

Design & Technology **Module: Engineering Design**
Year 9

Topic / Theme	Knowledge and Skills	Assessment	Cultural Capital Independent Learning	
Autumn – Term One	<p>Project: LED Lamp</p> <p>This is the first project in the Engineering Design Yr9 Module. Students will be introduced to further electronic principles and product design through the designing and making of an LED lamp. The lamp section of the project allows students to develop further knowledge of the laser cutter & CNC vinyl cutter, and is a design aimed at a specific user. The main body is a base designed by the student and a connecting pole that allows the use of bending jigs. The LED light is powered by USB lead and the whole project encourages students to develop accurate, functional products aimed at a specific user.</p>	<p>Designing: Students develop further understanding of investigating user needs & target groups, and <i>focus on marketing, and use this</i> to generate a specification & ideas to address user requirements. Students will then develop design skills by developing an LED light shade using CAD & laser cutting. Students will then develop further design understanding by designing a base and pole section and how to apply specific features to address user needs. D1, D2, D3, D4, D5</p> <p>Making: Students will learn to use a range of techniques, processes & equipment to shape, form & assemble their LED Lamps, included the manufacture of a laser cut shade with a CNC vinyl cut shape. Students will learn to use a range of tools & equipment to produce a vacuumed formed base and central pole, including using a pipe bender. M1, M2</p> <p>Evaluate: Students will study the work of past and present professionals to develop understanding of design approaches. Students will then develop analytical skills by</p>	<p>F = Foundation C = Core A = Advanced E = Exceptional</p> <p>Design Assessment Criteria coverage</p> <p>F Produce some ideas that address some user needs. Designs show some accuracy & use of instruments. <i>Some 2d / 3d / ICT methods & use of shade & labelling / annotations</i></p> <p>C Produce a range of different ideas to meet user needs & specification points. Mainly accurate designs with use of instruments. <i>2d / 3d / ICT methods used appropriately. Use of shade / tone to represent user & appropriate labelling / annotations</i></p> <p>A Produce a range of suitable ideas based on research to meet different user needs / specification points <i>Accurate use of a range of instruments. A wide range of 2d / 3d / ICT methods used with effectiveness. Use of shade, tone, texture to demonstrate aesthetics & some reference</i></p>	<p>Students are provided with opportunities to experience and gain skills in the use of equipment used in many areas of employment, including power machinery and specialist tools. Students will be able to develop knowledge in the use of computer aided control equipment and robotics to manufacture products, which will develop an understanding of how everyday products are manufactured in industry, and the types of pathway and employment that exist within these sectors. In the Yr9 Engineering module, enrichment of knowledge in a practical context is achieved using a variety of equipment and materials including Jigs and power tools. Tasks within the curriculum encourage the use of a wide array of practical skills and</p>

	<p><u>Topics / Themes addressed</u></p> <p><u>Topics / Themes addressed</u> Designing: Research & Exploration.</p> <p>Designing: Identifying & solving design problems:</p> <p>Developing specifications</p> <p>Designing: Design approaches & communicating designs.</p> <p>Making: Using Specialist tools, equipment, techniques, processes</p> <p>Making: Selecting and using materials</p> <p>Evaluate: Analysing the work of past & present professionals.</p> <p>Investigating new and emerging technologies &</p>	<p>analysing & testing their own and others' products, and test their ideas against user needs. E1, E3, E4</p> <p>Technical Knowledge: Students will develop knowledge of material properties and sustainability issues. Students will understand how basic light circuits could be used in their designs / products. TK1, TK3</p>	<p><i>to ergonomics relevant to the user & appropriate labelling / annotations</i></p> <p>E <i>Produce a range of appropriate ideas based on research to fully meet different user needs / specification points</i> <i>Accurate use of a range of instruments.</i> <i>A wide range of 2d / 3d / Appropriate ICT methods used with effectiveness.</i> <i>Use of shade, tone, texture to demonstrate aesthetics & fully considers ergonomics relevant to the user with appropriate labelling / annotations</i></p> <p><u>Formative assessment of Designing</u> LED Lamp Designs Models</p> <p><u>Making Assessment Criteria coverage</u></p> <p>F <i>Minimal assistance</i> <i>Product mostly complete.</i> <i>Some skill in the use of tools & equipment & some use of CAM</i> <i>Some marking out Minor inaccuracies</i> <i>Some creativity</i></p> <p>C <i>Works independently</i> <i>Product completed and functions.</i> <i>Appropriate planning.</i> <i>Competent level of skill in the use of most tools & equipment & appropriate use of CAM</i></p>	<p>experiences, which are designed to appeal to girls in particular to address issues of gender stereotyping and encourage future pathways and employment in areas with gender disparity. Students are encouraged to understand how other cultures, the beliefs and views of others affect the way products and services are designed. They are taught to reflect on the users of products and how users' views, beliefs and social-economic status affect the way products are designed, and why. In the Yr9 Engineering module, enrichment of knowledge in a design context is achieved using a variety of methods and solutions including the study of past and present designers. Students will develop an understanding of how research and the development of technical knowledge is crucial in an increasingly technological world. Students will gain an awareness of how the designs and work of individuals influence and reflect society, different cultures and social economic groups. Within the Yr9</p>
--	---	---	---	--

	<p>Design implications on society & the environment</p> <p>E3 – Evaluate: Testing and Evaluation</p> <p>TK1 / M2: Selecting, understanding and using materials</p>		<p><i>Mostly accurate marking out with limited inaccuracies</i> <i>Good levels of creativity.</i></p> <p>Sound level of skill in the use of tools & equipment & appropriate use of CAM A <i>Able to plan sequential activities and use plan to manufacture. Works independently</i> <i>Product fully completed with additional features and materials.</i> <i>High level of skill in the use of a range of tools & equipment, including specialist equipment & effective CAD / CAM application</i> <i>Accurate marking out Highly accurate & innovative products</i> <i>High level of creativity & innovation.</i> E <i>Able to plan activities in order of effective staging with timings. Works independently</i> <i>Product fully completed with additional features and materials used in terms of appropriate properties.</i> <i>High level of skill in the use of a range of tools & equipment, including specialist equipment & effective CAD / CAM application</i> <i>Accurate marking out Highly accurate & innovative products</i> <i>High level of creativity, innovation & ingenuity.</i></p> <p>Formative assessment of Making LED Lamp</p>	<p>Engineering module, enrichment of technical knowledge is achieved through studies in areas such as material types and properties, with studies into effects on the environment. Technology extra-curricular clubs provide experiences beyond the home and allow students to develop specific skills and more in-depth knowledge alongside the normal Technology curriculum. Research into concepts, the environment, cultures and the work of past and present designers and their achievements, will develop the students’ understanding of their own potential and the measures, skills and knowledge necessary to succeed. Design & Technology will allow students to develop some understanding of Britain’s contemporary design practice and design heritage, as well as a knowledge of international design practice. We encourage wider reading and the exploration of academic theory in order to investigate concepts. Students are expected to create and develop designs and ideas</p>
--	--	--	---	--

			<p><u>Evaluating Assessment Criteria coverage</u></p> <p>F <i>Able to evaluate products against some specification points and suggest improvements.</i></p> <p>C <i>Able to evaluate products against a range of specification points and suggest how designs could be improved to meet user needs and further needs.</i></p> <p>A <i>Able to evaluate products against a range of criteria & specification points and use some methods of testing a product and evaluate how they were used to improve a product to meet user needs. Able to use analysis to improve product outcomes.</i></p> <p>E <i>Able to evaluate products against a range of criteria & specification points and use effective methods of testing a product and evaluate how they were used to improve a product to meet user needs. Able to use analysis of testing & research (design Cycle stages) to improve product outcomes.</i></p> <p><u>Formative assessment of Evaluating</u> Product analysis Evaluation of LED Lamp</p>	<p>independently with varying degrees of innovation and flair. They will develop problem solving skills through independent learning in both a design and practical context, which will enrich the potential of all students by providing valuable skills and the mind-set to progress independently.</p>
--	--	--	---	---