

Speeding up/pressure and moments

9K & 9L



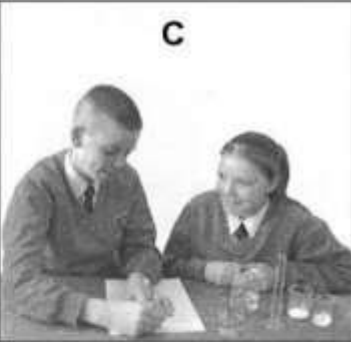
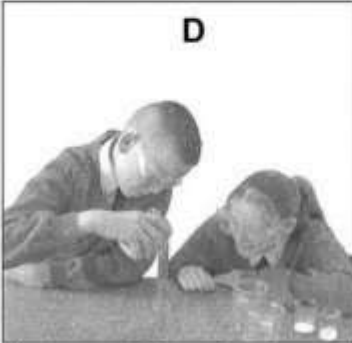

27 min

27 marks

Q1-L3, Q2-L4, Q3-L4, Q4-L5, Q5-L6

1. Some pupils carried out an investigation to find out whether more sugar or more salt dissolved in water at 60°C.

Here are some of the steps in their investigation.
They are **not** in the correct order.

 <p>A</p>	 <p>B</p>	 <p>C</p>
<p>They added salt to one beaker of water at 60°C and sugar to the other beaker of water at 60°C.</p>	<p>They stirred the mixtures.</p>	<p>They recorded their results.</p>
 <p>D</p>	 <p>E</p>	
<p>They put 20 cm³ of water at 60°C into two beakers.</p>	<p>They collected this equipment.</p>	

- (a) Put the letters **A, B, C, D** and **E** in the boxes below to show the correct order of the steps in their investigation.

1st 2nd 3rd 4th 5th

1 mark

- (b) Why did they use a measuring cylinder?

.....

1 mark

- (c) They used water at 60°C in both beakers.

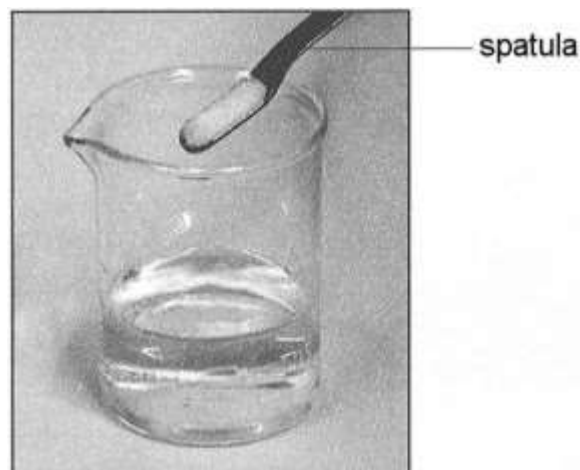
What else did they do to make their investigation fair?

.....

.....

1 mark

- (d) They counted the number of spatulas of sugar or salt added to the water until **no** more would dissolve.



- (i) Why was this **not** an accurate method of measuring how much sugar or salt they added?

.....

.....

1 mark

- (ii) Suggest a more accurate method of measuring how much sugar or salt they added.

.....

.....

1 mark

(e) Jane predicted that more sugar than salt would dissolve.

Complete the table to show a result which would support Jane's prediction.

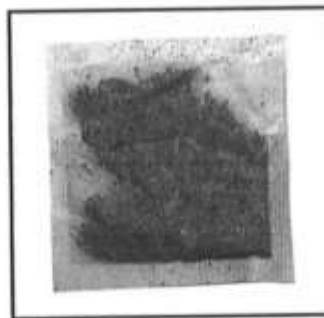
	sugar	salt
number of spatulas	32	

1 mark
maximum 6 marks

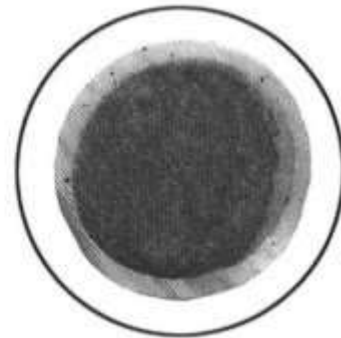
2. Tea bags are made in different shapes.



triangle



square



circle

Some pupils want to find out which shape of tea bag lets tea dissolve most quickly. They make two plans for their investigation as shown below.

FIRST PLAN

We will use 3 tea bags and 3 beakers

SECOND PLAN

Collect three beakers.

Collect three different tea bags.

Put one tea bag in each beaker.

Add 150 cm³ of water at 65°C.

Keep the temperature of the water the same.

Measure the time taken for the tea to dissolve.

Find out which is the quickest for making tea.

(a) How is the second plan better than the first plan?

.....
.....

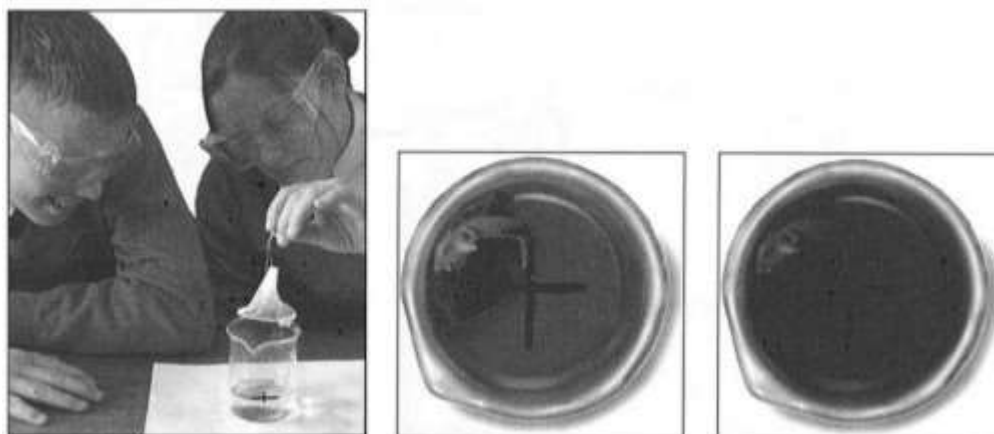
1 mark

(b) Why should they take care when they add hot water at 65°C to the tea bags?

.....
.....

1 mark

(c) Ben and Vicky drew a cross on some paper. They put each beaker, in turn, over the cross. They poured hot water into the beaker, dropped in the tea bag and watched the water change colour.



To see which shape of tea bag let the tea dissolve the quickest, they measured the time until the liquid was too dark for them to see the cross.

How did the cross help to make their test more accurate?

.....

1 mark

(d) (i) They recorded their measurements in a table as shown below.

shape of tea bag	time taken until cross cannot be seen (minutes)
triangle	8
square	15
circle	10

Which part of their investigation was recorded in the table?
Tick the correct box.

explanations	<input type="checkbox"/>	results	<input type="checkbox"/>
conclusions	<input type="checkbox"/>	plans	<input type="checkbox"/>

1 mark

(ii) Give the **three** shapes of tea bags in the order in which the tea dissolved.
Use the table above to help you.

quickest _____ slowest

1 mark

maximum 5 marks

3. Tom tries on four types of footwear in a sports shop.



ski boot



trainer



ice skate



walking boot

(a) (i) When Tom tries on the footwear, which one sinks into the carpet the most?

.....

1 mark

(ii) When Tom tries on the footwear, what is the same for each type of footwear? Tick the correct box.

the area of the footwear

Tom's weight on the footwear

the material of the footwear

the weight of the footwear

1 mark

(b) The drawing below shows a snowshoe.



How do snowshoes help people to walk in deep snow?

.....
.....

1 mark

(c) Choose the correct word from the list to complete the sentence below.

air resistance friction gravity magnetism

When Tom is ice skating the force of
between the skate and the ice is less than when he is walking on a carpet.

1 mark

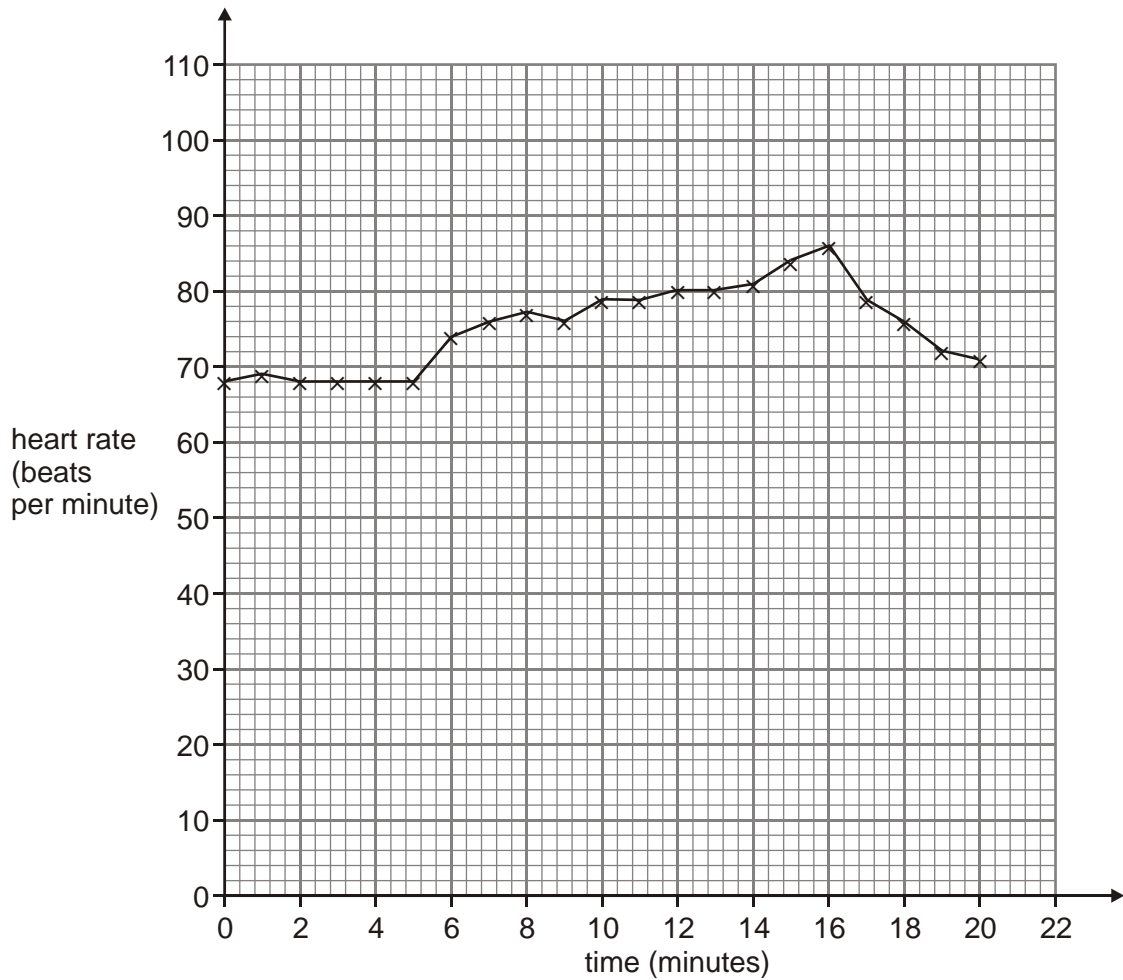
Maximum 4 marks

4. Harry investigated the effects of fizzy cola drink on his heart rate.

First he measured his heart rate every minute for 5 minutes when sitting down. Then he drank some cola.

He continued to measure his heart rate at regular intervals.

This is a graph of his results.



(a) Why did Harry measure his heart rate every minute for 5 minutes before drinking his cola?

.....
.....

1 mark

(b) Harry says cola affects his heart rate.

What evidence is there in the graph to support his idea that cola affects his heart rate?

.....
.....

1 mark

(c) Harry and Yasmin came to the following conclusions.



Harry

Yasmin

Explain why Yasmin's conclusion is better than Harry's conclusion.

.....

.....

1 mark

(d) Yasmin said, "We should also measure Harry's heart rate after he drinks fizzy water".

How would measuring Harry's heart rate after he drinks fizzy water improve the investigation?

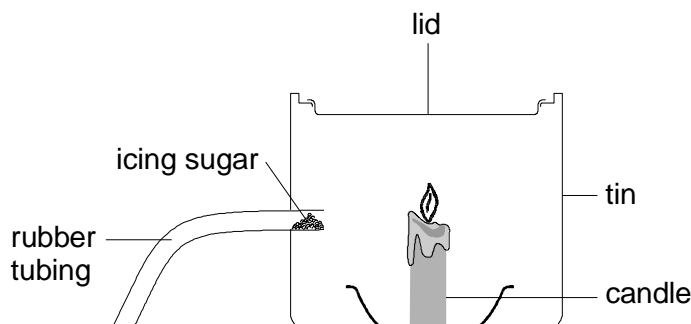
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1 mark

maximum 4 marks

5. A teacher set up the following apparatus behind a safety screen. She placed 1 g of icing sugar in the end of the rubber tubing inside the tin, as shown below.



The teacher blew through the other end of the rubber tubing.
The icing sugar came into contact with the flame.
There was a loud explosion and the lid was blown off the tin.

- (a) Complete the following sentence describing the energy changes which took place.

..... energy in the icing sugar changed to
..... energy and energy.

3 marks

- (b) As a result of the explosion, the lid of the tin was pushed off.
Explain what had happened to the gas molecules inside the tin to make this happen.

.....
.....
.....
.....

2 marks

- (c) When icing sugar is burned in this experiment, the gas **used** and the gas **produced** are the same as when energy is released from sugar in the cells of the body.

- (i) Which gas, in the air, is **used** when the icing sugar burns?

.....

1 mark

- (ii) Give the name of the gas **produced** when the icing sugar burns.

.....

1 mark

(d) The table below shows the energy values of four food substances.

food substance	energy value, in kJ per 100 g
icing sugar	1680
curry powder	979
flour	1450
custard powder	630

The teacher repeated the experiment with 1 g of custard powder.
What difference would this make to the experiment?

.....
.....

1 mark
Maximum 8 marks