


<p><b>Year: 13</b> <b>Subject: Product Design</b></p>	<p><b>Curriculum Intent:</b> Students will build upon the skills and activities that they learned in Year 12, reinforcing their practical and theoretical knowledge. This is achieved through their NEA, theory based lessons and homework. Students will explain and discuss their understanding of what they have read, observed, and practiced justifying the methods and techniques used through their NEA coursework. Their knowledge will be tested through 'POP' tests and their PPE examinations.</p>					
	<p><b>Term 1</b></p>		<p><b>Term 2</b></p>		<p><b>Term 3</b></p>	
<p><b>Topic Titles (in order of delivery)</b></p>	<p>1. NEA NEA - Reviewing Section A and B  NEA – Writing a design specification using research.  Theory – drawing techniques – isometric, orthographic.  Strategies for coming up with ideas – using existing products, merging ideas, natural forms etc.  NEA – initial ideas  NEA – importance of annotation and linking initial ideas to design specification  NEA – development of ideas</p>	<p>2. NEA 3. Preparation for the PPE's  NEA – final developed design – refer annotation back to the specification highlighting innovation and creativity in the ideas. Make links back to the research completed.  NEA – Final isometric design using CAD for presentation. Annotation to include links back to specification.  NEA – Final orthographic design. Measurements must be accurate and realistic – informed from modelling.</p>	<p>1. Review of PPE's 2. NEA  NEA – ordering of materials – marking out and double checking before cutting. Anything that involves CAM – 2D design/Fusion 360.  NEA – manufacturing the product, taking photos at regular intervals. Ensure quality control checks are taking place.  NEA – carry out at least one test of the product and complete write up. Can it be compared to an existing product? How is the success measured?</p>	<p>1. Completion of NEA 2. Exam Preparation  NEA – further modifications – high quality drawings and links to commercial manufacture. Detailed and informative annotation.  NEA – changes/ tweaks to project based on feedback. Signing of candidate forms etc.  Theory – sources of polymers. From oil to workable material. Categories of plastic and examples in each. Manufacturing techniques for plastic e.g. injection moulding.</p>	<p>1. Exam Preparation  RAG of exam content.  General exam technique e.g. command words, highlighting key words.  Selected weak area revision – exam questions and exam technique  Walking/talking paper – core technical principles  Walking/talking paper – specialist technical principles  Walking/talking – designing and making principles</p>	<p>1. Course Finished</p>

	<p>NEA – modelling techniques – card/straws/play dough etc.</p> <p>NEA – modelling of developed idea. High quality photos and clear outline of why modelling is important. Key changes based on models – think mechanisms, aesthetics etc.</p>	<p>NEA - Manufacturing specification - step by step for making the product.</p> <p>PPE Theory – sources of polymers. From oil to workable material. Categories of plastic and examples in each. Manufacturing techniques for plastic e.g. injection moulding.</p> <p>PPE Theory – sources of metal. From ore to a workable material. Categories of metal and manufacturing techniques e.g. casting.</p> <p>PPE Theory – scales of production. Link to plastics, wood and metal product. E.g. would you use injection moulding for a one-off product.</p> <p>PPE Theory - Human Factors &amp; Environmental Issues.</p>	<p>NEA – testing the product and write up. E.g. stress tests, drop tests, waterproof etc.</p> <p>NEA – write up of third party evaluation with photos. Comparison to existing products.</p> <p>NEA – evaluation of product against specification. Table format with a numerical value to make it comparable to an existing product.</p> <p>NEA – evaluation of product against specification. Table format with a numerical value to make it comparable to an existing product.</p> <p>NEA – evaluation of product against specification. Table format with a numerical value to make it comparable to an existing product.</p>	<p>Theory – exam question based on sourcing and manufacturing wood and plastic. Use notes and sketches – exam technique for higher end of marks. Use of key words e.g. labelling of injection moulding process.</p> <p>Theory – sources of metal. From ore to a workable material. Categories of metal and manufacturing techniques e.g. casting.</p> <p>Theory – scales of production. Link to plastics, wood and metal product. E.g. would you use injection moulding for a one-off product.</p> <p>Theory – assessment of specialist technical principles questions. Add to answers. How can your answer be improved? Show</p>		
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			NEA – further modifications – high quality drawings and links to commercial manufacture.	good answers to group.		
<b>Key knowledge / Retrieval topics</b>	<p><b>Iterative Design Project</b></p> <p>The 'Iterative Design Project' requires learners to undertake a substantial design, make and evaluate project centred on the iterative processes of explore, create and evaluate. Learners identify a design opportunity or problem from a context of their own choice, and create a portfolio of evidence in real time through the project to demonstrate their competence.</p> <ol style="list-style-type: none"> <li>1. Identifying requirements</li> <li>2. Learning from existing products and practice</li> <li>3. Implications of wider issues</li> </ol>	<ol style="list-style-type: none"> <li>5. Material considerations</li> <li>6. Technical understanding</li> <li>7. Manufacturing processes and techniques</li> </ol>	<ol style="list-style-type: none"> <li>8. Viability of design solutions</li> <li>9. Health and safety.</li> </ol>	<p><b>Principles of Design</b></p> <p>This paper is set out through four sets of questions that predominantly cover technical principles. Key Topics:</p> <ul style="list-style-type: none"> <li>• analyse existing products</li> <li>• demonstrate applied mathematical skills</li> <li>• demonstrate their technical knowledge of materials, product functionality, manufacturing processes and techniques</li> <li>• demonstrate their understanding of wider social, moral and environmental issues that impact on the design and manufacturing industries.</li> </ul>	<p><b>Problem Solving in Design</b></p> <p>This component has a series of longer answer questions that require learners to demonstrate their problem solving and critical evaluation skills. Key Topics:</p> <ul style="list-style-type: none"> <li>• apply their knowledge, understanding and skills of designing and manufacturing prototypes and products</li> <li>• demonstrate their higher thinking skills to solve problems and evaluate situations and suitability of design solutions.</li> </ul>	

	4. Design thinking and communication					
<b>Understanding / Sequence of delivery</b>	Continuation of NEA of chosen 'Iterative Design' Design Opportunity from Year 12. Review:	Strand 3 – Create: Design Communication (AO2)	Strand 4 – Create: Final Prototype(s) (AO2)	Strand 4 – Create: Final Prototype(s) (AO2)	Exam Preparation drawing from information from across the strands. Reviewing their ability to apply their technical knowledge to problem solving.	
	Strand 1 – Explore (AO1)	Strand 4 – Create: Final Prototype(s) (AO2)		Strand 5 – Evaluate (AO3)		
	Strand 2 – Create: Design Thinking (AO2)			Exam Preparation drawing from information from across the strands. Reviewing their technical knowledge.		
	NEA Strand 3 – Create: Design Communication (AO2)					
<b>Assessment</b>	Grade: NEA RAG Feedback for individuals.	Grade: NEA RAG Feedback for individuals.	Grade: NEA RAG Feedback for individuals.	Grade: NEA RAG Feedback for individuals.	Grade: Revision Combination of focused exam questions and past papers, graded using relevant years grade boundaries.	
	Generic Feedback	Generic Feedback	Generic Feedback	Generic Feedback		
	All in line with Exam Board	All in line with Exam Board	All in line with Exam Board	All in line with Exam Board		
	POP test using past A level questions, marked using mark scheme. Grades predicted using 2021 grade boundaries.	PPE Nov/Dec 2020 paper marked and grades awarded using Exam Board mark scheme and 2021 grade boundaries.	POP test using past A level questions, marked using mark scheme. Grades predicted using 2021 grade boundaries.	Revision: Combination of focused exam questions and past papers, graded using relevant years grade boundaries.		

