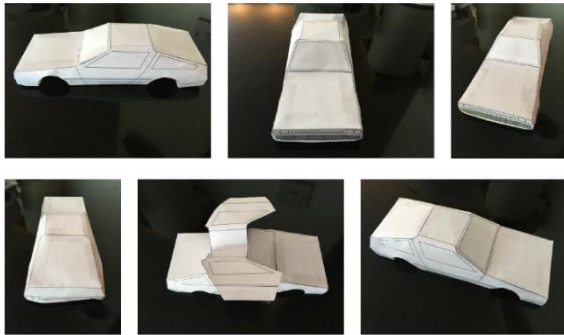


Year 6

Year 6 had the challenge of researching and designing moving cars. Children were asked to look at what is currently on the market as inspiration for shell designs, and considered materials logos for their cars. They had to show understanding of scientific circuits which would ensure a car could move using a motor and represent this as a diagram using the correct symbols. They also had to consider pitfalls that may occur and how to overcome them.

Paper Prototype Model



THE SLICER Tech Specs

Draw these essential parts	Motor, Switch, Battery.	Why do the wheels need to be a tight fit on the axles?	So they don't slip apart.
<p>Draw your circuit using these circuit symbols, and using lines to represent the wires. Label the components.</p>		<p>If your buggy goes backwards what can you change to make it go forwards?</p>	<p>Like Motor.</p>
<p>Which goes faster, a buggy with a larger pulley or one with a smaller pulley?</p>		<p>Which goes faster, a buggy with a larger pulley or one with a smaller pulley?</p>	<p>Smaller.</p>
<p>Is there an insulator or a conductor?</p>	<p>Conductor.</p>	<p>Why do cars have rubber tyres?</p>	<p>To grip onto the road.</p>
<p>Is there an insulator or a conductor?</p>	<p>Insulator.</p>	<p>If you were cycling up a steep hill would you choose a gear which gives you the speed and high torque (turning force) or high speed and low torque?</p>	<p>You speed and high torque.</p>
<p>What could happen if you short circuit your battery?</p>	<p>It could heat your hand.</p>	<p>Explain why the size of the pulley affects the hill climbing ability of your buggy.</p>	<p>The larger pulley gives you more torque but more speed.</p>
<p>What will happen if you leave the circuit switched on for a long time?</p>	<p>It will get very hot.</p>	<p>Explain why the size of the pulley affects the speed of your buggy.</p>	<p>The larger pulley gives you more torque but more speed.</p>
<p>If you measure the time T taken to travel a known distance D, how do you calculate the average speed?</p>	<p>$\text{Speed} = \frac{D}{T}$</p>	<p>Why does the pulley need to be a tight fit on the axle?</p>	<p>So it can grip the string.</p>
<p>Which of your items are acting as levers?</p>	<p>Rubber band.</p>		

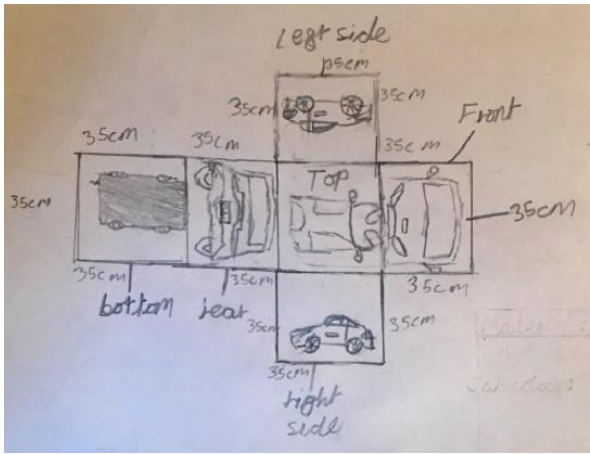
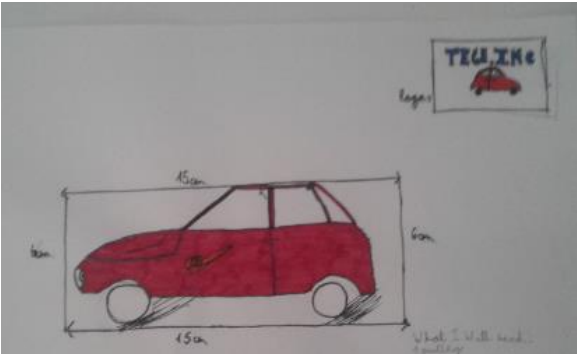
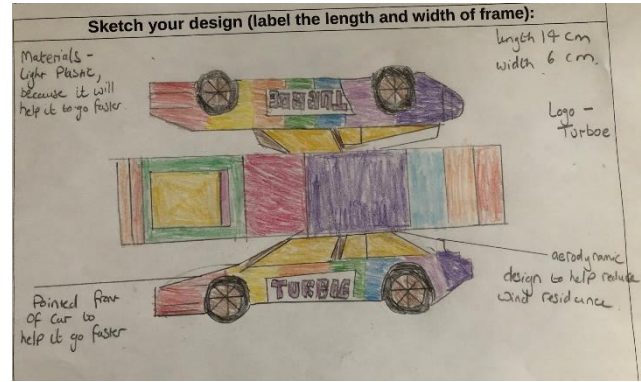
Year 6 had to use their knowledge about belt and pulley systems from their work in Year 5 when they made moving fairground rides.

Explain why the size of the pulley affects the hill climbing ability of your buggy.

If the pulley is bigger, then the rim force is bigger. This helps climbing steep hills. (Note, I tried not to copy the answer)

Explain why the size of the pulley affects the speed of your buggy.

If the larger pulley is turned once, because the diameter is six times as big as that of the motor shaft, the motor shaft will have to turn six times. The larger pulley has more torque, whereas the motor shaft is faster.



Why do the wheels need to be a tight fit on the axles?	It won't go otherwise, and the wheels will come off.
If your buggy goes backwards what can you change to make it go forwards?	The motor needs to go the other way. Change the wires.
Which goes faster, a buggy with a larger pulley or one with a smaller pulley?	A buggy with a smaller pulley.
Which goes up steeper slopes, a buggy with a larger pulley or one with a smaller pulley?	A buggy with a larger pulley.
Extension questions	
Why do cars have rubber tyres?	They keep the car on the road, by stopping it slipping.
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?	High speed and low torque. Low speed and high torque.
Explain why the size of the pulley affects the hill climbing ability of your buggy.	If the pulley is bigger then it can give a better force to the wheels with help the wheels overcome the force of gravity going up a hill.
Explain why the size of the pulley affects the speed of your buggy.	A smaller pulley goes round more times than a larger pulley compared to the pulley on the motor.