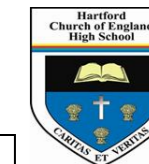


# Long Term Plan Y10 BTEC Engineering Design



**Intent / End Point:** In Year 10 pupils will learn about the requirements of design briefs and design specifications for the development of new products. They will learn about the Design Cycle and how this is used as a framework to ensure successful product design. They will then learn how to carry out detailed product analysis and research, investigating how commercial production methods and manufacturing processes impact on product design.

	<u>Year 10 - HT1</u>	<u>Year 10 - HT2</u>	<u>Year 10 - HT3</u>	<u>Year 10 - HT4</u>	<u>Year 10 - HT5</u>	<u>Year 10 - HT6</u>	
<u>Unit title</u>	<u>R105 Design Briefs &amp; Specifications</u>	<u>R105 Design Briefs &amp; Specifications</u>	<u>R105 Design Briefs &amp; Specifications</u>	<u>R106 Product Analysis &amp; Research</u>	<u>R106 Product Analysis &amp; Research</u>	<u>R106 Product Analysis &amp; Research</u>	
<b>Principles that underpin the curriculum</b>	<b><u>Knowledge</u></b>	Understanding the design cycle and the relationship between design briefs and design specifications <ul style="list-style-type: none"> <li>• The design cycle</li> <li>• Life cycle assessment</li> <li>• Identification of user needs</li> <li>• Manufacturing processes</li> </ul>	Understand the requirements of design specifications for the development of a new product. <ul style="list-style-type: none"> <li>• Aesthetics &amp; ergonomics</li> <li>• Product requirements</li> <li>• Manufacturing considerations</li> <li>• Production costs</li> <li>• Regulations and safeguards</li> </ul>	Know about the wider influences on the design of new products <ul style="list-style-type: none"> <li>• Market forces</li> <li>• Legislative design requirements</li> <li>• Sustainable design</li> <li>• New and emerging technologies and materials</li> <li>• Environmental pressures</li> </ul>	Know how commercial production methods, quality and legislation impact on the design of products and components <ul style="list-style-type: none"> <li>• Commercial production methods</li> <li>• The impact of manufacturing process on product design</li> <li>• The importance of conforming to standards</li> </ul>	Being able to research existing products <ul style="list-style-type: none"> <li>• Research methods used to inform product analysis</li> <li>• Strengths and weaknesses of existing products</li> <li>• Methods used to summarise research findings</li> <li>• (R105 resits and revision)</li> </ul>	Being able to analyse an existing product through disassembly <ul style="list-style-type: none"> <li>• The use of sources and procedures for disassembly</li> <li>• Using appropriate tools for disassembly</li> <li>• Analysing an existing product through disassembly</li> </ul>
	<b><u>Design Communication</u></b>					<ul style="list-style-type: none"> <li>• Analysing existing products</li> <li>• Graphical communication of research outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Labelling &amp; annotation of disassembly plan</li> <li>• Creating a step by step guide using photos</li> </ul>
	<b><u>Design Realisation</u></b>				<ul style="list-style-type: none"> <li>• Manufacture using Injection Moulding</li> </ul>		
<b>Middle Stake Testing</b>	<u>Theory Test 1</u>	<u>Theory Test 2</u>	<u>Practice Exam</u>	<u>Theory Test</u>	<u>R106 pre-hand in assessment</u>		
<b>High Stake Testing</b>			<u>Formal R105 Examination</u>		<u>R106 test</u>	<u>R106 submission</u>	
<b>Skills development</b>	Pupils will develop their research skills when looking into manufacturing processes and investigating products that have used these. They will also improve their analysis skills when summarising their research into a graphical format and drawing conclusions from these.						

# Long Term Plan Y11 Btec Engineering Design

<b>Intent / End Point:</b> In Year 11 pupils will focus on the techniques used to communicate design proposals using both hand drawing and computer aided design. They will then develop plans to successfully manufacture a high quality prototype.							
	<u>Year 11 - HT1</u>	<u>Year 11 - HT2</u>	<u>Year 11 - HT3</u>	<u>Year 11 - HT4</u>	<u>Year 11 - HT5</u>	<u>Year 11 - HT6</u>	
<u>Unit title</u>	R107 Developing & presenting engineering designs	R107 Developing & presenting engineering designs	R107 Developing & presenting engineering designs	R108 3D Design realisation	R108 3D Design realisation	R106 3D Design realisation	
<b>Principles that underpin the curriculum</b>	<u>Knowledge</u>	Be able to generate design proposals using a range of techniques <ul style="list-style-type: none"> <li>• Annotation and labelling techniques</li> <li>• Use of IT software to produce, modify and enrich design proposals</li> </ul>	Develop designs using engineering drawing techniques <ul style="list-style-type: none"> <li>• 3D Engineering drawings</li> <li>• 2D Engineering drawings</li> </ul>	Be able to use CAD to produce and communicate design proposals <ul style="list-style-type: none"> <li>• Solid modelling</li> <li>• Parts</li> <li>• Assemblies</li> <li>• Rendering and animation</li> </ul>	Know how to plan the making of a prototype <ul style="list-style-type: none"> <li>• Interpreting a specification</li> <li>• Use of planning tools</li> <li>• Planning stages</li> </ul>	Understand and implement appropriate and safe working practices when manufacturing a prototype <ul style="list-style-type: none"> <li>• Generating risk assessments</li> <li>• Identifying &amp; managing hazards</li> <li>• Use of PPE</li> </ul>	Be able to produce a prototype <ul style="list-style-type: none"> <li>• Selection of materials &amp; tools</li> <li>• Assemble methods</li> <li>• Recording manufacture</li> </ul> Be able to evaluate a prototype <ul style="list-style-type: none"> <li>• How to evaluate the prototype</li> <li>• How to evaluate your performance</li> </ul>
	<u>Design Communication</u>	<ul style="list-style-type: none"> <li>• Freehand sketching</li> <li>• Rendering for tone and texture</li> <li>• Annotation and labelling</li> </ul>	<ul style="list-style-type: none"> <li>• Isometric</li> <li>• Oblique</li> <li>• Orthographic</li> <li>• Annotation &amp; Labelling</li> </ul>	<ul style="list-style-type: none"> <li>• 2D &amp; 3D modelling</li> </ul>	<ul style="list-style-type: none"> <li>• Flowcharts</li> <li>• Gantt charts</li> </ul>	<ul style="list-style-type: none"> <li>• Risk assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Manufacturing diary</li> </ul>
	<u>Design Realisation</u>			<ul style="list-style-type: none"> <li>• 3D printed product</li> </ul>			
	<u>Middle Stake Testing</u>	Design Task – Initial Ideas	Drawing exam	Computer aided Design task	Pre-Production planning gantt chart	Quality control task	Completed prototype
<u>High Stake Testing</u>			<b>R107 Submission</b>			<b>R108 Submission</b>	
<u>Skills development</u>	Pupils will improve their design presentation skills by learning a range of drawing techniques. They will also improve their planning skills by generating planning aids like flowcharts and gantt charts. Finally, they will focus on their making skills by producing a high quality prototype using hand tools and machinery.						