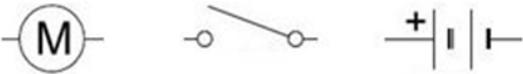
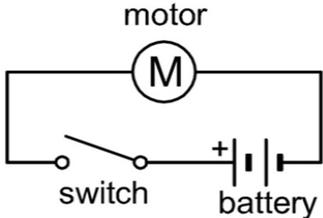


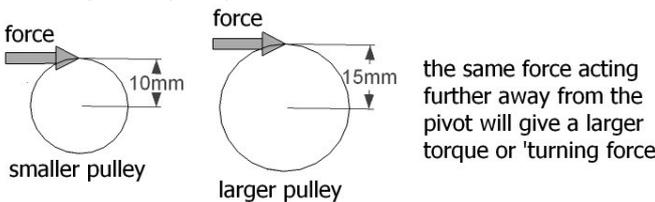
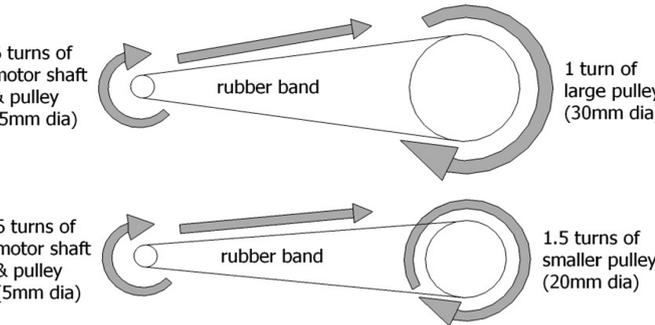
<p>Name these electrical parts:</p> 	<p>Motor, switch and battery</p>
<p>Draw your circuit using these circuit symbols, and using lines to represent the wires. Label the components.</p> 	
<p>Is metal an insulator or a conductor?</p>	<p>A conductor</p>
<p>Is plastic an insulator or a conductor?</p>	<p>An insulator</p>
<p>What could happen if you short circuit your battery?</p>	<p>You could heat up or melt your battery holder and possibly burn your fingers.</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>If you measure the time T taken to travel a known distance D, how do you calculate the average speed?</p>	<p>Average speed = distance D / time T</p>
<p>Which of your items are acting as bearings?</p>	<p>The plastic straws</p>
<p>Why does the pulley need to be a tight fit on the axle?</p>	<p>It needs to be a tight fit so that when the pulley is driven the axle turns. Otherwise it will slip.</p>



Motorised Vehicle Worksheet

continued



<p>Why do the wheels need to be a tight fit on the axles?</p>	<p>The wheels need to be a tight fit so that when the axle turns the wheels also turn.</p>
<p>If your vehicle goes backwards what can you change to make it go forwards?</p>	<p>You can swap over the crocodiles attached to the two motor terminals.</p>
<p>Which goes faster, a vehicle with a larger driven pulley or one with a driven smaller pulley?</p>	<p>A vehicle with a smaller driven pulley goes faster (unless it is trying to go so fast that the wheels slip on the ground or the motor stalls and won't go round.)</p>
<p>Which goes up steeper slopes, a vehicle with a larger pulley or one with a smaller pulley?</p>	<p>A vehicle with a larger pulley goes up steeper slopes (as long as the wheels grip the slope).</p>
<p><u>Extension questions</u></p>	
<p>Why do cars have rubber tyres?</p>	<p>It helps them grip the road better, by increasing the friction between the wheels and the road. This is particularly important when braking, going round corners, accelerating and going up hill.</p>
<p>If you were cycling up a steep hill would you choose a gear which gives you low speed and high torque ('turning force') or high speed and low torque?</p>	<p>Low speed and high torque.</p>
<p>Explain why the size of the pulley affects the hill climbing ability of your vehicle.</p> 	<p>With a larger driven pulley the speed is lower but the torque ('turning force') is higher, which enables you to get up the hill.</p>
<p>Explain why the size of the pulley affects the speed of your vehicle.</p> 	<p>If the motor shaft and the rubber band were going at the same speed, the smaller pulley would have to turn faster than the large pulley; otherwise the rubber band would slip on the pulley. If the smaller pulley turns faster then the driven axle (and hence the wheels) turns faster, so the vehicle goes faster.</p>