Physics

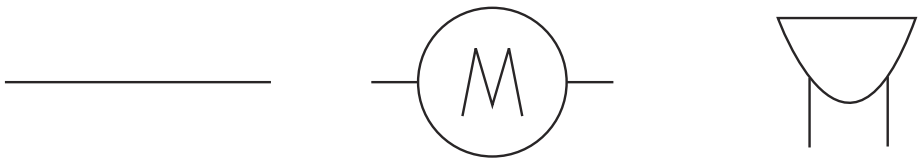
KS3

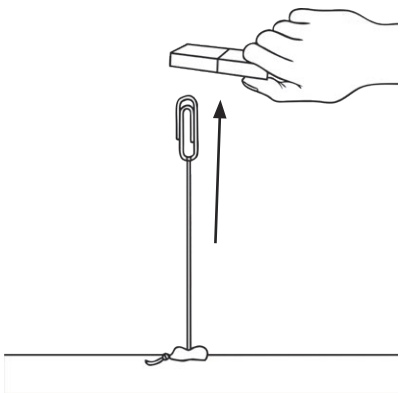
Electricity

F

Foundation Tier

Mark Scheme (50 marks)

<table>
<tr><th>1</th><th>Answer</th><th>Marks</th></tr>
<tr><td>(a)</td><td> 
wire motor buzzer</td><td>(3)</td></tr>
<tr><td>(b)</td><td>i) The bulb is not lit.
ii) The bulb is lit.
iii) The bulb is not lit.
iv) The bulb is lit.</td><td>(4)</td></tr>
<tr><td>(c)</td><td>They will know if the object will conduct electricity as the bulb will light up/the object is a conductor which allows electricity to pass through it.</td><td>(1)</td></tr>
<tr><td>(d)</td><td><table><tr><th>Object</th><th>Does the Object Conduct Electricity?</th></tr><tr><td>coin</td><td>✓</td></tr><tr><td>wooden spoon</td><td></td></tr><tr><td>rubber</td><td></td></tr><tr><td>brass pin</td><td>✓</td></tr><tr><td>paperclip</td><td>✓</td></tr></table></td><td>(3)</td></tr>
<tr><td>Total</td><td></td><td>(11)</td></tr>
</table>

2	Answer	Marks
(a)		**(1)**
(b)	The paperclip remains in the air. [ ] The paperclip falls to the table. [✓] The paperclip is repelled. [ ]	**(1)**
(c)	rubber [ ] plastic pen [ ] steel pin [✓] wooden matchstick [ ]	**(1)**
(d)	The magnet moves away as it is being repelled by the other magnet.	**(1)**
(e)	When the north poles of two magnets are held together, we say that the magnets **repel** one another. When the south pole of one magnet is held close to the north pole of another magnet, we say that the magnets **attract** one another.	**(2)**
Total		**(6)**

<table>
<tr><th>3</th><th>Answer</th><th>Marks</th></tr>
<tr><td>(a)</td><td>Students' answers may vary and they may have more or fewer steps. Their answer should comprise of the steps below:

Step 3 – Attach the opposite end of each wire onto the power pack.

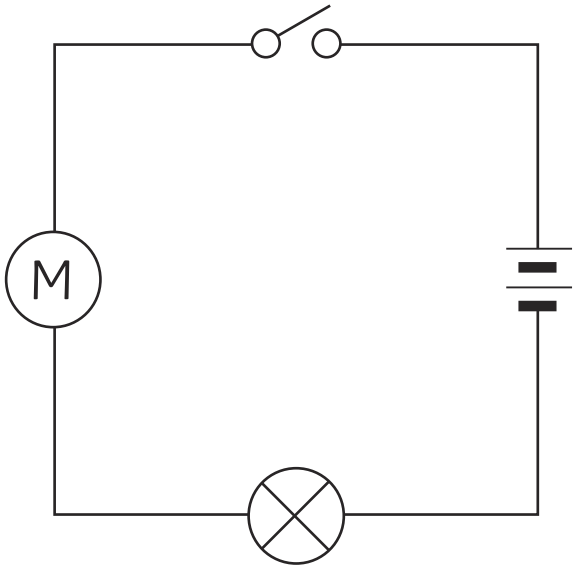
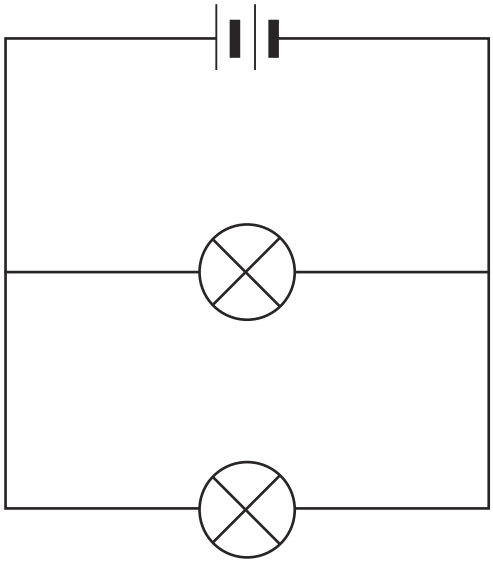
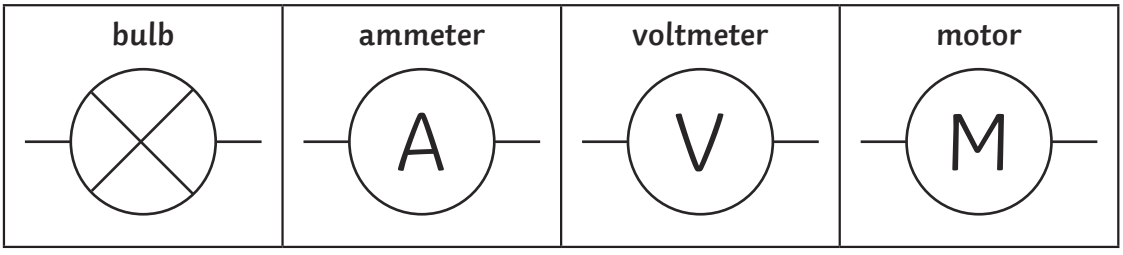
Step 4 – Wrap the copper wire around the nail until you reach the required number of coils. Use a pair of wire strippers to remove some of the insulation. Leave 2cm of exposed wire at each end of the copper wire.

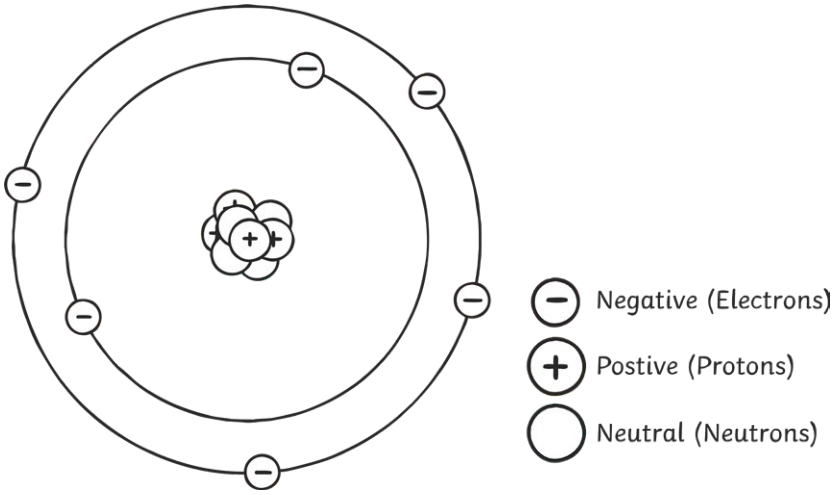
Step 5 – Attach the crocodile clips to the exposed wire.

Step 6 – Lay the paperclips on the bench and hold the insulated wire on either side of the nail.

Step 7 – Hover the nail over the paperclips.

Step 8 - Record, in your table, how many paperclips are attracted to the nail.</td><td>(6)</td></tr>
<tr><td>(b)</td><td><table><tr><td>independent</td><td>This is the variable that we change.</td></tr><tr><td>dependent</td><td>This is the variable that we measure.</td></tr><tr><td>control</td><td>This is the variable that we keep the same.</td></tr></table></td><td>(3)</td></tr>
<tr><td>(c)</td><td>When electrical charges flow in a wire, a magnetic field is formed around the wire. The larger the current, the stronger the magnetic field will be. When a current stops flowing, there is no magnetic field.</td><td>(5)</td></tr>
<tr><td>Total</td><td></td><td>(14)</td></tr>
</table>

4	Answer	Marks
(a)		(2)
(b)		(2)
(c)		(4)
Total		(8)

5	Answer	Marks
(a)	Protons have a **positive** charge.	**(1)**
(b)	Neutrons have a **neutral** charge.	**(1)**
(c)	Electrons have a **negative** charge.	**(1)**
(d)		**(3)**
Total		**(6)**

6	Answer	Marks
(a)	When the cloth rubs against the insulator, electrons are transferred from the cloth to the insulator. The insulator gains electrons and so becomes negative.	**(2)**
(b)	Students may mention any three of these: 1. Petrol tankers travelling on the roads. 2. Using a mobile phone on a petrol station forecourt. 3. Cleaning an oil tanker. 4. Dust attracted to insulators e.g. the TV screen. 5. Clothes made from synthetic clothing cling to each other.	**(3)**
Total		**(5)**