

**The motor effect – Mark scheme**

1.	<p>(a) electric drill, electric fan, electric food mixer and electric screwdriver <span style="float: right;">2</span>  <i>all four ticked and no others (2)</i>  <b>either</b> all four of these ticked and only one other (1)  <b>or</b> any three of these ticked and none/one/two of the others (1)</p> <p>(b) (i) reverse (the direction of the) current (1) <span style="float: right;">2</span>  <b>or</b> reverse the connections (to the battery)                  reverse (the direction of the) magnetic field (1)  <b>or</b> reverse the (magnetic) poles /ends                  do <b>not</b> credit 'swap the magnets (around)'</p> <p>(ii) any <b>two</b> from: <span style="float: right;">2</span></p> <ul style="list-style-type: none"> <li>• increase the strength of the magnet(s)/(magnetic) field do <b>not</b> credit 'use a bigger magnet'</li> <li>• increase the current allow: 'increase the voltage/p.d.'; add cells/batteries increase the (electrical) energy; increase the power supply; allow 'decrease the resistance'; 'increase charge'; allow 'increase the electricity' do <b>not</b> credit 'use a bigger battery'</li> <li>• reduce the gap (between coil/armature and poles/magnets) allow increase the (number of) coils</li> <li>• increase the turns (on the coil/armature) do <b>not</b> credit 'use a bigger coil'</li> </ul>
<b>[6]</b>	
2.	<p>(a) current flows <span style="float: right;">4</span>                  coil / core magnetised / electromagnet activated / energised / turned on                  attracts iron bar                  causing bolt to be pulled out  <i>each for 1 mark</i></p> <p>(b) more turns <span style="float: right;">2</span>                  bigger current / e.m.f                  softer iron core <span style="float: right;"><i>any two for 1 mark each</i></span></p> <p>(c) to relock door / return iron bar / to lock door <span style="float: right;">1</span>  <i>for 1 mark</i></p> <p>(d) iron bar would still be attracted / coil still magnetised so still works <span style="float: right;">2</span>  <i>for 1 mark each</i></p> <p>yes + wrong answer <span style="float: right;"><i>0 marks</i></span></p> <p>yes + current still flows <span style="float: right;"><i>1 mark</i></span></p> <p>yes + still magnetised / iron bar still attracted <span style="float: right;"><i>2 marks</i></span></p>
<b>[9]</b>	