
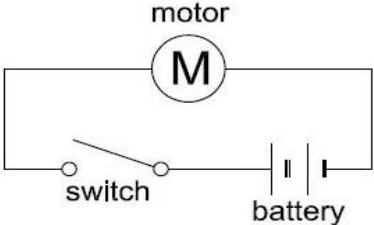




Brush Monsters Worksheet – Suggested Answers

<p>Science: Electricity</p>	
<p>Name the electrical parts (components) used in your circuit.</p>	<p>Motor Switch Cells (a battery consists of two or more cells) Battery holder & snap battery connector Battery Crocodile leads (or wires)</p>
<p>Draw your circuit using these circuit symbols, and using lines to represent the wires. Label the components.</p> 	
<p>What will happen if you leave the circuit switched on for a long time?</p>	<p>You will drain the battery.</p>
<p>Why do you need to attach the crocodile clips onto bare metal, not onto plastic insulation?</p>	<p>The plastic is an insulator which prevents the current from passing. The bare metal ends are good conductors of electricity, so the current can pass through.</p>
<p>What could happen if you short circuit your battery? (A short circuit allows the electricity to flow round with very little resistance. For example if you accidentally connect your battery wires together instead of connecting via the motor.)</p>	<p>You could drain the battery quickly and possibly melt your battery holder and burn your fingers.</p>

Science: Forces	
Why do you need an offset hole in your eraser, instead of a central one?	The eraser is offset so that the centre of gravity moves up and down (and from side to side) as the motor rotates. This is what makes the brush vibrate.
Design and Technology	
What joining methods did you use to create your brush monster?	<p>The eraser was a tight push fit on the motor shaft.</p> <p>The motor was clipped into the motor mount.</p> <p>The crocodile leads were clipped onto the electrical terminals.</p> <p>The motor mount was attached to the brush with a foam sticky pad.</p> <p>All electrical components were attached firmly to the brush using cable ties.</p> <p>The decorations were glued on.</p> <p>The foam sheet was self-adhesive.</p>
Engineering	
What would happen if the eraser is pushed up against the end of the brush? How could you fix this?	<p>The eraser would jam against the brush and not be able to rotate. This often happens!</p> <p>You could slide the motor forwards a little in its mount to give a gap between the eraser and the brush.</p> <p>You could not push the eraser as far onto the motor shaft.</p>
Maths	
What was the average speed of your brush monster? (Average speed = total distance / time)	
Extension questions	
Does the brush monster work on carpet? Explain your findings.	The brush monster only works properly on a smooth surface; the bristles get caught in the carpet and prevent it moving.
If you wanted to make a faster brush monster, what would you change?	You could use a bigger offset on the eraser, a lighter brush, one with stiffer bristles, one with more sloping bristles, more batteries, less decorations, a sloping race track...