

Curriculum Summary

Subject: Resistant Materials and Engineering

Year 7	Year 8	Year 9	Year 10	Year 11
<p>Mechanical Toy: Students explore creative design, woodworking skills, cam and mechanisms to design, make and evaluate a mechanical toy.</p>	<p>LED Circuits: Students assemble an LED circuit to produce a lamp inspired by the pop art movement.</p>	<p>The Engineering Sector: Students learn to appreciate the importance of design and engineering in society, including engineering achievements, disciplines, and interconnections.</p>	<p>Aluminium: Students interpret working drawings to produce an aluminium bevel square and coat hook. They learn to safely use the pillar drill, centre lathe and milling machine.</p>	<p>Interpreting Drawings: Students interpret given engineering drawings to produce product components.</p>
		<p>Steady Hand Game: Students investigate electronics theory, electronic printed circuit board production, vacuum formed casing design and product assembly skills.</p>	<p>Engineering Design: Students improve the design of an existing calculator and torch to the final concept stage using the design process.</p>	<p>Production Processes: Students plan engineering production of a wind turbine including risk assessment.</p>
		<p>Structures: Students investigate how frameworks and triangulation can be used to produce rigid structures. They develop teamworking skills. Students test cantilever prototypes to destruction.</p>	<p>Students analyse existing engineered products and generate feasible design solutions which meet specifications.</p> <p>They produce technical details of a final concept to an industrial standard using CAD software.</p>	<p>Producing a Product: Students explore how to work within the tolerances of set engineering drawings. They produce a complex product following Gantt chart timings. Students undertake quality control analysis tasks. They evaluate the completed outcome.</p>
	<p>Mild Steel Memo Holder: Students sketch isometric ideas. They safely cut, shape and fabricate mild steel.</p>	<p>External Engineering Competition: Students generate ideas in response to a brief set by an international engineering organisation.</p>	<p>Aluminium Casting and Mild Steel: Students cast aluminium and learn about drilling, screw thread cutting, centre lathe work, riveting and fettling.</p>	
		<p>CAD/CAM: Students develop CAD skills to produce 3D printed components.</p>	<p>Wasting, Shaping and Assembling: Students produce a screwdriver using aluminium rod and silver steel. They learn about metal hardening and tempering, aluminium taper turning and knurling on the centre lathe.</p>	
		<p>Engineering Drawing: Students interpret and produce orthographic, isometric, exploded and sectional drawings.</p>		
		<p>Mild Steel: Students design and safely producing a trinket holder using mild steel. They develop steel shaping and spot-welding skills.</p>		<p>Solving Engineering Problems: Students explore engineering achievements and developments. They investigate properties of materials for engineering products.</p>