

## Key Stage 3 Overview: Design and Engineering Year 8

	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
<b>Year 8</b>	<p><b>University Challenge:</b></p> <p>I'm an Engineer - get me in here</p> <p><b>Context:</b> Focus on technical drawings:</p> <ul style="list-style-type: none"> <li>- Importance planned to dimensions</li> <li>- Planned view and Assembly methods</li> </ul> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Reading technical drawings.</li> <li>• Completing existing orthographic views with missing views/lines/dimensions.</li> <li>• Produce technical drawing of various objects/selections.</li> <li>• Using CAD to produce drawing (All views) of object that fits into Assembly/Template JIG.</li> <li>• Measuring existing components and drawing design based on recorded measurement.</li> </ul>	<p><b>University Challenge:</b></p> <p>Theatre</p> <p><b>Context:</b> Electric Powered Vehicles</p> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Researching electric motor specifications, reading technical data and interpreting for a specific project/need.</li> <li>• Calculating gear ratios, torque and RPM</li> <li>• Designing concepts of vehicles, side views and corresponding factors using aerodynamics and material selection</li> <li>• Making and assembling chassis of electric powered vehicle using</li> </ul>	<p><b>University Challenge:</b></p> <p>Recycling</p> <p><b>Context:</b> Challenge of being much more efficient with material making. Outcome: Making object out of cardboard, sustainable materials.</p> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Use of strategic marking out of component on material.</li> <li>• Effective use of including all components on blanking plate of material before cutting.</li> <li>• Use of strategic cutting out – looking at line path numbers of cut – short straight compared to long wavy.</li> <li>• Comparison of materials.</li> <li>• Packing of design for items – looking</li> </ul>	<p><b>University Challenge:</b></p> <p>Brunel Museum</p> <p><b>Context:</b> Looking at tunnels &amp; how they are made. Outcome – To build a tunnel to withstand external forces.</p> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Investigating tunnel structures.</li> <li>• Identifying &amp; explaining the different forces that are acting on a tunnel.</li> <li>• Comparing different types of tunnels/bridges.</li> <li>• Test/prototype of a tunnel structure using Quick/Rough methods of making/materials.</li> <li>• Looking at different shales/profiles for tunnels. Circular – compared to Rectangular. Identifying strengths/weaknesses.</li> <li>• Final build of tunnel using robot materials structural integrity through making, cutting/measuring/finishing skills.</li> </ul>	<p><b>University Challenge:</b></p> <p>Extreme Re-Design</p> <p><b>Context:</b> Taking certain objects or products from set selection to redesign.</p> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Investigating current function of a product looking into at its performance.</li> <li>• Measuring performance against existing specifications.</li> <li>• Identifying a particular function/attribute as a target to improve.</li> <li>• Sketching annotating a redesign of current component/object.</li> <li>• Making skills cutting, finishing to make redesigned object/component.</li> </ul>	<p><b>University Challenge:</b></p> <p>Community</p> <p><b>Context:</b> Building/making a range of objects. Utilising skills learnt in Year 8. Produce 3-4 objects to sell using Digital engineering techniques.</p> <p><b>Skills:</b></p> <ul style="list-style-type: none"> <li>• Going through design process – Researching existing solutions to design problem.</li> <li>• Brainstorm – Concept development/mind map for project.</li> <li>• Sketching/CAD work using CAD to make 3D Model.</li> <li>• Manual/Digital Engineering methods to make enhanced final product.</li> <li>• Use of CAD system to produce multiple</li> </ul>

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		<p>standard components and custom designed components</p> <ul style="list-style-type: none"> <li>• Testing performance of vehicle against race criteria &amp; evaluating against specification.</li> </ul>	<p>at reducing waste/area.</p> <ul style="list-style-type: none"> <li>• Use of iPhone/iPad packaging over years as a case study.</li> </ul>	<ul style="list-style-type: none"> <li>• Looking at external case studies – cross rail tunnelling.</li> </ul>		<p>set/numbers of product.</p> <ul style="list-style-type: none"> <li>• Investigating Mass Methods of Production Manufacturing.</li> </ul>
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