



## Mark schemes

1

(a) Award **ONE** mark for:

- the wire is not connected/joined;
- the wire should touch the battery.

**Give credit for:**

- *there is a gap;*
- *there is a break in the circuit;*
- *there is no electricity/electric current flowing.*

**Do not give credit for:**

- *it is not being used;*
- *the circuit is wrong.*

1

(b) Award **ONE** mark for:

- the wires should be connected to each end (of the battery/cell);
- the wires are connected to one end (of the battery/cell).

**Give credit for:**

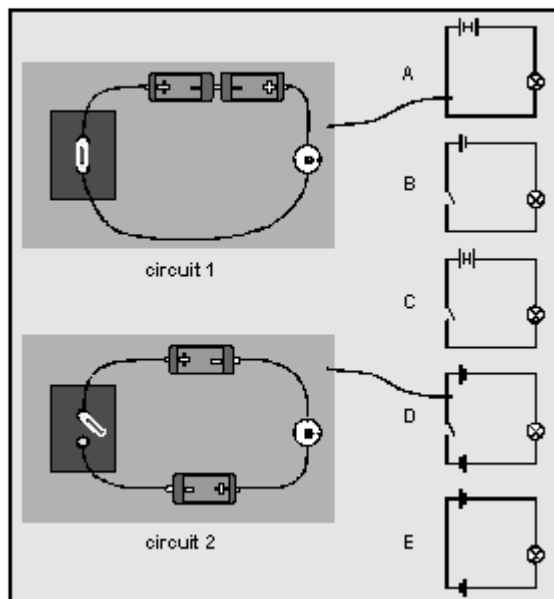
- *there is no electricity/electric current flowing.*

**Do not give credit for:**

- *the wiring is wrong;*
- *not connected properly.*

1

(c) (i)



**Give credit for:**

- any unambiguous link between circuit diagrams and correct circuit.

**NOTE:**

if more than two lines are drawn, deduct **ONE** mark for each incorrect line.

**Do not** award a negative number of marks.

1

(d) Award **ONE** mark for:

- the switch is not closed;
- the paper clip is not touching the drawing pin.

**Give credit for:**

- there is a gap;
- there is a break in the circuit;
- there is no electricity/electric current flowing.

**Do not** give credit for:





- it is not turned on;
- it is not connected;
- it is not being used;
- the circuit is wrong.

1

[5]

2

- (a) Award **TWO** marks for **all three** symbols correctly named:

Circuit symbol	Name of part
	<b>switch</b> .....
	<i>buzzer</i> [given] .....
	<b>bulb/lamp</b> .....
	<b>cell/battery</b> .....

**Do not** give credit for any other electrical component named.

**Do not** give credit for insufficiently naming the bulb:

- *light.*

**Do not** give credit for insufficiently naming the switch:

- *gate.*

2

or

If you are unable to award two marks, award **ONE** mark for **any two** symbols correctly named.

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- (b) (i) Award **ONE** mark for an indication that the switch must be closed/the circuit is closed, e.g.

- close the switch
- check if the switch is closed
- complete/close the circuit.

**ONE** mark may be awarded for:

- *turn the switch on*
- *connect the switch.*

**ONE** mark may be awarded for referring to the name given to the switch in part (a) if incorrect/insufficient, e.g.

- close the gate [if the switch symbol was referred to as 'gate' in a].

**Do not** give credit for an insufficient response, e.g.

- check the circuit is joined up/complete [not enough to check]
- connect the circuit.

**Do not** give credit for an incorrect response where the switch is named incorrectly if this is not the name given to the circuit symbol in part (a), e.g.

- close the gate.

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- (ii) Award up to **TWO** marks for giving **any two** correct responses as indicated below.

Award **ONE** mark for a correct response that refers to adding cells/batteries or increasing the number of cells/batteries, e.g.

- add a battery.

**ONE** mark may be awarded for a reference to decreasing the length of wire in the circuit, e.g.

- use shorter wires.

2

**or**

Award **ONE** mark for a correct response that refers to reducing the number of bulbs/lamps, e.g.

- take away one/both of the lamps/bulbs.

**Give credit** for a correct response that goes beyond the KS2 programme of study, e.g.

- increase the voltage
- use a higher volt battery.

If you are unable to award two marks, award **ONE** mark for **any one** correct response.

**Do not** give credit for an insufficient response implying they will replace the battery with a bigger one, e.g.

- use a bigger battery.

**Do not** give credit for an insufficient response that refers to increasing the power, e.g.

- add more power.

**Do not** give credit for an insufficient response that contradicts the question stem, e.g.

- take away the buzzer.

**Do not** give credit for an insufficient response, e.g.

- make the circuit smaller.

**Do not** give credit for a second response that is a repetition or restatement of the first, e.g.

- 1. remove a bulb  
2. remove another bulb.

1

3

(a) Award **ONE** mark for:

	bulb lights	bulb does not light
steel fork	✓	
plastic comb		✓
wooden spoon		✓
aluminium foil	✓	

[given]

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(b) Award **ONE** mark for recognition of an incomplete circuit with reference to switch:

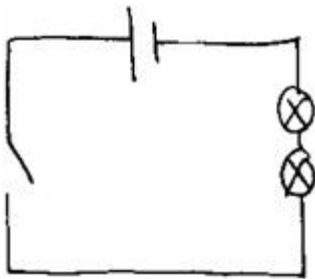
- the circuit is not complete;
- switch isn't on/closed;
- switch is off;
- (paper) clip must touch pins.

**Do not** give credit for:

- *they aren't lit by the switch;*
- *switch isn't working.*

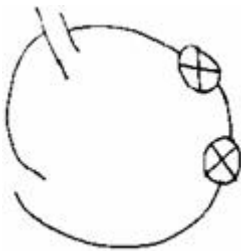
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(c) Award **ONE** mark for a drawn circuit which includes the **FOUR** symbols (in any orientation) and which represents Daniel's circuit:



**Allow:**

- non-rectilinear circuits, eg:



- reversed polarity of battery.

**Do not** give credit for:

- *circuits containing symbols not given in the question;*
- *extra components;*
- *circuit diagrams with gaps of more than 2mm.*

1

[3]

- (a) (i) Award **ONE** mark for recognising that electricity does not travel through plastic:

*The bulb has not lit because the plastic spoon...*

- is an insulator;
- is not a (good) conductor (of electricity);
- stops the electricity flowing;
- does not let electricity through.

**ONE** mark may be awarded for a response suggesting that the circuit would work if the spoon were metal:

*The bulb has not lit because the plastic spoon...*

- *is not metal.*

**Do not** give credit for an insufficient response:

- *is plastic [given];*
- *stops it going through [ambiguous as to what 'it' refers to].*

1(L3)

- (ii) Award **ONE** mark for recognising the switch is open causing a break in the circuit:

*The bulb has not lit because...*

- the switch is open/not closed/off;
- there is a gap/break in the circuit;
- the circuit is incomplete.

**ONE** mark may be awarded for:

*The bulb has not lit because...*

- *the clip is not attached to the pin;*
- *the switch is not connected.*

**Do not** give credit for an insufficient response describing the equipment as faulty:

- *the switch is not right.*

**Do not** give credit for an insufficient response:

- *it is not connected/joined(properly).*

1(L3)

- (iii) Award **ONE** mark for recognising that (the terminals on) one of the cells is the wrong way round:

*The bulb has not lit because...*

- one of the cells is the wrong way round;
- the two positives are together.

**ONE** mark may be awarded for:

*The bulb has not lit because...*

- *the cells are the wrong way round;*
- *the batteries are pointing different ways;*
- *the batteries are pointing toward each other.*

**Do not** give credit for an insufficient response that refers to poles on the cell:

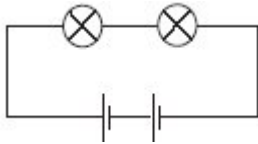
- *the same poles are facing each other [indicates that electricity is being confused with magnetism].*

**Do not** give credit for an insufficient response:

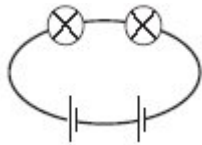
- *the batteries are not connected correctly;*
- *the equipment is faulty;*
- *the cells are facing/pointing the same way.*

**1(L4)**

- (b) Award **ONE** mark for a complete circuit with the symbols correctly drawn [in any order]:



**ONE** mark may be awarded for a non-rectilinear circuit:



**Do not** give credit for a response that includes incorrect science:

- *circuits containing symbols not given or gaps between components of more than 2mm;*
- *circuits with extra/fewer components;*
- *terminals on the cells facing each other;*
- *circuits with incorrectly drawn components, eg:*



**1(L5)**

- (c) Award **TWO** marks for giving **any two** of the following:

- *add more batteries;*
- *use cells with a higher voltage;*
- *use shorter wires;*
- *make two separate circuits with two batteries in each.*

**Give credit** for a correct response that goes beyond the key stage 2 programme of study indicating that wires of less resistance or a parallel circuit could be used:

- use thicker wires;
- use wires of less resistance;
- put the bulbs in a parallel circuit.

2(L5)

**or**

If you are unable to award two marks, award **ONE** mark for giving **one** correct response.

*Marks may be awarded for:*

- add another/an extra cell;
- use stronger/more powerful/new batteries;
- re-charge the cells;
- make the circuit smaller/shorter.

**Do not** give credit for an insufficient response indicating that a bulb may become brighter if the other one is removed:

- take one bulb away;
- have only one bulb.

**Do not** give credit for an insufficient response:

- use a bigger/different cell  
[does not indicate an increase in voltage];
- use two cells;
- use a new bulb [both existing bulbs must be brighter];
- use different wires/change the wires;
- use smaller wires [is ambiguous as to whether this is shorter or thinner, the latter of which is incorrect];
- use fewer/less wires [each wire could be longer].

**Do not** give credit for a second response that is a restatement or repetition of the first.

1

[6]