PROPERTIES OF MATERIALS

Starburst

Look at this chart. Ameena has been testing the properties of materials to see which materials would be good for making an umbrella.

Her results are shown opposite.

Material	Transparent	Strong	Waterproof	Light
Cotton	✗	✓	✗	✓
Clear polythene	✓	✓	✓	✓
Tissue paper	✗	✗	✗	✓
Kitchen foil	✗	✓	✓	✓
Perspex	✓	✓	✓	✓

(a) Which materials were both transparent and waterproof?

[ ] [ ] 2 marks

(b) Why would cotton not be a good material to use for an umbrella?

_____ 1 mark

(c) Which material might Ameena have thought was best for an umbrella, and why?

_____ 2 marks

2 Laura has just bought a new pair of trainers for running.

Zoom3

is the latest in running footwear. It is guaranteed to improve your speed when running on any surface. *Zoom3* features a reflective patch on the heel and toe cap, a thick rubber sole and waterproof fabric upper.

Why do you think that each of these features has been included in the design of the shoe?

reflective patches _____ 1 mark

rubber sole _____ 1 mark

waterproof fabric _____ 1 mark

TOTAL [ ]

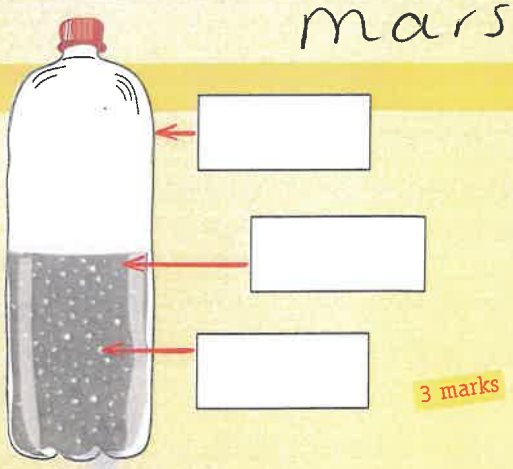
How did you score?

4 or less – try again!
5 or 6 – nearly there!
7 or 8 – well done!

SOLIDS, LIQUIDS, GASES

mars

Ellie has a bottle of cola.



(a) Complete the labels using the words: solid, liquid, gas.

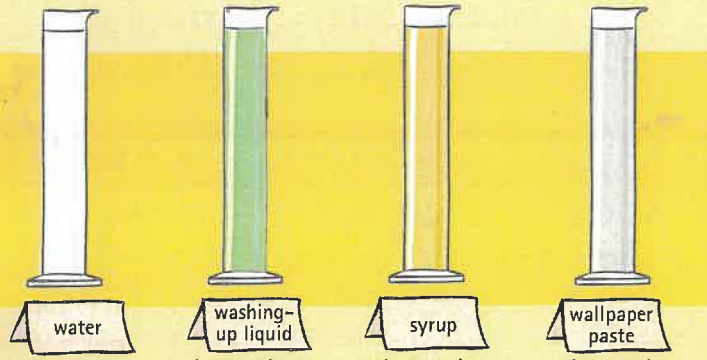
(b) Ellie leaves the top off the bottle for several hours. She pours some of the cola into a glass. The cola is no longer fizzy.

What happened to make the cola no longer fizzy?

3 marks

1 mark

Asim is testing different liquids. He has four cylinders, each containing a different liquid. He drops a marble into each cylinder and times how long it takes the marble to fall to the bottom.



(a) Which liquid property is Asim testing?

colour ☐ thickness ☐ smell ☐ stickiness ☐

1 mark

(b) What conclusion can you draw using the results of Asim's test?

1 mark

Kylie has two balloons. One is filled with air and the other is filled with a gas called helium. She notices that the balloon filled with helium floats up to the ceiling and the balloon filled with air lies on the floor.

(a) What do her observations tell you about the gas helium?

1 mark

(b) She bursts the balloon filled with helium with a pin. Where does the helium go?

1 mark

TOTAL ☐

How did you score?

4 or less – try again!
5 or 6 – nearly there!
7 or 8 – well done!

NON-REVERSIBLE CHANGES

stamu x

1 Ian is making a birthday cake. He makes the cake mixture by mixing together butter, flour, sugar and eggs in a bowl using an electric mixer.

(a) Which of the ingredients can he get back out of the mixture?

all of them ☐ only butter ☐

none of them ☐ butter and eggs ☐ 1 mark

(b) Which word best describes the type of change that has taken place?

☐ 1 mark

(c) Ian puts the cake mixture into a baking tin and bakes it in the oven for 30 minutes. What would happen to the cake if he baked it for 3 hours?

1 mark

(d) Ian wants to coat the top of the cake with chocolate. He gently warms some pieces of chocolate in a bowl. What change happens to the chocolate?

1 mark

(e) How will this change help Ian to put the chocolate on the top of the cake?

1 mark

(f) When the cake is finished Ian puts some candles on it. He lights the candles with a match and notices that as the candles burn they all get shorter. Which word in the last sentence suggests that this change is permanent?

☐ 1 mark

(g) Which word describes what Ian is doing?

observation ☐ experiment ☐ survey ☐ plan ☐ 1 mark

(h) What will have happened to the match after Ian used it to light the candles?

1 mark

TOTAL ☐

How did you score?

4 or less – try again!
5 or 6 – nearly there!
7 or 8 – well done!

METHODS OF SEPARATION

Milky Way

1 Amy has been told that salt will dissolve in water to form a solution.
She puts 200 cm^3 of water into a beaker.
Amy then adds one teaspoon of salt and it dissolves.

(a) What could she do to the water to make the salt dissolves more quickly?

_____ 1 mark

(b) What will eventually happen if she keeps adding more teaspoonfuls of salt to the solution?

_____ 1 mark

(c) Amy now pours the mixture through a filter paper cone.
What will she see on the filter paper?

_____ 1 mark

(d) What will she see in the beaker?

_____ 1 mark

2 It is possible to separate salt from a solution of salt in water.

Describe how you could do this.
Mention the equipment you would use in your answer.

_____

_____ 2 marks

3 Which two of these solids dissolve in water?

sugar ☐ tea leaves ☐ washing powder ☐

pepper ☐ chalk ☐ 1 mark

4 Amy has a mixture of rice and flour.

Name a piece of equipment she could use to separate the rice from the flour.

_____ 1 mark

TOTAL ☐

How did you score?

4 or less – try again!
5 or 6 – nearly there!
7 or 8 – well done!

CONDUCTORS AND INSULATORS

Galaxy

A material which allows heat to travel through it is called a thermal conductor.
A material which does not allow heat to travel through it is called a thermal insulator.

(a) Decide which of the following are conductors and which are insulators, and write their names in the table below.

plastic ruler
copper pipe
oven gloves
polystyrene tile
wooden spoon
cooking foil

thermal conductors	thermal insulators

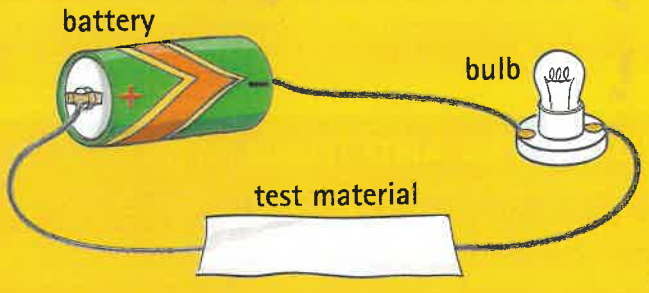
3 marks

(b) Why is a saucepan made of metal, yet the handle is often made of wood or plastic?

_____

1 mark

2 Steven has been investigating which materials are the best conductors of electricity. He has tested each material by making it part of an electrical circuit.



Test materials:

- plastic spoon ☐
- kitchen foil ☐
- metal fork ☐
- piece of string ☐
- strip of cardboard ☐

(a) Decide whether the bulb will light up when each of the test materials in turn is placed in the circuit.
Tick the boxes in the diagram above for those that conduct electricity.

2 marks

(b) Steven notices that the wires he used in his circuit have strands of copper on the inside and plastic on the outside.
Explain why these two different materials are used.

(i) copper strands _____

_____

1 mark

(ii) plastic coating _____

_____

1 mark

TOTAL ☐

How did you score?

4 or less – try again!
5 or 6 – nearly there!
7 or 8 – well done!