2016 national curriculum tests

Key stage 2

2016 science sampling tests

Test booklets

Standards & Testing Agency

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2016 national curriculum tests

Key stage 2

Science sampling

Booklet 2B

First name						
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School name						

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Please do not write on this page.

Instructions

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Questions and answers

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Marks

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1 Duck pond

a Peter goes to the duck pond with his grandad and his dog.

Tick **TWO** boxes to show two things that are true about a **dog** and a **duck**.

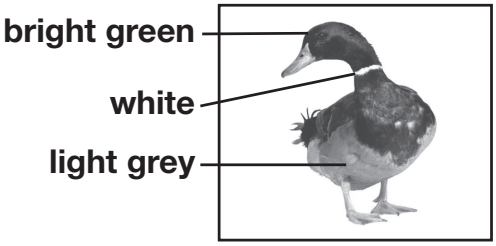
They both have fur.	☐	They both move.	☐
They both lay eggs.	☐	They both breathe.	☐

a1 a2 a3 a4

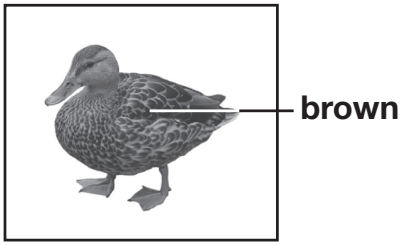
1 mark

S000362_01

b Two of the ducks come out of the pond.



Male duck



Female duck

(i) Describe how a duck's feet are adapted for swimming.

_____

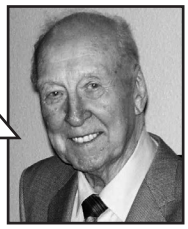
bi

1 mark

S000362_02

Why do the two ducks look different?

The female needs to stay hidden when she sits in her nest.



(ii) Why would the female duck be hard to see in a nest?

_____

bii

1 mark

S000362_03

(iii) Explain why the female duck needs to stay hidden when she is in her nest.

_____

biii

1 mark

S000362_04

c Peter sees some piles of soil on the grass near the pond.

Grandad tells him that the piles of soil are made by animals called moles.

Look at the picture of a mole.

(i) Describe how a feature of the mole helps the mole to live underground.

Feature: _____

How it helps: _____

ci

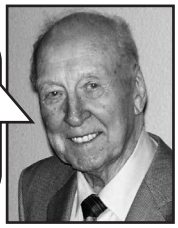
1 mark

S000362_05

(ii)

Why do moles live in soil?

To find earthworms to eat, and to hide in the soil.



Which word **cannot** be used to describe a mole?
Tick **ONE** box.

prey	producer	predator	consumer
☐	☐	☐	☐

cii

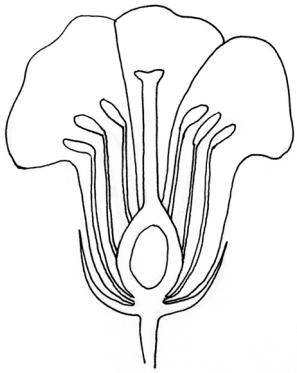
1 mark

S000362_06

2 Seed dispersal

a The diagram shows a flower cut in half.

Put a **cross (X)** on the diagram to show where the seed develops.



a

1 mark

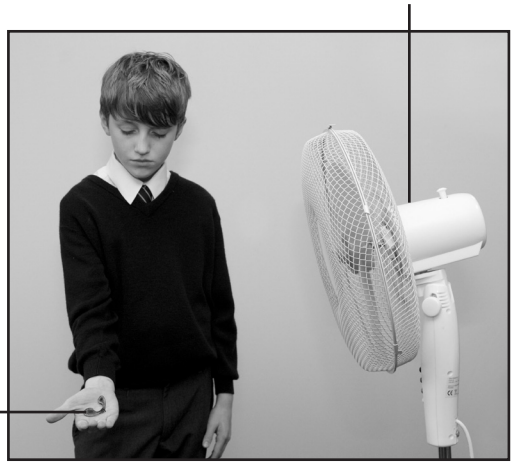
S000273_01

b Class 6 have collected different types of seed.

They blow the seeds with a fan.

This disperses the seeds.

They measure how far each seed travels.



What equipment can measure how far the seeds travel?

_____

b

1 mark

S000273_02

c The seeds can be blown by the children's mouths or with a fan.

Explain why the fan helps to make the test fair.

_____

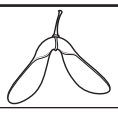
_____

c

1 mark

S000273_03

d Here is a table of the children's results using a fan.

Plant	sycamore	apple	bulrush	oak
Seed				
Distance travelled (cm)	76	27	149	0

The sycamore seed and bulrush seed travel the furthest distances.

They fall slowly from the plant so the wind has more time to blow them away.

Tick **ONE** box to show which features of the seeds help them to fall slowly.

- They are smooth and soft. ☐
- They have a large area and are heavy. ☐
- They have a large area and are light. ☐
- They are flexible and soft. ☐

d

1 mark

S000273_04

e Name the force that **slows** the seeds as they fall.

_____

e

1 mark

S000273_05

f The children dispersed the seeds with a fan.
The fan disperses seeds like the wind does in nature.

Name **ONE** other way seeds are dispersed in nature.

_____

f

1 mark

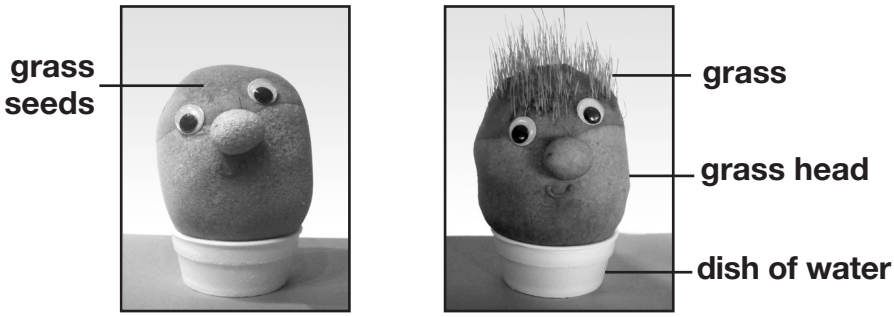
S000273_06

3 Grass heads

a Class 6 are investigating how grass grows.

They grow grass on grass heads filled with sand.

They keep their grass heads standing in dishes of water so they do not dry out.



Before **After one week**

All plants need water to grow.

Name **TWO** other things that all plants need to grow.

_____ and _____

a1 a2

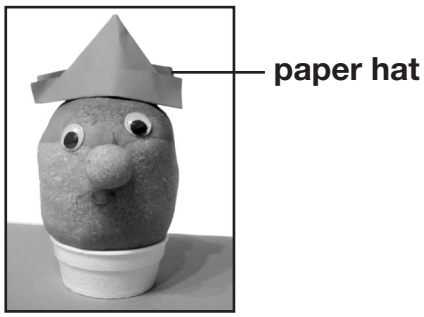
1 mark

S000226_01

b Some children give their grass head a hat.

They keep all other conditions the same.

The children **predict** that when the grass under the hat grows, it will look more yellow than the grass not covered by the hat.



Give **ONE** reason why the grass under the hat might look more yellow.

_____

b

1 mark

S000226_02

c Class 6 use a ruler to measure the height of the grass every week.

The grass grows to different heights so it is difficult to know which piece of grass to measure.

Write **yes** or **no** next to each idea to show if it is a good way for class 6 to measure the height of the grass each week.

Class 6 could measure the height of the grass by...	**Yes** or **no**?
finding an average length of several pieces of grass.	
measuring the length of a different piece of grass each week.	

c1

c2

1 mark

S000226_03

d Some other children put their grass head in a sealed, dry plastic bag.

They keep all other conditions the same.

They observe that droplets of water form on the inside of the bag.

plastic bag

Tick **ONE** box to explain why droplets of water form on the inside of the plastic bag.

Water…

- condenses from the grass head and evaporates on the bag. ☐
- dissolves from the grass head and evaporates on the bag. ☐
- evaporates from the grass head and condenses on the bag. ☐
- dissolves from the grass head and condenses on the bag. ☐

d

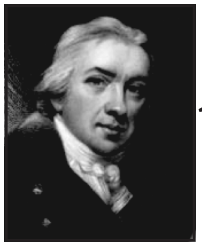
1 mark

S000226_04

4 Smallpox

a Smallpox and cowpox are diseases. People who catch smallpox can die.

Dr Jenner discovered how to stop people catching smallpox.



I think that people who have had cowpox will not catch smallpox.

Dr Jenner (1749 – 1823)

(i) What sort of statement did Dr Jenner make? Tick **ONE** box.

explanation	prediction	comparison	observation
☐	☐	☐	☐

ai

1 mark

S000360_01

(ii) Dr Jenner did a test to find out if his statement was true.

He infected a boy called James with cowpox.

James got better.

Describe what Dr Jenner must have done next **and** also describe the evidence needed to show that his statement was true.

_____

_____

aii

2 marks

S000360_02

(iii) Dr Jenner tested other people.

Why did Dr Jenner test other people?

_____

aiii

1 mark

S000360_03

b Not everyone had Dr Jenner's treatment.

In 1844 many people died from smallpox.

The table shows how many people died from smallpox at different ages in London.

Age (years)	Number of people who died from smallpox
10	226
20	240
30	98
40	43
50	13
60	19
70	10
80	10

How many people who were 30 years old died from smallpox?

_____

b

1 mark

S000360_04

c Holly looks at the information in the table.

Holly

The younger the person the more likely they were to die of smallpox.

Explain why Holly cannot be sure of her conclusion.

_____

_____

c

1 mark

S000360_05

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2016 national curriculum tests

Key stage 2

Science sampling

Booklet 5B

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Middle name						
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Date of birth	Day		Month		Year	
School name						

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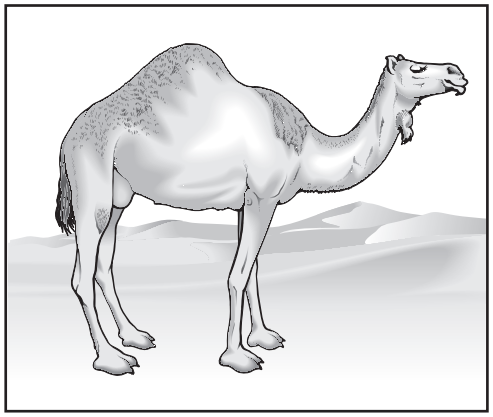
1 Camels

a Camels can live in hot places.



Some features of a camel's body help it to survive in a hot desert.

Match each feature below to show how it helps the camel survive in the desert.

One has been done for you.

Camel's features	How feature helps	
long legs	keep the camel's body further from the hot sand	a1
wide feet	protect camels when eating prickly plants	a2
thick fur	help camels stay on top of the sand	
long eyelashes	protect camels against sand blowing in the air	a3
thick, leathery lips	protects camels from getting sunburnt	a4

2 marks

S000211_01

2 Tree

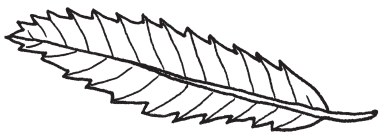
a Ella is looking at some leaves.

The key below identifies which tree each leaf comes from.

Key to tree leaves:

① Is the leaf long and thin? →	Yes: GO TO ② No: GO TO ③
② Is the edge of the leaf smooth? →	Yes: **Laurel** No: **Sweet chestnut**
③ Is the edge of the leaf smooth? →	Yes: **Lilac** No: **Silver birch**

Look at this picture of a leaf from one of the trees.



(i) Use the key above to identify the tree it comes from.

The leaf is from a _____ tree.

ai

1 mark

S000330_01

(ii) Tick **ONE** box to show why it is useful to identify plants and put them into groups.

so we know where to find a plant	☐	because there is a large variety of plants	☐
in case the plants become extinct	☐	so we can observe the plants in their habitats	☐

aii

1 mark

S000330_02

b Complete the sentences below to show the function of the leaves and roots.

(i) The tree uses its leaves to _____.

(ii) The tree has roots to _____.

bi

1 mark
S000330_03

bii

1 mark
S000330_04

c Ella finds a seed.

Why does the tree need to produce seeds?

_____

c

1 mark
S000330_05

d Squirrels live in trees.

Give **ONE** feature of the **squirrel** from the picture.
Describe how this feature helps the squirrel to live in a tree.

Feature of the squirrel that helps it live in a tree: _____

How the feature helps: _____

_____

d

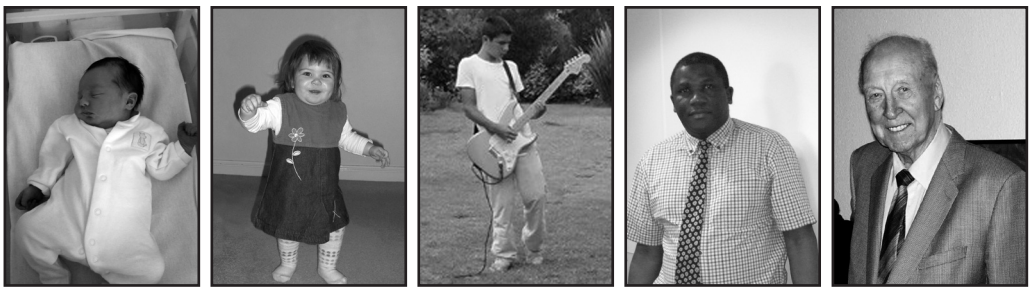
1 mark
S000330_06

3 Human life cycle and pulse rate

a Ella is learning about the human life cycle.

She collects pictures of people of different ages.

Label the photographs to name stages **B** and **D** in the human life cycle.



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

baby _____ **teenage** _____ **old age**

a1

a2

1 mark

S000279_01

b Ella wonders if pulse rate is affected by the different stages in the human life cycle.

Complete the sentence below about pulse rate.

Pulse rate measures how quickly the _____ pumps blood around the body.

b

1 mark

S000279_02

c Ella measures the resting pulse rate of people from each of the life stages.

Ella's test would not be fair if she measured some people's pulse rates after they were exercising instead of after resting.
Explain why.

_____

_____

c

1 mark

S000279_03

d The table shows Ella's results.

Stage of the human life cycle	Average resting pulse rate (beats per min)
A (baby)	135
B	97
C	84
D	72
E (old age)	76

Ella concludes, 'The older you are, the slower your resting pulse rate is.'

The evidence in Ella's results does **not** support her conclusion.

Use Ella's results to explain why they do **not** support her conclusion.

_____

_____

d

1 mark

S000279_04

e People who are fit have lower resting pulse rates than people who are unfit.

Write **yes** or **no** on each row of the table to show if the activities are likely to affect a person's resting pulse rate.

Activity	Will the activity affect a person's resting pulse rate? **Yes** or **no**?
swim every day	
go for a walk every day	
read every day	

e1

e2

e3

1 mark

S000279_05

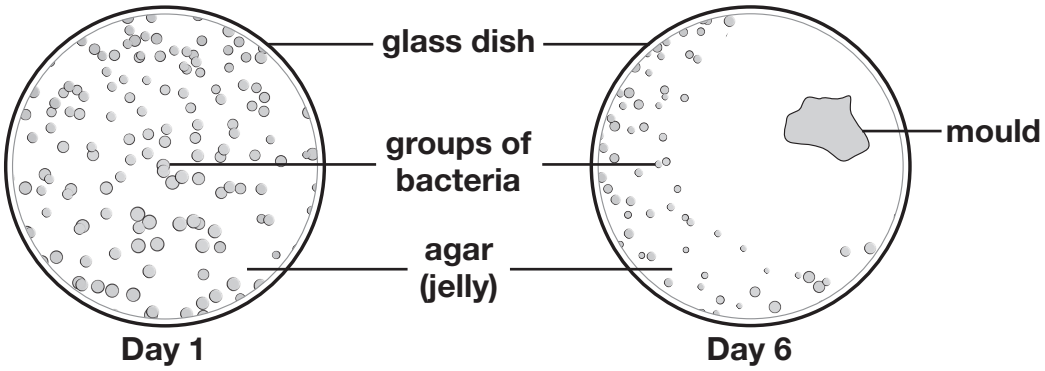
4 Penicillin

a

In 1928 a scientist called Alexander Fleming grew micro-organisms called bacteria. Growth shows that bacteria are living things.

The bacteria grew on agar (jelly) in glass dishes.

After a few days Fleming saw mould growing in one of the glass dishes.



(i) Sort the five things in the box below into **living** and **non-living** things. One has been done for you.

bacteria	glass dish	mould	agar (jelly)	human

Living things	Non-living things
bacteria	

ai1 ai2 ai3 ai4

1 mark

S000204_01

(ii) Growing is a life process.

Name **ONE** other life process.

_____

aii

1 mark

S000204_02

b Bacteria can cause disease.

Fleming thought he could use the mould to help cure disease caused by bacteria.

Look at the pictures opposite for **Day 1** and **Day 6**.

Use the evidence in the pictures opposite to explain why Fleming thought the mould could be used to cure disease.

_____

_____

b

1 mark

S000204_03

c Fleming used the mould to make a medicine called penicillin.

It took over 10 years for penicillin to be first used by doctors.

Write **true** or **false** next to each statement to show why it took a long time for penicillin to be used as a medicine.

	True or **false**?	
The medicine had to be tested to make sure it was safe.	_____	c1
Scientists had to find a way of making lots of penicillin at a time.	_____	c2
It took 10 years for the mould to start growing.	_____	c3
Fleming needed to check that his ideas were correct.	_____	c4

2 marks

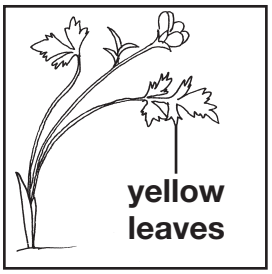
S000204_04

5 Plants on the school field

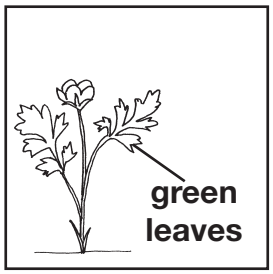
a

Some children are finding out about plants. They get three buttercup plants. They put each plant in a place with different conditions.

After two weeks, the buttercup plants look like this:



Place A



Place B

Place C

Write **A**, **B**, and **C** in the table below to match each place to the conditions found there.

Place	Conditions	
	Does the plant have light?	Does the plant have water?
	✓	✓
	✓	✗
	✗	✓

a1 a2 a3

1 mark

S000289_01

b

There are differences between plants.
These differences help people sort plants into groups.

Write **true** or **false** next to each reason that explains why plants need to be sorted into groups.

Plants need to be sorted into groups...	**True** or **false**?
to stop plants becoming extinct.	_____
to help people identify plants.	_____
to help plants reproduce.	_____

b1 b2 b3

1 mark

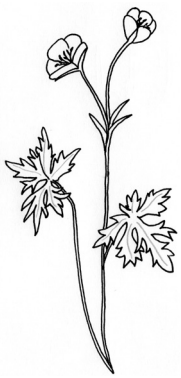
S000289_02

c

The children look at different plants on the school field.

They record the number of common plantain and buttercup plants in $1m^2$ in different places.

Common plantain



Buttercup

The children think they see a pattern in the place that the plants grow.

The table shows their results.

How many children are playing in each place?	Number of plants (in $1m^2$)	
	common plantains	buttercups
lots	12	0
some	4	3
few	1	9

Describe the relationship between **how many children** are playing in a place and the **number of common plantains** found there.

_____

_____

c

1 mark

S000289_03

d

The buttercup plant has a long thin stem.

The long thin stem of the buttercup plant stops it surviving in places where lots of children play. Explain why.

_____

_____

d

1 mark

S000289_04

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Key stage 2

Science sampling

Booklet 8C

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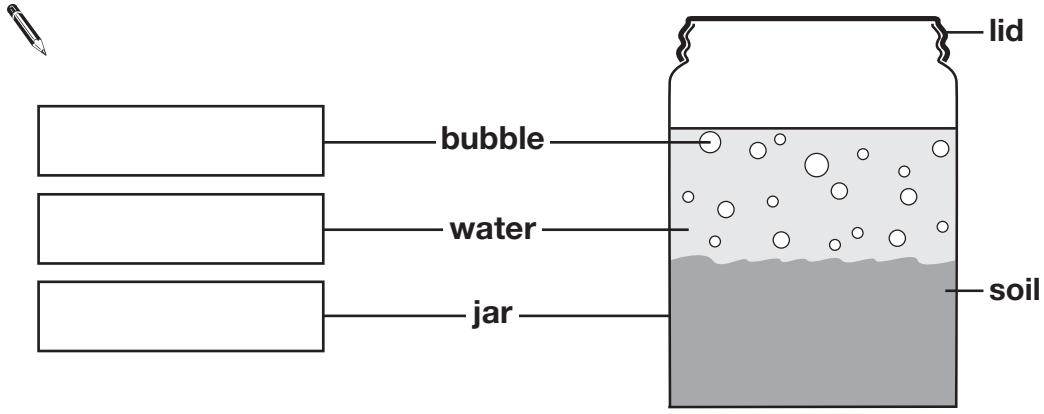
1 Soil

a Tom puts some soil and water in a jar with a lid.

He sees bubbles rising to the surface.

Complete the labels. Write **solid**, **liquid** or **gas** in each box.



a1
a2
a3

1 mark
S000309_01

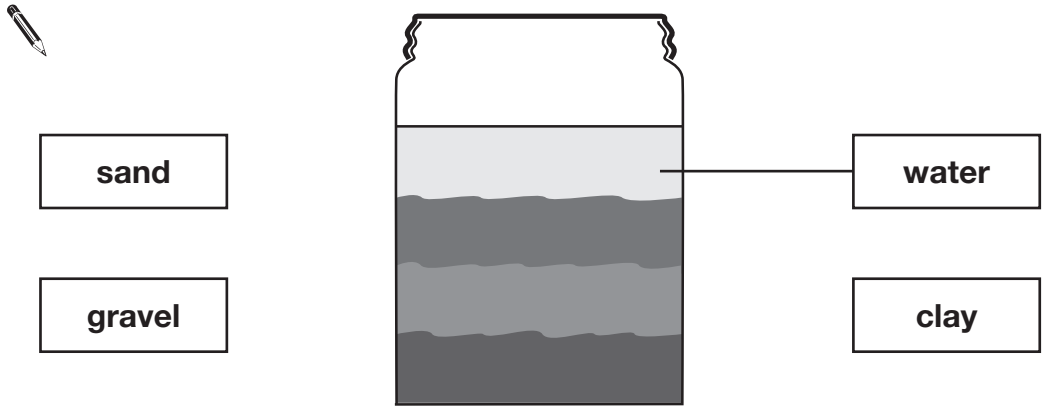
b Tom shakes the jar and then leaves it to stand.

After a day, the soil in the jar has separated into layers: sand, gravel and clay.

The gravel particles are the heaviest.

The clay particles are the lightest.

Draw **THREE** lines to match each label to the correct layer in the jar. One has been done for you.



b1
b2
b3

1 mark
S000309_02

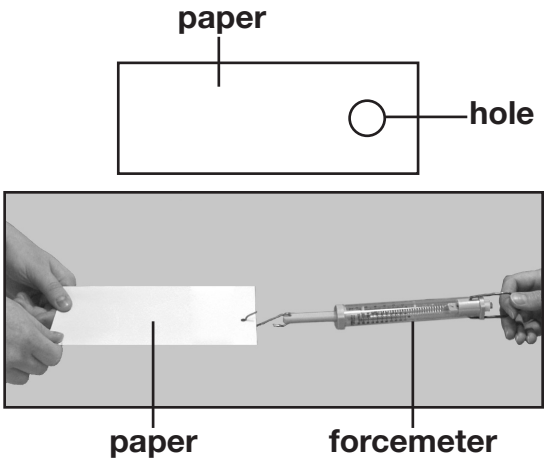
2 Tearing paper

a Alice and Karim want to find out which type of paper tears most easily.

Look at their plan.

Plan

1. Make a small hole 1 cm from the edge of the paper.
2. Attach a forcemeter to the piece of paper.
3. Pull the forcemeter.
4. Measure the size of the pull needed to tear the paper.
5. Repeat with different pieces of paper.



Alice and Karim put their results in a table.

Complete the table by writing the headings of the columns.

_____	_____ (newtons)
paper tissue	2
tracing paper	5
newspaper	4
paper towel	3

a1

1 mark

S000251_01

a2

1 mark

S000251_02

b Tick **ONE** box to show which paper was most difficult to tear.

paper tissue ☐ tracing paper ☐

newspaper ☐ paper towel ☐

b

1 mark

S000251_03

c Alice and Karim want to make sure their results are reliable.

Tick **ONE** box to show how the children can make sure their results are more reliable.

- Use the same size of each paper. ☐
- Test more than four types of paper. ☐
- Test each type of paper three times. ☐
- Draw a graph of their results. ☐

c

1 mark

S000251_04

d Alice says, 'It took 4 newtons to tear the newspaper.'

I wonder what will happen if I make changes to the newspaper.

Complete the table below to show how the changes to the newspaper will affect how easy or hard it is to tear.
Tick **ONE** box in each row.

Change to newspaper	The newspaper will be...		
	easier to tear.	**harder to tear.**	**the same to tear.**
use two sheets of newspaper (one on top of the other)			
use a wet piece of newspaper			
use a longer piece of newspaper			

d1

d2

d3

1 mark

S000251_05

3 Separating sand and salt

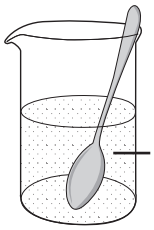
a

Class 6 are finding out about separating mixtures.

The teacher mixes sand and salt together.

She asks the children to separate the sand and salt.

First of all we should add water to the mixture of sand and salt and stir it.



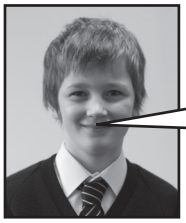
What happens to the salt when water is added to the mixture?

a

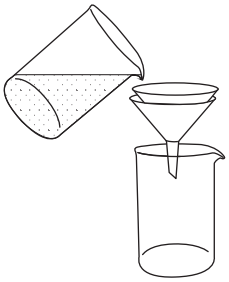
1 mark

S000350_01

b



We should now pour the mixture through paper in a funnel to separate the sand from the liquid.



(i)

What is this method of separation called?

bi

1 mark

S000350_03

(ii)

Describe how the sand is separated from the liquid.

The sand _____

The liquid _____

bii1

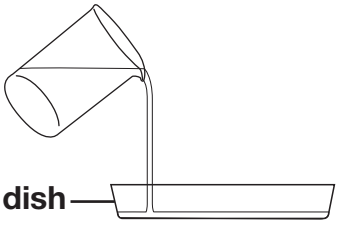
bii2

1 mark

S000350_04

c

We should pour the liquid from the beaker into a dish and put it in a warm place for a few days.



Tick **TWO** boxes to show what will happen when the dish has been in a warm place a few days.

Tick **TWO** boxes.

The liquid will be less salty.	☐	Bubbles will be produced.	☐
The salt will melt.	☐	The water will change to gas.	☐
Salt crystals will form.	☐	A new material is made.	☐

c1 c2 c3 c4 c5 c6

2 marks

S000350_05

d

The teacher mixes sand and iron nails together.

She asks the children to separate the sand from the iron nails.

Write **TWO** ways the sand could be separated from the iron nails.

1. _____

2. _____

d

2 marks

S000350_06

4 Pond depth

a Ben's class go to the school pond every day for five days.

At midday their teacher measures the depth of water in the pond.

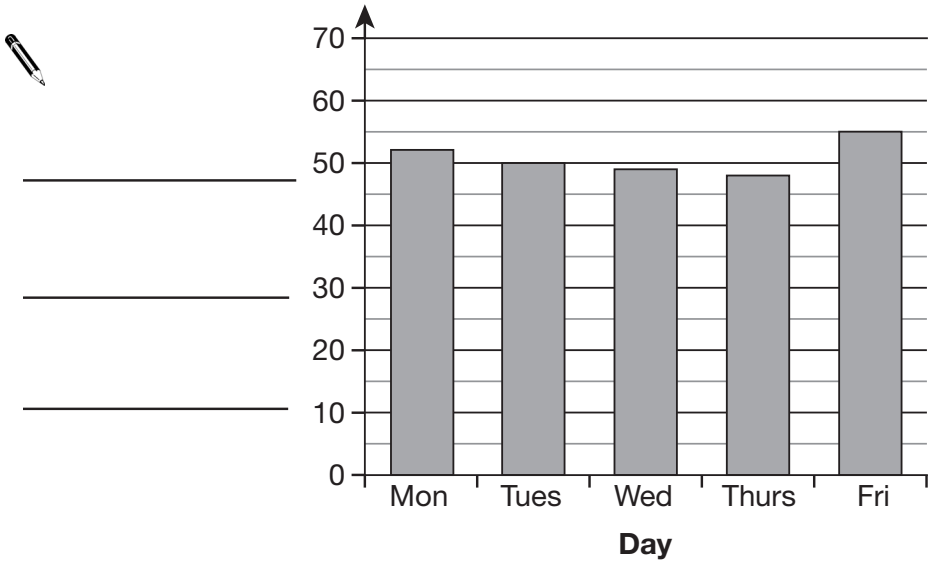
The children measure the air temperature.

They always take the measurements at the same place.

Day	Air temperature (°C)	Depth of water (cm)
Monday	17	52
Tuesday	19	50
Wednesday	21	49
Thursday	22	48
Friday	12	55

Ben plots a bar chart.

Complete the missing axis label with the unit.



a1

a2

1 mark

S000363_01

b On one morning it rained.

On the morning of which day of the week was it most likely to have rained? How can you tell?

Day: _____

I can tell because _____

b1

b2

1 mark

S000363_02

c (i) Heat is needed to raise the temperature of the air.
Where does this heat come from?

_____ ci

1 mark
S000363_03

(ii) Look at the table. Describe the pattern in the data between the **air temperature** and the **depth of the water** in the pond.

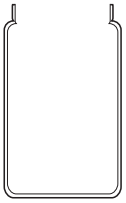
_____

_____ cii

1 mark
S000363_04

d Ben's class collect rainfall in the school garden.

They could use jam jars or measuring cylinders.



jam jar

measuring cylinder

(i) Write **ONE** advantage of using a jam jar.

_____ di

1 mark
S000363_05

(ii) Write **ONE** advantage of using a measuring cylinder.

_____ dii

1 mark
S000363_06

5 Mountains

a Class 6 find out about processes that happen on mountains.

Processes that happen on mountains

A – Water vapour in the air cools down to form water droplets.

B – Water droplets change into snow.

C – Snow on mountains changes into water.

D – Water changes into ice.

Tick **ONE** box in each row to match each process to its correct name.

Process	Name of process			
	melting	freezing	condensing	evaporating
A				
B				
C				
D				

a1
a2
a3
a4

2 marks

S000325_01

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2016 national curriculum tests

Key stage 2

Science sampling

Booklet 9C

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School name						

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Marks

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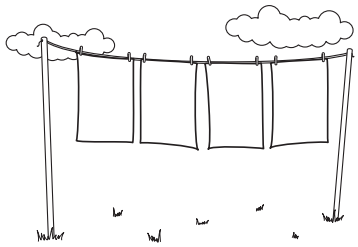
1 Drying fabric

a

Kate wants to test how much time it takes for four different types of fabric to dry.



1. She soaks the different types of fabric in water.
2. She hangs the fabrics on a washing line outside.
3. She measures how much time it takes for the fabrics to dry.

Kate's results are shown in the table below.

Fabric type	silk	cotton	nylon	polyester
Drying time (minutes)	60	100	50	35

Which fabric dried the fastest?

_____

a

1 mark

S000367_01

b

Kate carried out a fair test.

Read the four statements below.

1. Use fabrics that cost the same amount of money.
2. Use fabrics that are the same size.
3. Hang the fabrics up at the same time.
4. Hang the fabrics in the same place.

Which of these things would have helped make Kate's test fair?
Tick **ONE** box.

1 only	☐	1 and 3 only	☐
2 and 4 only	☐	2, 3 and 4 only	☐

b

1 mark

S000367_02

c Drops of water fall from the bottom of very wet washing hanging on a washing line.

Write **true** or **false** for each of the statements about the drops of water.

The drops…	**True** or **false**?	
form because liquids can flow.	_____	c1
may change shape as they fall.	_____	c2
form because the water becomes warm.	_____	c3

1 mark
S000367_03

d Harry dries some T-shirts indoors on a radiator.

Name the process that happens to the water in Harry's T-shirts as they dry.

_____ d

1 mark
S000367_04

e Harry saw that liquid water formed on the windows in the room when the T-shirts were drying on the radiator.

Name the process that causes liquid water to form on the windows.

_____ e

1 mark
S000367_05

2 Flowing oil

a

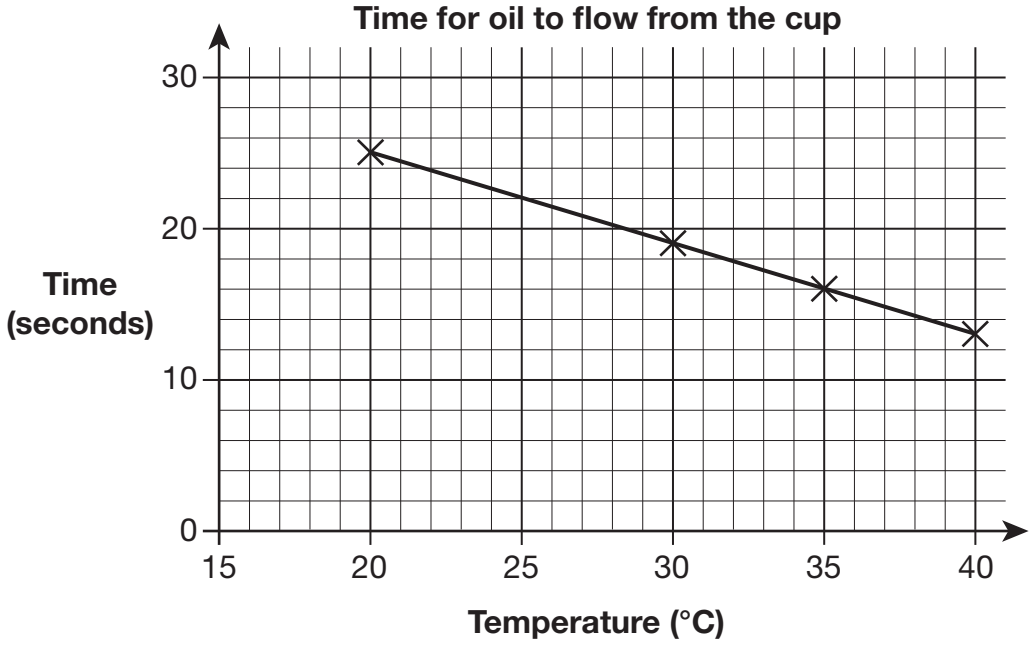
Jay and Lana want to find out how quickly cooking oil flows at different temperatures.

Jay has some oil at room temperature. He pours it into a cup with a hole in the bottom.

Lana measures the time it takes for 20 ml of oil to drip out of the cup.

They repeat this with oil heated to 30°C, 35°C and 40°C.

They record their results on a graph.



Use the graph to estimate how long it would take for the oil heated to **25°C** to drip out of the cup.

_____ seconds

a

1 mark

S000431_01

b As the oil becomes hotter, it flows more easily.

This changes the time it takes to drip out of the cup.

Use the graph. Describe how the **temperature** of the oil affects the **time** taken for the oil to drip out of the cup.

_____

_____

b

1 mark

S000431_02

c Describe **ONE** thing that Jay and Lana did to make their test fair.

_____

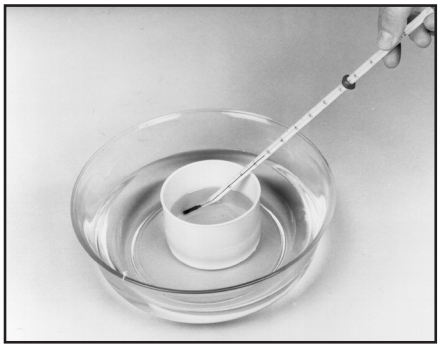
_____

c

1 mark

S000431_03

d The teacher told Jay and Lana to heat the oil by putting it in a bowl of hot water.



Give **ONE** reason why it could be dangerous to heat the oil over a flame.

_____

_____

d

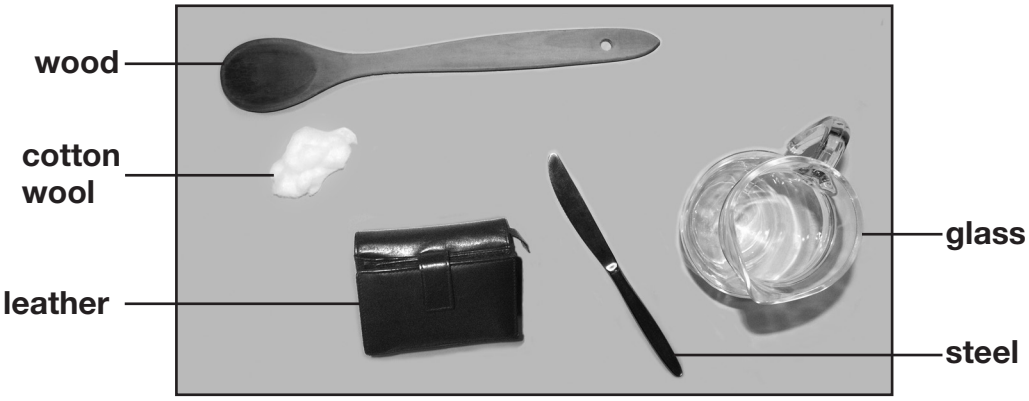
1 mark

S000431_04

3 Grouping materials

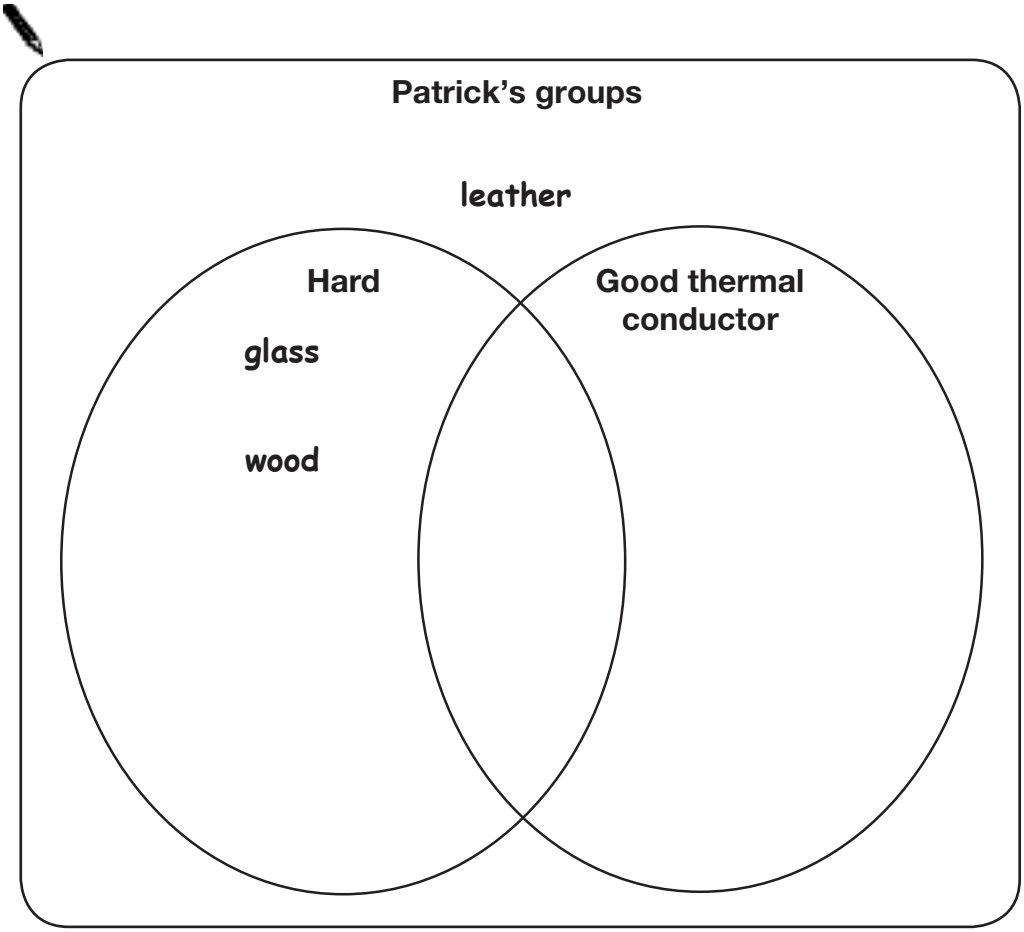
a Patrick collects some objects made of different materials.

The photograph below shows what he collects.



Patrick groups his materials in a diagram to help him sort them by their properties.

Write **cotton wool** and **steel** in the correct places on the diagram below.



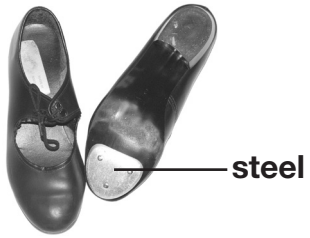
a1

a2

1 mark

S000429_01

b The shoes below are used for different activities. They are made out of different materials.



Tap dancing shoes

Wellington boots

The table below gives a property of steel and explains why this property is useful for tap dancing shoes.

Complete the table below to explain why it is useful for wellington boots to be impermeable.

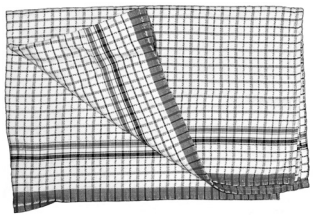
Material	Shoe	Property	Why the property is useful
steel	tap dancing shoe	**hard**	it makes a noise when hit
plastic	wellington boot	**impermeable**	_____ _____

b

1 mark

S000429_02

c This tea towel is made of a soft material.



Name **TWO** other properties of the soft material that make it good to use for a tea towel.

1. _____

2. _____

c

2 marks

S000429_03

a Copper, glass, iron and salt are solids.

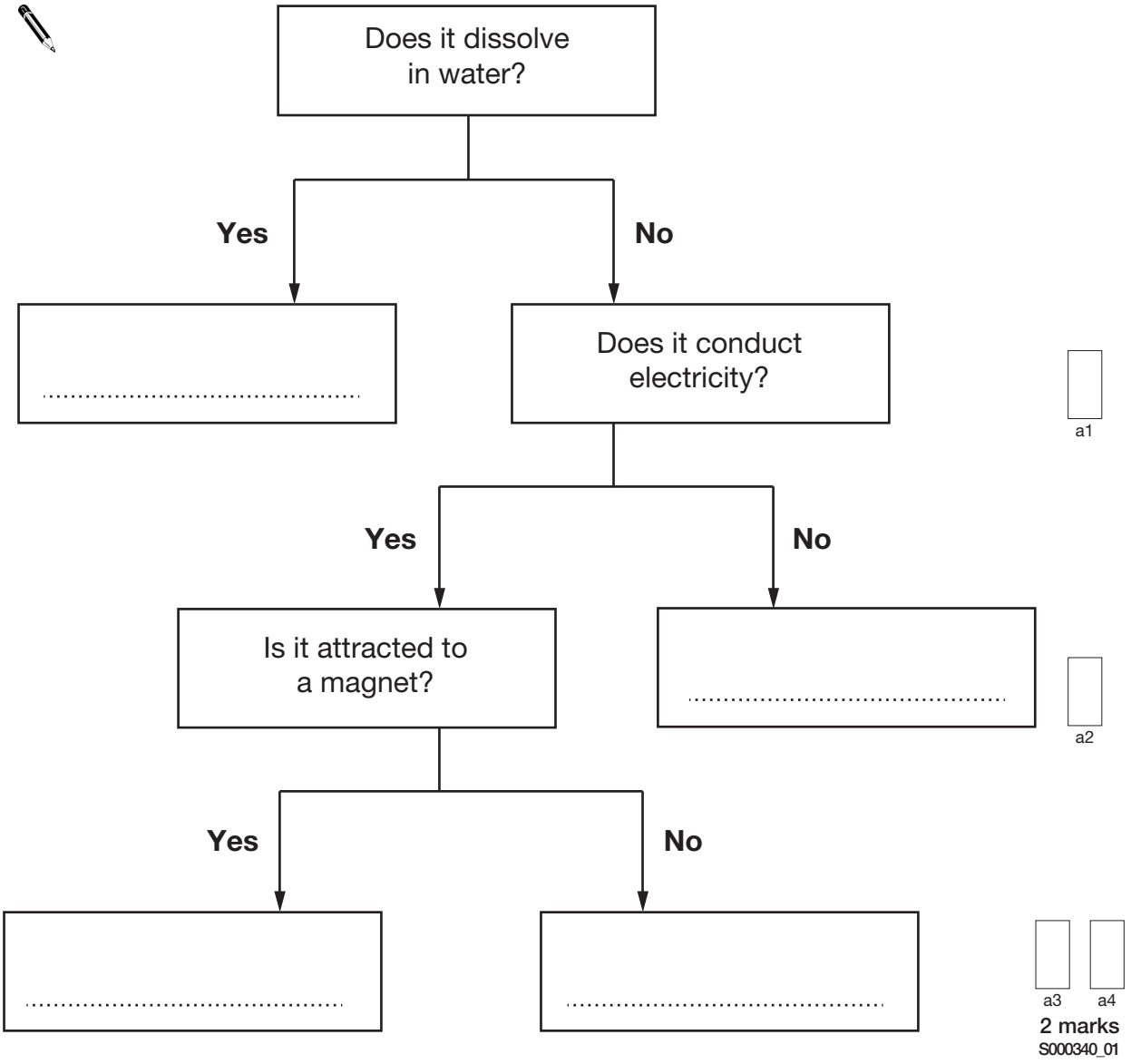
Copper

Glass

Iron

Salt

Complete the flow chart with the names of these four solids.
Write the names on the dotted lines.



a1

a2

a3 a4

2 marks

S000340_01

5 Science activity

a Sara adds vinegar to bicarbonate of soda and watches what happens.

The mixture fizzes and bubbles form.

Before mixing

bicarbonate of soda

vinegar

After mixing

bubbles

Explain why the **bubbles** show that a non-reversible change has happened.

_____

_____

a

1 mark

S000240_02

b Put a tick in each row of the table to show if each material is a **solid**, **liquid** or **gas**.

Material	Solid	Liquid	Gas
glass			
vinegar			
bicarbonate of soda			
the inside of a bubble			

b1

b2

b3

b4

2 marks

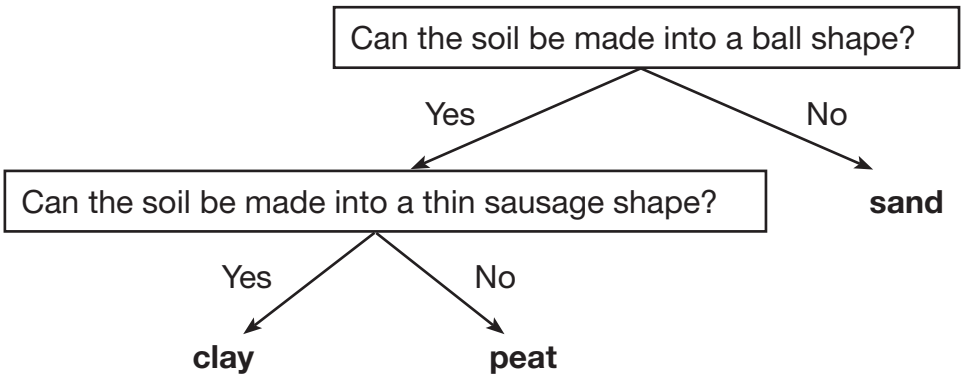
S000240_03

6 Soils

a Jenny has three different types of soil. She tries to squeeze each soil into different shapes. The table below shows her results.

Soil	Can the soil be squeezed into a... ball?	fat sausage?	thin sausage?
A	✓	✓	✗
B	✗	✗	✗
C	✓	✓	✓

This key identifies the soils:



Use the key above to identify the soils in the table.

Soil A is _____ **Soil B is** _____ **Soil C is** _____

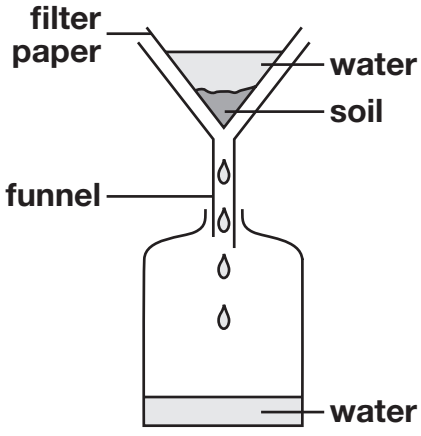
a1 a2 a3

1 mark

S000283_01

b Jenny measures the time it takes water to go through each soil.

She uses a stopwatch and this equipment:



Jenny needs to make sure her results are reliable.

Tick **ONE** box to show how Jenny can make sure her results are more reliable.

Use the same equipment each time.	☐	Record her results in a table.	☐
See if the results match her predictions.	☐	Test each soil several times.	☐

b

1 mark

S000283_02

c

Here are Jenny's results:

	Type of soil		
	clay	**peat**	**sand**
Volume of water put into the funnel (cm^3)	50	50	50
Volume of water collected in the bottle (cm^3)	40	47	49
Time for water to stop dripping out of the funnel (minutes)	9	2	2

How much water stayed in the peat soil?

_____ cm^3

c

1 mark

S000283_03

d

Circle the correct boxes to complete each conclusion below.
Use the results table to help you.

Water takes longer to pass through peat soil. **sand** / **clay** soil than through

d1

More water stays in **sand** / **clay** soil than in peat soil.

d2

1 mark

S000283_04

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2016 national curriculum tests

Key stage 2

Science sampling

Booklet 12P

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School name						

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Marks

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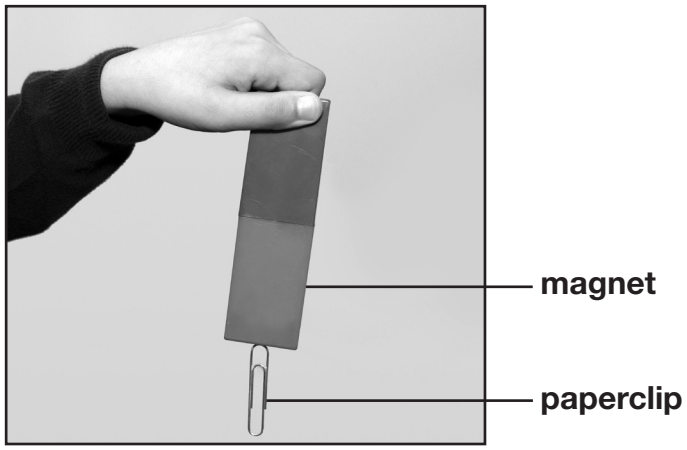
1 Magnetic forces

a Ali has four different magnets and some paperclips.

The paperclips are attracted to the magnets.

Draw **ONE** arrow on the photograph to show the direction of the magnet's force on the paperclip.



a

1 mark

S000278_01

b Name the force on the paperclip that pulls in the opposite direction to the magnet.

_____

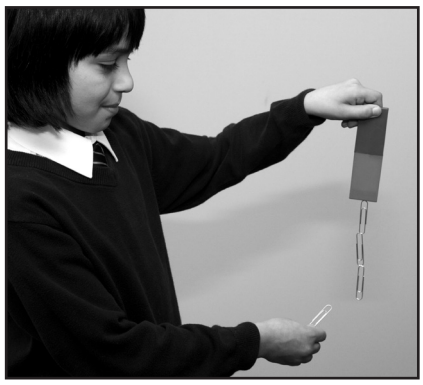
b

1 mark

S000278_02

c Ali wants to find the strongest magnet. He adds paperclips to a magnet one at a time so they make a chain. He stops when no more paperclips stick.

He repeats this with the other three magnets.



How will Ali know which magnet is the strongest?

_____

_____

c

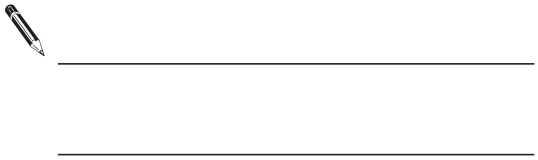
1 mark

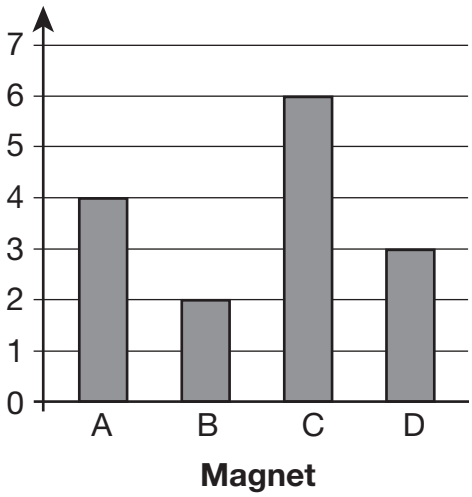
S000278_03

d The graph below shows Ali's results.

One axis on the graph has been labelled.

Write the label for the **other** axis.





d

1 mark

S000278_04

e Ali moves magnet A towards magnet B.
Magnet B moves away from magnet A even though Ali does not touch magnet B.

Why did magnet B move away from magnet A?

e

1 mark

S000278_05

f Ali tries different ways of putting the magnets together.

Tick **ONE** box on each row of the table to show if the magnets move together, move apart or do not move.

The first one has been done for you.

Magnets	Move together	Move apart	Do not move
	✓		
			
			
			

f1

f2

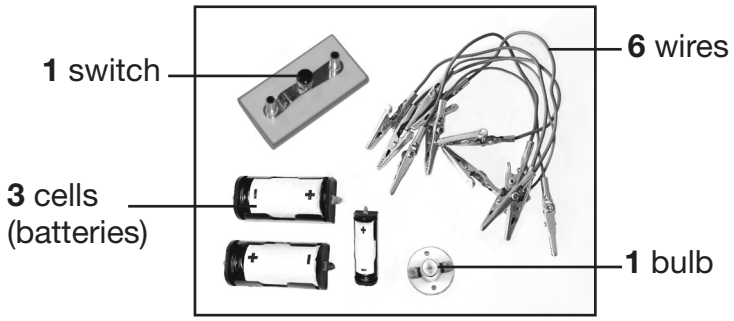
f3

1 mark

S000278_06

2 Electricity investigation

a Lena has this equipment:



Tick **THREE** boxes to show which questions Lena could investigate using only the equipment shown above.

Tick **THREE** boxes.

- Do different cells affect the brightness of a bulb? ☐ a1
- How many bulbs can be lit by one cell? ☐ a2
- Does the number of cells affect the brightness of a bulb? ☐ a3
- Does the number of switches affect the brightness of a bulb? ☐ a4
- Does the direction of cells affect the brightness of a bulb? ☐ a5

2 marks
S000260_01

b Draw **FOUR** lines to match the electrical components to their symbols.

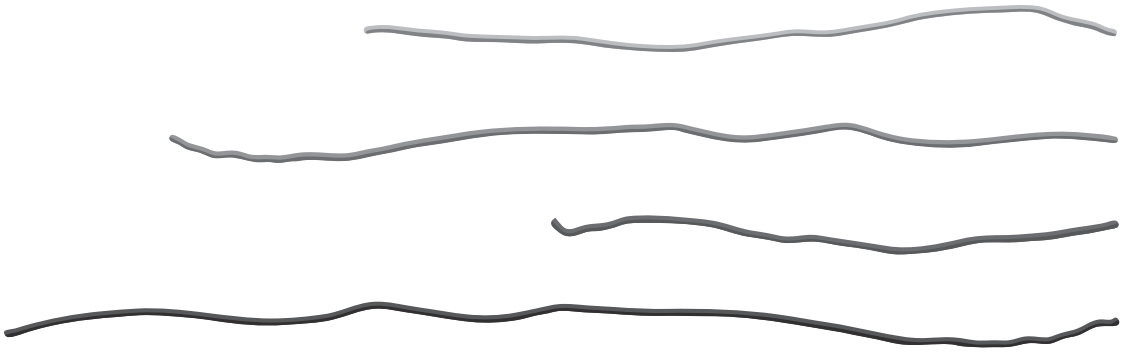
Electrical component	bulb	wire	cell	switch
Symbol		M		

b1 b2 b3 b4

1 mark
S000260_02

c Lena collected these wires.

The wires are made of **different metals**.



Lena says, 'I want to know if the wires made of different metals will change the brightness of the bulb in the circuit.'

What must Lena do to the wires to make her test fair?

_____ c

1 mark

S000260_03

d Lena makes her test fair.

Tick **TWO** boxes to show the **two** pieces of evidence Lena should collect for her results.

Tick **TWO** boxes.

how quickly the bulb lights up	☐	how bright the bulb is	☐
how many wires there are	☐	what metals the wires are made of	☐

d1 d2 d3 d4

1 mark

S000260_04

3 The solar system

a Joe is finding out about the solar system.
He writes four statements about the Sun.

Write **true** or **false** next to each statement about the Sun.

	True or **false**?	
The Sun is a light source.	_____	a1
The Sun orbits the Earth.	_____	a2
The Sun is smaller than the Earth.	_____	a3
The Sun is a circle.	_____	a4

2 marks
S000220_01

b Joe finds out that days and years take different amounts of time on different planets.

Planet	Time for one day (Earth days)	Time for one year (Earth days)
Mercury	59	88
Venus	243	225
Earth	1	365
Mars	1	687
Jupiter	0.4	4329

Look at the table.

(i) Which planet has the shortest day?

_____ bi

1 mark
S000220_02

(ii) Which planet orbits the Sun quickest?

_____

bii

1 mark

S000220_03

c

The planets with shorter days have shorter years.

Joe

Look at the table opposite.

Do the planets with shorter days have shorter years? Tick **ONE** box.

yes ☐ no ☐

c1

Use the information in the table to explain your answer.

_____

_____

c2

1 mark

S000220_04

d All of the planets in our solar system have days and nights.

What movement in space causes day and night on Earth?

_____

d

1 mark

S000220_05

4 Investigating grip

a Andy and Jun have different ways of testing how well different shoes grip.

Andy's plan	Jun's plan
1) Ask someone to run in the playground. 2) Time how long it is before they fall over. 3) Do the test again with different shoes.	1) Put the shoe on a table and tie string to it. 2) Add a weight to the other end of the string and let it hang over the edge of the table. 3) See how much weight it takes to move each shoe.

Complete the table below to show the units that Andy and Jun could use to measure their results.

What will be measured?	What is the unit of measurement?
how much **time** it takes to fall over	_____
how much **weight** it takes to move the shoe	_____

ai
1 mark
S000262_01

aii
1 mark
S000262_02

b Andy and Jun both plan to make their tests fair.

Suggest **ONE** reason why Jun's plan is better than Andy's plan.

Jun's plan is better because _____

_____

b
1 mark
S000262_03

c They decide to use Jun's plan to test some shoes.

Shoe A

Shoe B

Shoe C

Shoe D

Jun predicts that shoe D will have the **least** grip. Look at the shoes.

Explain why shoe D is likely to have the least grip.

_____ c

1 mark

S000262_04

d Look at the table of results.

Shoe	**A**	**B**	**C**	**D**
Weight needed to move the shoe (units)	250	100	125	25

Do the results support Jun's prediction that shoe D will have the least grip? Tick **ONE** box.

yes ☐ no ☐ d1

Explain how the results support or do not support Jun's prediction.

_____

_____ d2

1 mark

S000262_05

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2016 national curriculum tests

Key stage 2

Science sampling

Booklet 14P

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Please do not write on this page.

Instructions

Please read this carefully.

Questions and answers

You have **25 minutes** to complete this test.

Follow the instructions for each question.

 This pencil shows where you will need to put your answer.

For some questions you may need to draw an answer instead of writing one.

Do not write or draw over any barcodes or in the grey margins.

If you cannot do one of the questions, **go on to the next one**.

You can come back to it later, if you have time.

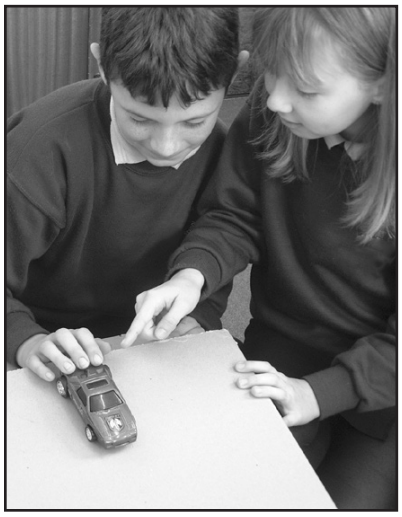
If you finish before the end, **go back and check your work**.

Marks

The number under each box at the side of the page tells you the maximum number of marks for each question.

1 Car

a Two children investigate the distance four different cars travel when they let them roll down the slope.



What equipment should they use to measure how far a car has travelled?

_____

a

1 mark

S000428_01

b Linda says, 'It is better to measure how far each car goes than just look.'

Why is measuring the distance better than just looking to find out how far each car goes?

_____

_____

b

1 mark

S000428_02

c John wants to push **one** car down the slope.
Linda thinks that **all** four cars should roll down the slope.

Why will the test be unfair if John pushes **one** of the cars down the slope?

_____

_____

c

1 mark

S000428_03

d The children carry out their investigation.

What is the **ONE** variable the children **change** as they carry out their investigation?

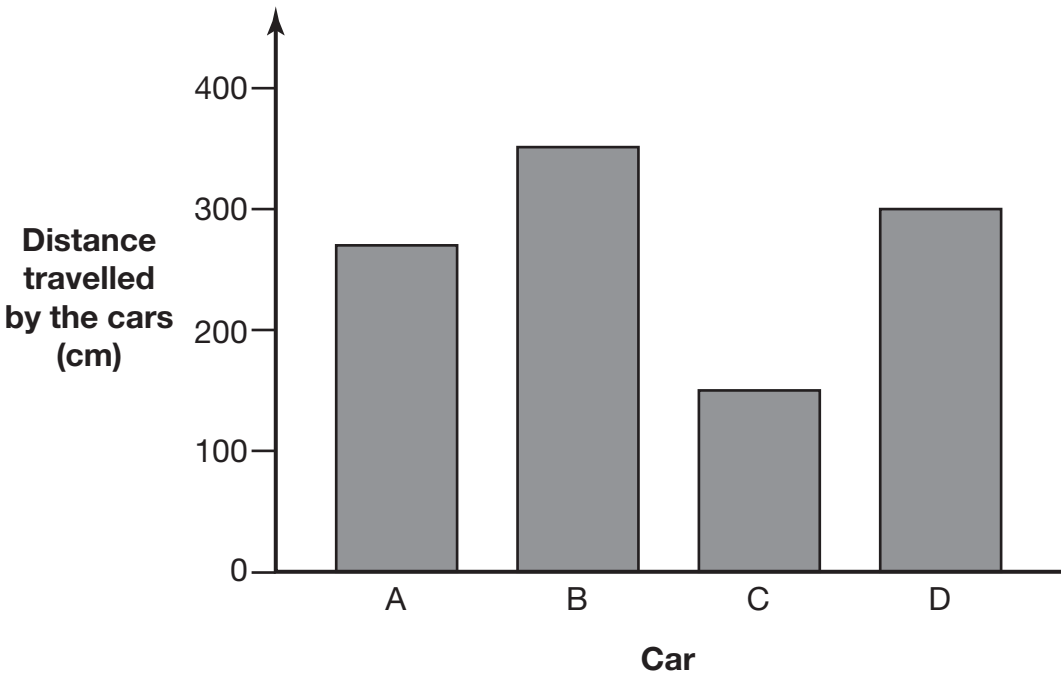
_____

d

1 mark

S000428_04

e Linda and John record their results in a bar chart.



They discuss the results in the bar chart and write some conclusions.

Look at the results to decide whether each conclusion is **true**, **false** or you **can't tell**.

Tick **ONE** correct box for each conclusion.

	True	False	Can't tell
Car C went the shortest distance.	☐	☐	☐
Car C was the smallest.	☐	☐	☐
Car D went furthest.	☐	☐	☐

e1

e2

e3

1 mark

S000428_05

2 Famous scientist

a What shape is the Sun?

_____

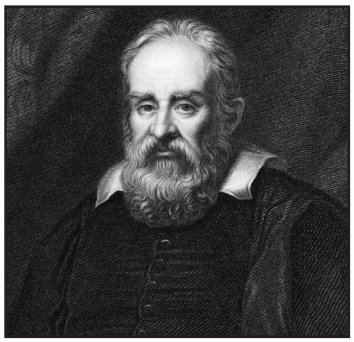
a

1 mark

S000219_01

b

Galileo developed the equipment that scientists use to see the Sun, Moon, stars and planets in more detail.



Galileo (1564–1642)

Name the equipment that scientists use to see into space.

_____

b

1 mark

S000219_02

c The Moon orbits the Earth.

Tick **ONE** box to show how much time the **Moon** takes to orbit the Earth.

1 day	☐	24 days	☐
28 days	☐	365 days	☐

c

1 mark

S000219_03

d People used to think the Sun orbited the Earth because the Sun seems to move across the sky every day.

What movement in space makes the Sun seem to move across the sky every day?

_____ d

1 mark
S000219_04

e Galileo believed the Earth orbited the Sun.

His observations into space gave evidence to support his idea.

Why is it important to get evidence to support a scientific idea?

_____

_____ e

1 mark
S000219_05

f Galileo said that the Earth stays in the same orbit as it travels around the Sun.

Write **true** or **false** next to each sentence to show what it would be like if the Earth's orbit was further away from the Sun.

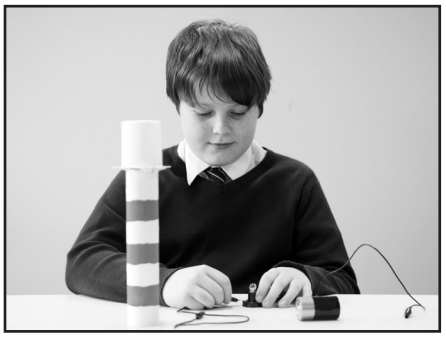
If the Earth's orbit was further away from the Sun...	**True** or **false**?	
the Earth would be colder.	_____	f1
the Earth would be darker.	_____	f2
the Earth would not have night-times.	_____	f3
the Earth would have longer years.	_____	f4

2 marks
S000219_06

3 Lighthouse

a

George makes a model lighthouse using a cardboard tube and a yoghurt pot.



He makes a circuit to make his lighthouse light up.

The yoghurt pot lets some light through.

What is the name given to a material that lets only some light through?

_____

a

1 mark

S000216_01

b

George wants to make his lighthouse have a brighter light.

Tick **ONE** box to show what George could use instead of a yoghurt pot to make the lighthouse appear brighter.

plastic cup ☐

tin can ☐

china egg cup ☐

part of cardboard egg box ☐

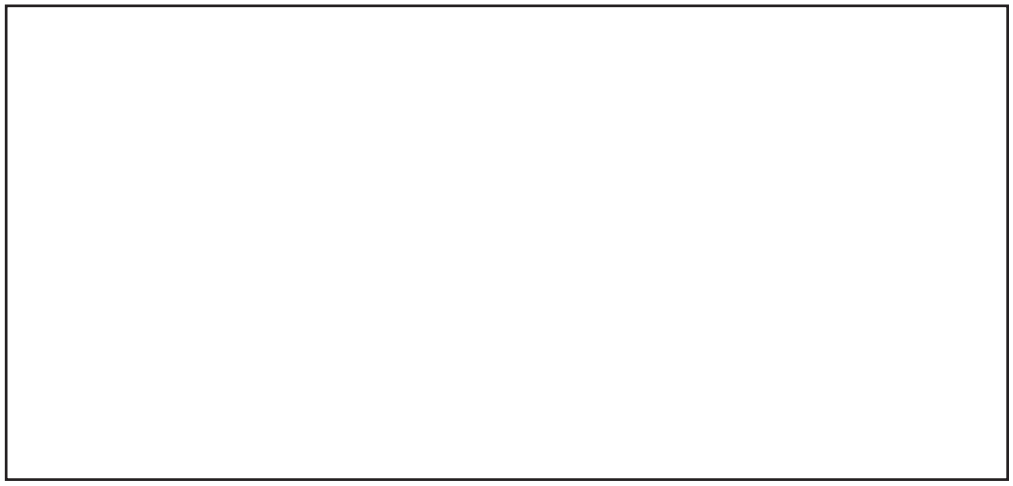
b

1 mark

S000216_02

c George uses one bulb, one cell (battery) and two wires to make the circuit for his lighthouse.

Draw the circuit diagram using the correct symbols for the lighthouse.



c1

c2

2 marks

S000216_03

d Write **true** or **false** next to each sentence about the circuit.

George's circuit will only work if...	**True** or **false**?	
the cell is connected to the bulb.	_____	d1
there are gaps in the circuit.	_____	d2
he uses wires of the same length.	_____	d3
the wires are connected to the same end of the cell.	_____	d4

2 marks

S000216_04

e What component should George add to his circuit to make the light brighter?

_____

e

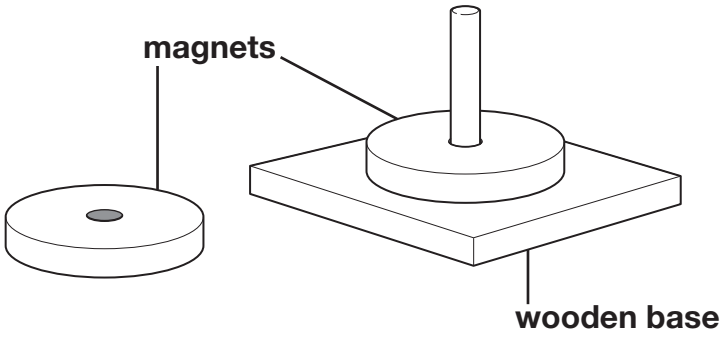
1 mark

S000216_05

4 Magnets

a Avi has two magnets.

The magnets have holes in them so they can slide onto a base.
They can be put on a wooden base either way up.



Which of the following items could Avi pick up with the magnets?
Tick **ONE** box.

plastic pen	☐	iron nail	☐
glass marble	☐	rubber ball	☐

a

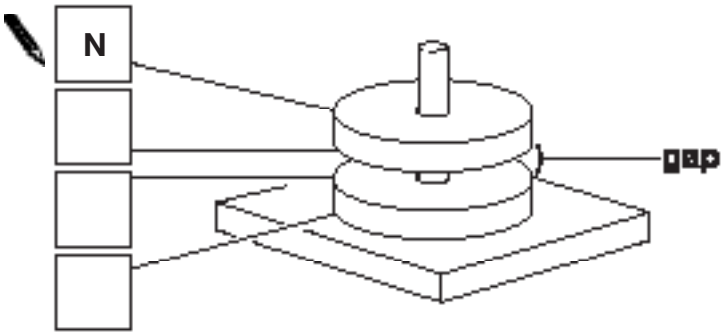
1 mark

S000372_01

b Avi puts the two magnets on the base. The magnets do not touch.
The top magnet hovers above the bottom magnet.

Write **N** (North) or **S** (South) in each box to show the poles of the magnets.

The first one has been done for you.



b1

b2

b3

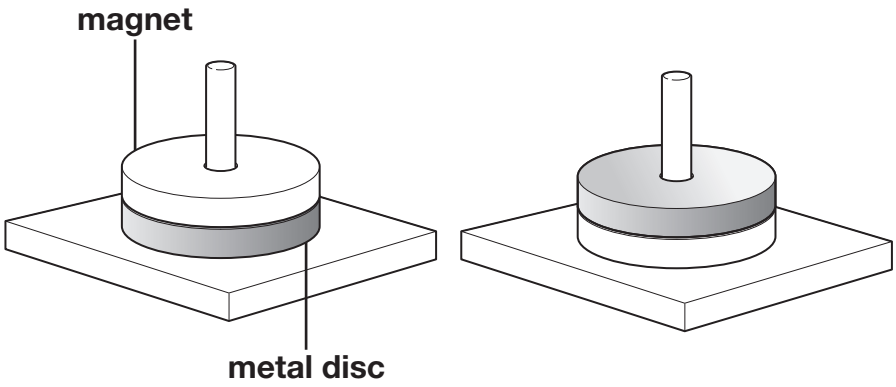
1 mark

S000372_02

c Avi has a metal disc. It is exactly the same size as the magnets.

He puts the metal disc and a magnet on the base in two ways.

Look at the pictures.



It is not possible to tell from the pictures if the disc is made of a magnetic metal.

Explain why you cannot tell if the metal disc is made of a magnetic metal.

_____

_____

c

1 mark

S000372_04

Standards & Testing Agency

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