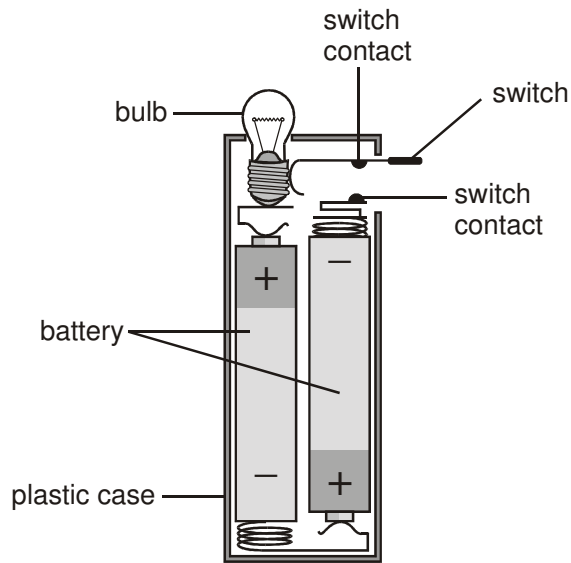


Name:

Target level:

Energy HSW HW2

1. (a) The drawing below shows the parts of a torch.

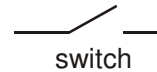
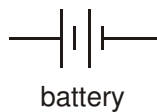
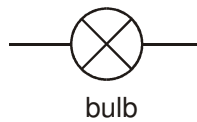


- (i) Paul closed the switch.
Why did this turn on the torch?

.....
.....

1 mark

- (ii) The diagrams below show symbols for a battery, a bulb and a switch.
Connect the symbols to make a series circuit for the torch.

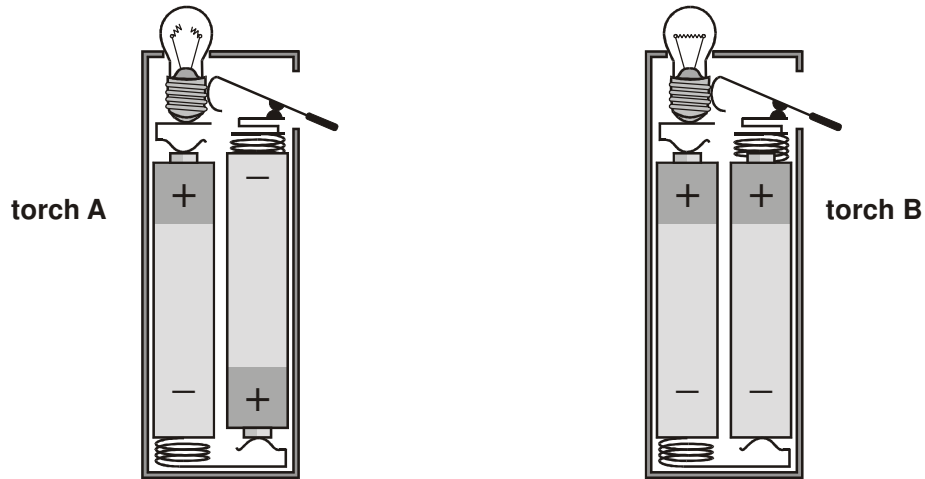


1 mark

Name:

Target level:

- (b) The drawings below show two other torches. In both torches, the bulbs will **not** light even when Paul closes the switches.



Look carefully at the drawings.

- (i) Why is the circuit of torch A **not** complete?

.....

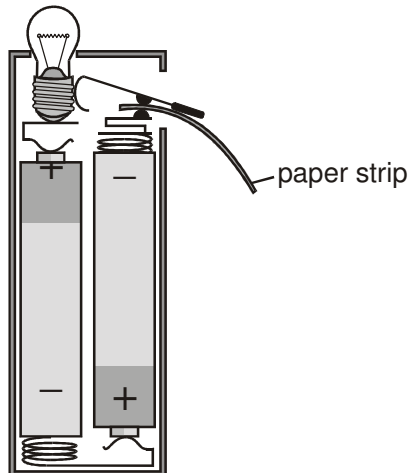
1 mark

- (ii) What could you do to torch B to get the bulb to light?

.....

1 mark

- (c) When Paul bought his torch there was a paper strip between the contacts of the switch as shown below.



Paul had to remove the paper strip before he could turn the torch on.
Give the reason for this.

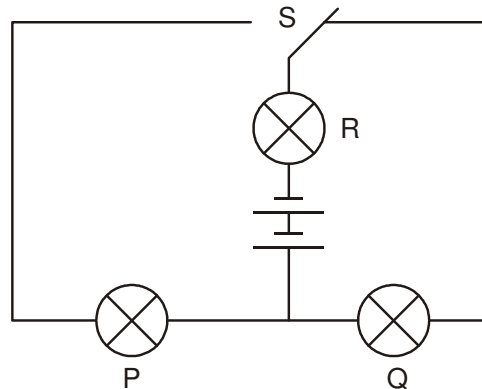
.....
.....

1 mark

Name:

Target level:

2. (a) The diagram below shows a circuit with a two-way switch, S.
Rosie puts the switch in the position shown below.



Complete the table below to show if the bulbs are on **or** off.
Write **on** or **off** for each bulb.

(1 mark)

bulb	on or off
P	
Q	
R	

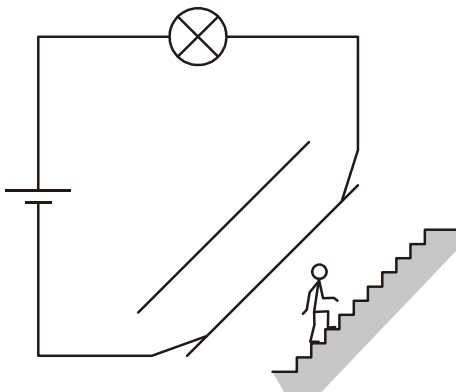
- (b) Give the name of the part that provides energy for the circuit.

.....

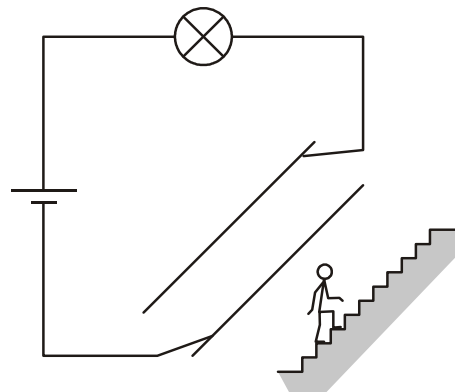
(1 mark)

- (c) The diagrams below show a light-bulb over a staircase of a model house. There is a two-way switch at the bottom of the stairs and another two-way switch at the top.

Under each diagram, tick **one** box to show if the bulb is **on** or **off**. The first one has been done for you.



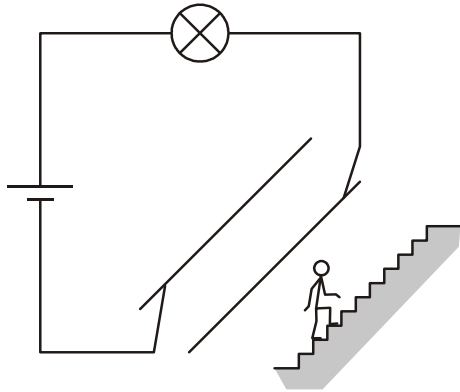
on	<input checked="" type="checkbox"/>
off	<input type="checkbox"/>



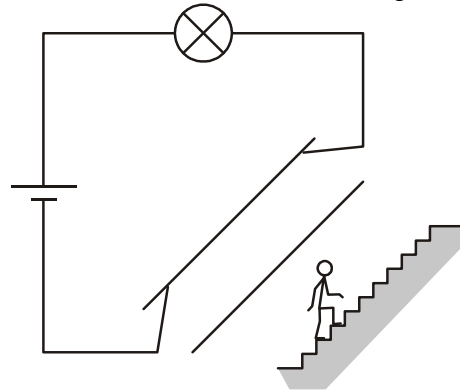
on	<input type="checkbox"/>
off	<input type="checkbox"/>

Name:

Target level:



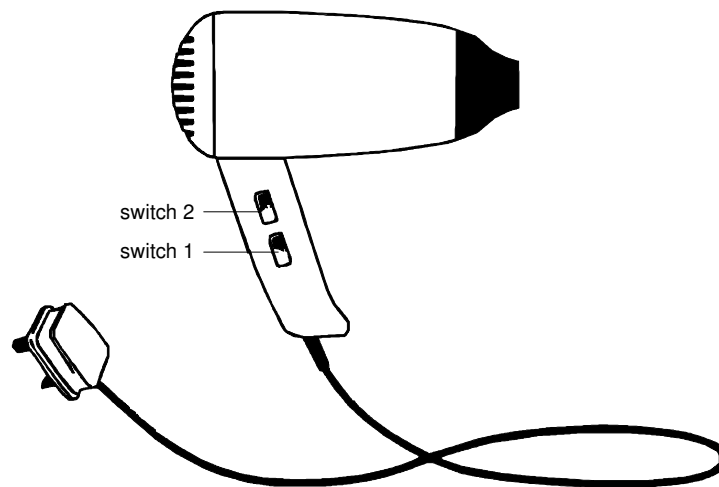
on	
off	



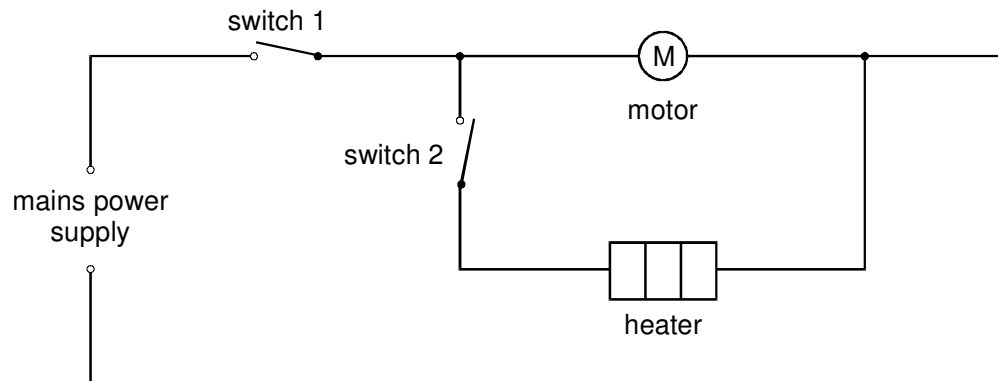
on	
off	

2 marks

3. The drawing shows a hairdryer.



Ben drew the diagram below to show the circuit of the hairdryer.



Name:

Target level:

(a) Which of the switches must be closed for the heater to work? Tick the correct box

switch
1 only

switch
2 only

switches
1 and 2

neither switch
1 nor 2

1 mark

(b) With this circuit, is it possible to have the heater on when the motor is switched off?

.....

Explain your answer.

.....

..... 1 mark

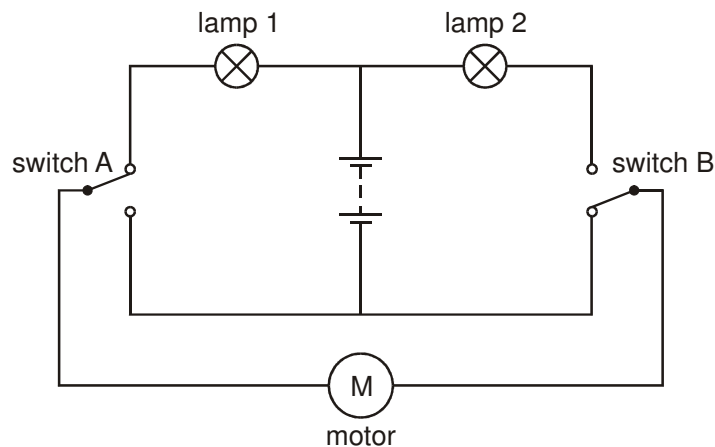
(c) The motor and the heater are both on. The motor blows air through the hairdryer. If the motor breaks, what would happen to the temperature of the hairdryer?

..... 1 mark

(d) The motor and the heater are both on. Suddenly the wire in the heater breaks. What effect, if any, will this have on the motor?

..... 1 mark

4. The diagram shows a circuit for controlling an electric motor.



This circuit can make the motor turn forwards or backwards.

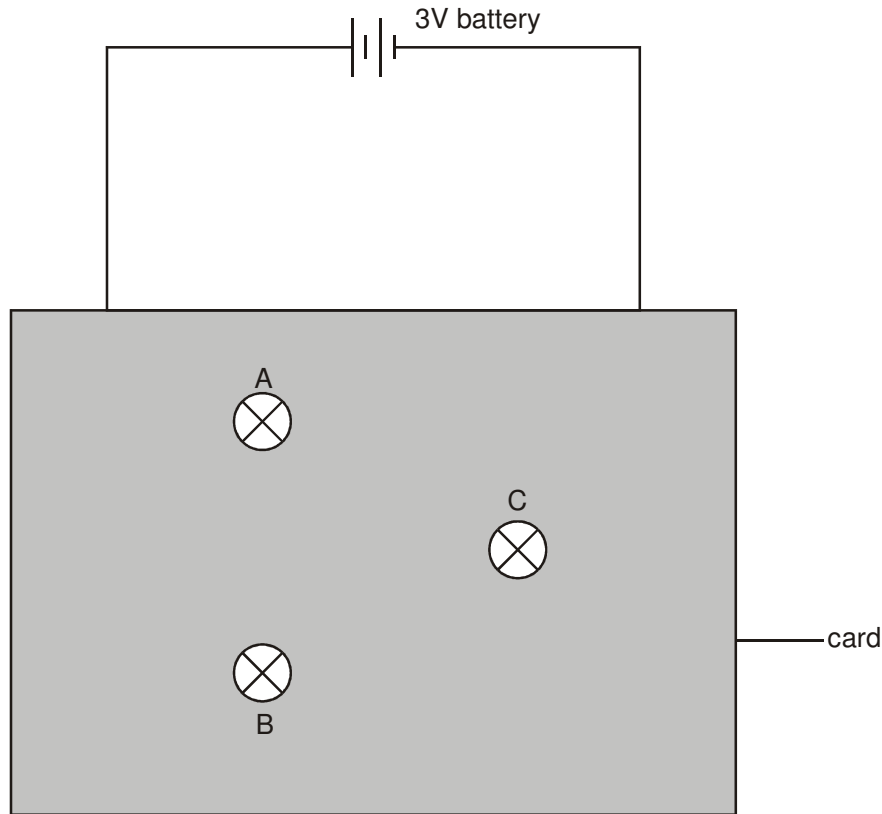
Complete the table. The first row has been done for you. (4 marks)

switch A	switch B	Which lamp, if any, is lit?	In which direction, if any, does the motor turn?
up	down	lamp 1	forwards
up	up		
down	up		
down	down		

Name:

Target level:

5. Imran built a puzzle circuit with three identical bulbs and a 3V battery. He covered the connections to the bulbs with a piece of card as shown below. The bulbs could be seen through holes in the card.



All the bulbs were on but their brightness was different.

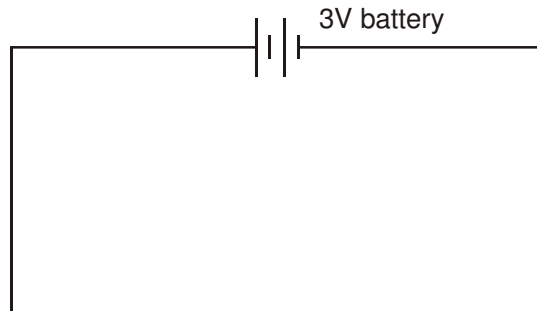
Lucy removed bulbs A, B and C in turn. Before connecting each bulb back into the circuit she observed the effect on the other two bulbs. She recorded her observations in the table below.

bulb removed	observations
A	B and C stayed on
B	C went off A stayed on
C	B went off A stayed on

Name:

Target level:

- (a) Complete the circuit diagram below to show how the three bulbs could be connected. Use your knowledge of series and parallel circuits, and the observations in the table to help you.



2 marks

- (b) Imran used three identical bulbs but their brightness was different. Which bulb was the brightest? Give the letter.

.....

Give the reason for your choice.

.....
.....

1 mark

- (c) Imran added a switch to the circuit so that he could turn all three bulbs on and off at the same time.

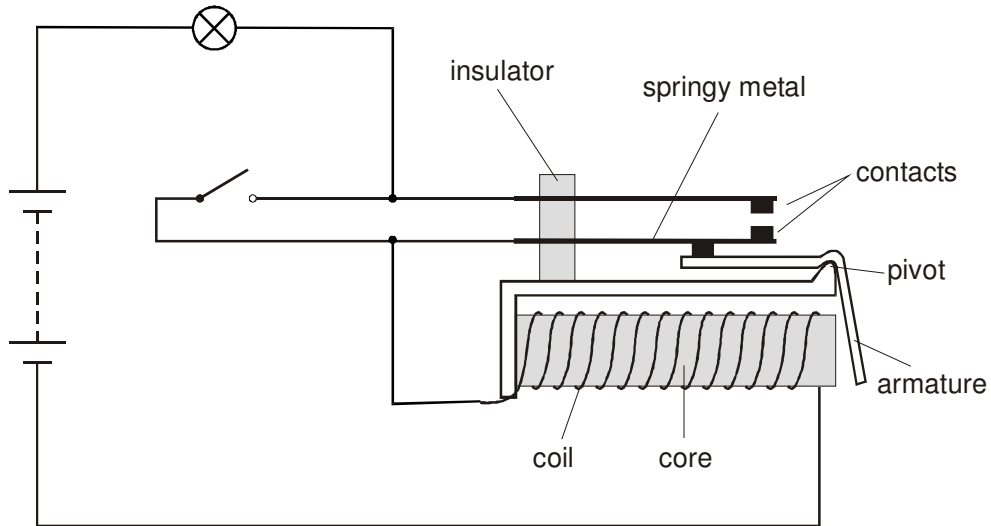
Place a letter **S** on your circuit diagram where this switch could be placed.

1 mark

Name:

Target level:

6. The diagram shows an electromagnetic relay. The relay is connected in a circuit with a battery, a lamp and a switch.



(a) (i) Give the name of a suitable material to use for the core of the electromagnet.
 1 mark

(ii) Give the name of a suitable material to use for the armature.
 1 mark

(b) (i) Explain why the contacts come together when the switch is closed.

 3 marks

(ii) When the switch is now opened, the bulb stays on. Explain why.

 1 mark

Mark	Level
0 – 4	U
5 – 8	3
9 – 12	4
13 – 17	5
18 – 21	6
22 – 27	7

Total marks: / 27

Level: