 | 1.2 | 0.8 |
| 20 | 1.4 | 1.5 | 1.4 |
| 30 | 1.6 | 1.6 | 1.5 |
| 40 | 1.8 | 1.7 | 1.8 |
| 50 | 2.0 | 2.1 | 2.1 |

(a) Use information in the table to answer the questions below.

- (i) What was the independent variable that Jack and Aneesa changed in their investigation?

.....

1 mark

- (ii) Why was Jack's investigation better than Aneesa's?

.....

1 mark

- (b) Look at the results in the table.
 What is the relationship between the height_ the ball was dropped from and the depth of the crater?

.....

1 mark

- (c) Aneesa said that they made sure the investigation was fair.

Suggest **two** variables they must have kept the same to make their investigation fair.

1

2

2 marks

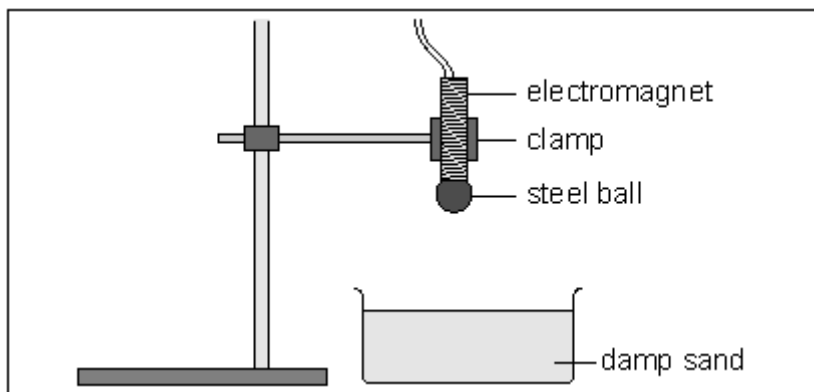
- (d) (i) Jack removed the steel ball using his fingers. Then he measured the depth of the crater.
 Aneesa said he should use a magnet instead of his fingers.

Explain why using a magnet to remove the ball would improve the investigation.

.....

1 mark

- (ii) Jack said that the ball could be dropped using an electromagnet instead of dropping it by hand.



Explain why this would improve the investigation.

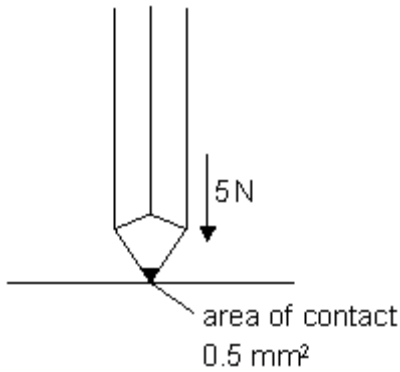
.....

1 mark
 maximum 7 marks

Q9. Jenny is doing her homework.



(a) When Jenny writes, the pencil exerts a force of 5N on the paper.



not to scale

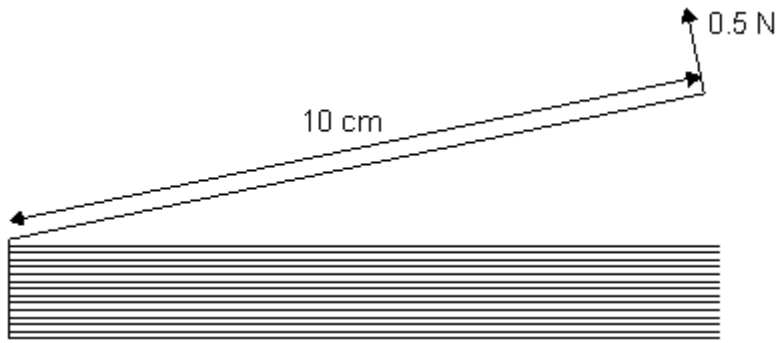
The area of the pencil in contact with the paper is 0.5 mm^2 .

Calculate the pressure of the pencil on the paper.
Give the unit.

.....
.....

2 marks

(b) Jenny puts a book on her desk.
She lifts the cover up with her finger, using a force of 0.5 N.
The cover is 10 cm wide.



Calculate the turning moment on the cover of the book.
Give the unit.

.....
.....

2 marks

- (c) Jenny's book has an area of 200 cm^2 .
It exerts a pressure of 0.05 N/cm^2 on the desk.

What is the weight of the book?
Use the space below to show your working.

_____ N

2 marks
maximum 6 marks

Q10. A gannet is a type of sea bird.



(a) When a gannet flies at a **constant height** above the sea, there is a downward force of 30N on the gannet.

What is the size of the upward force on the gannet?
Tick the correct box.

less than 30N

exactly 30N

more than 30N

need more information

1 mark

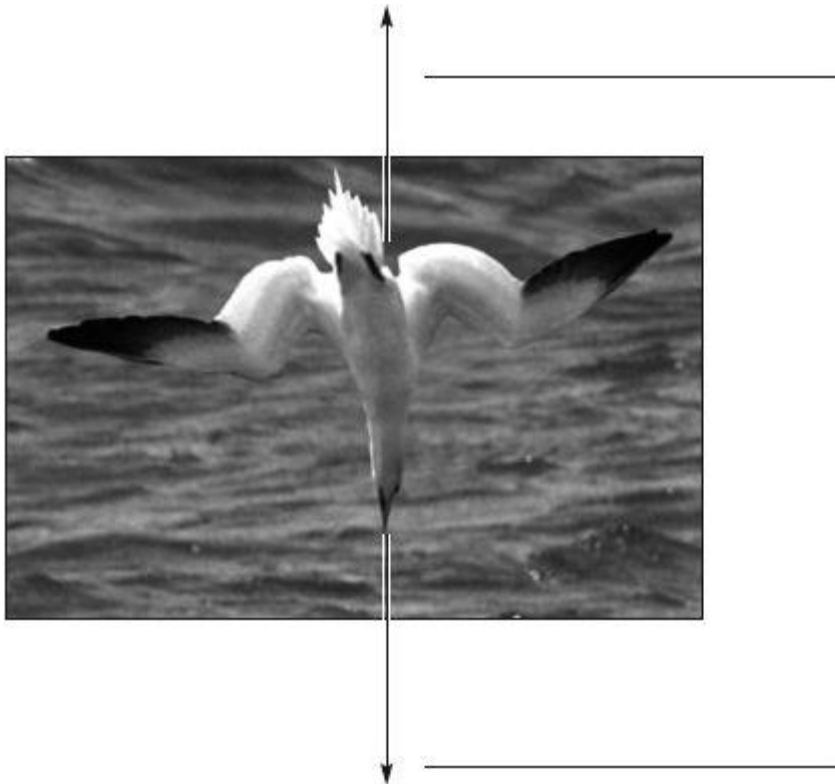
(b) To catch food, the gannet dives down into the sea.
What is the useful energy transfer when the gannet dives?
Choose words from the box below.

thermal gravitational potential sound kinetic light

When the gannet dives, energy is
transferred to energy.

2 marks

(c) Label the arrows to show the **names** of the forces acting on the gannet as it dives.



2 marks

(d) Gannets have pockets of air between their muscles and their skin. Suggest how this is a good adaptation for gannets when they hit the water at fast speeds.

.....
.....

1 mark

(e) The gannet releases energy through respiration. An aeroplane also releases energy when fossil fuels burn.

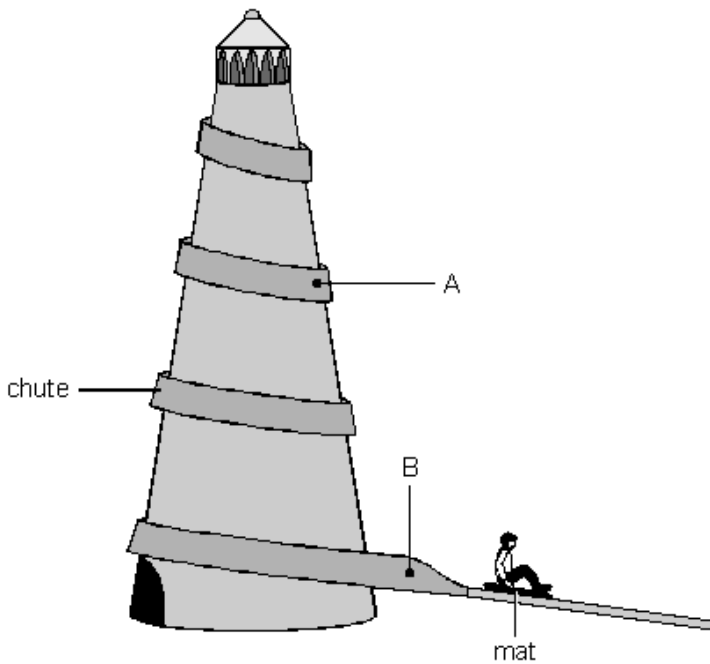
Write **two** other ways that respiration and burning are similar.

1

2

2 marks
maximum 8 marks

Q11 Anil sits on a mat at the top of a helter-skelter and then slides down a chute around the outside.



(a) (i) Name **two** of the forces acting on Anil as he slides from point A to point B.

1.

2.

2 marks

(ii) As Anil slides from point A to point B, the forces acting on him are balanced.

Describe Anil's speed when the forces acting on him are balanced.

.....

1 mark

(b) Anil goes back for a second go. This time he sits on a smooth cushion instead of a mat.

He goes much faster on the cushion. Give the reason for this.

.....

1 mark



(c) On his third go Anil lies back on the cushion with his arms by his side.

What happens to his speed? Give the reason for your answer.

.....



2 marks
 Maximum 6 marks

Q12. David put two bars of iron close to each other.
 There was **no** magnetic force between them.
 David recorded the result as shown below.

| | | | |
|--------------------|---|--------------------------|-------------------------------------|
| bar of iron |  | attract | <input type="checkbox"/> |
| bar of iron |  | repel | <input type="checkbox"/> |
| | | no magnetic force | <input checked="" type="checkbox"/> |



(a) David did three other tests.
 Tick the correct box to show the result for each test.

(i)

| | | | |
|----------------------|---|--------------------------|--------------------------|
| bar of copper |  | attract | <input type="checkbox"/> |
| bar magnet |  | repel | <input type="checkbox"/> |
| | | no magnetic force | <input type="checkbox"/> |



1 mark

(ii)

| | | | |
|--------------------|---|--------------------------|--------------------------|
| bar of iron |  | attract | <input type="checkbox"/> |
| bar magnet |  | repel | <input type="checkbox"/> |
| | | no magnetic force | <input type="checkbox"/> |

1 mark

(iii)

| | | | |
|---------------------|---|-------------------|--------------------------|
| bar of steel |  | attract | <input type="checkbox"/> |
| bar magnet |  | repel | <input type="checkbox"/> |
| | | no magnetic force | <input type="checkbox"/> |



1 mark

(b) David then did two experiments with magnets.

The tick in each box shows David's results in each experiment.



Label the missing poles on **each** magnet to match David's results.

(i)

| | | | |
|-------------------|---|-------------------|-------------------------------------|
| bar magnet |  | attract | <input type="checkbox"/> |
| bar magnet |  | repel | <input checked="" type="checkbox"/> |
| | | no magnetic force | <input type="checkbox"/> |

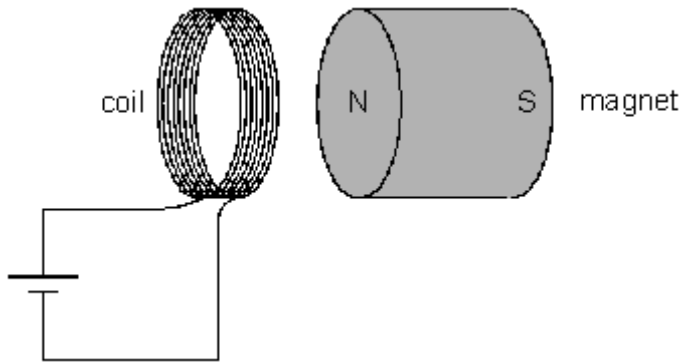
1 mark

(ii)

| | | | |
|-------------------|---|-------------------|-------------------------------------|
| bar magnet |  | attract | <input checked="" type="checkbox"/> |
| bar magnet |  | repel | <input type="checkbox"/> |
| | | no magnetic force | <input type="checkbox"/> |

1 mark
maximum 5 marks

- Q13.** (a) A pupil makes a small coil of copper wire and passes an electric current through it.
The pupil places a small magnet near the coil.



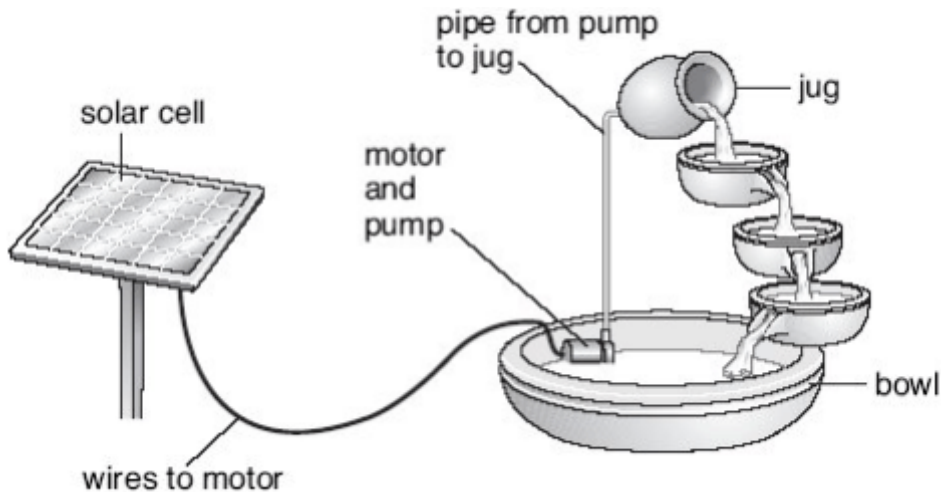
The magnet is attracted towards the coil. The pupil turns the magnet around so that the South pole is nearest the coil.
What effect, if any, will this have?

.....

1 mark

Maximum 1 mark

- Q14.** The drawing below shows a garden water feature. It is solar-powered.



The solar cell absorbs energy from the Sun.
The solar cell is connected to a motor in the bowl.
The motor drives a pump.
Water is pumped up to the jug and it flows back down to the bowl.

- (a) Use the information above to help you to complete the following sentences.
Choose words from the list.

| | | | |
|-----------------|-------------------|--------------------------------|----------------|
| chemical | electrical | gravitational potential | kinetic |
| light | sound | thermal | |

(i) The useful energy change in the solar cell is from light to energy. 1 mark

(ii) The useful energy change in the motor is from electrical energy to energy. 1 mark

(iii) As the water flows from the jug to the bowl energy is changed into energy. 2 marks

- (b) Give **one** advantage and **one** disadvantage of using a solar cell to power the water feature.

advantage
..... 1 mark

disadvantage
..... 1 mark

maximum 6 marks