

Design & Technology Module: Engineering Design
Year 8

	Topic / Theme	Knowledge and Skills	Assessment	Cultural Capital Independent Learning
Autumn – Term One	<p>Project: Image frame</p> <p>This is the first project in the Engineering Design Yr8 Module. Students will develop making skills using various fabrication techniques. The main focus is on timber and aluminium, and specific process of fabrication linked with these materials. They will design & manufacture an image holder, which is a timber based frame, and then design and manufacture feet from aluminium. Students will investigate user needs and develop design to address those needs / specification. The project is designed to build knowledge of marking-out, cutting and fabrication / joining techniques. Students will be expected to develop a product with a high degree of accuracy.</p>	<p>Designing: Students will investigate user needs & target groups, and <i>focus on marketing</i>, using this to generate ideas to address user requirements. They will learn to generate and present design ideas using a range of formats including modelling, CAD, and annotated sketches. This module will also include specific design challenges. D1, D2, D3, D4, D5</p> <p>Making: Students will learn to use a range of techniques, processes & equipment to shape, form & assemble a Timber frame, followed by the manufacture of aluminium feet. Jigs are used to provide understanding of mass production techniques. Students will also learn to use laser cutting techniques & CNC vinyl cutting. M1, M2</p> <p>Evaluate: Students will develop knowledge through the study of past and present professionals. Students will learn to analyse & test their own and others' products and test their ideas against user needs, and learn how to consider improvements, quality control, and environmental issues of materials. E1, E3, E4</p>	<p>F = Foundation C = Core A = Advanced E = Exceptional</p> <p>Design Assessment Criteria coverage</p> <p>F Produce some ideas to meet needs. Limited accuracy Limited use of instruments limited use of colour & labelling / annotations</p> <p>C Produce a range of different ideas to meet needs / constraints. Mostly accurate with use of instruments. 2d / 3d / ICT methods used appropriately. Use of colour to represent user & appropriate labelling / annotations</p> <p>A Produce a range of suitable ideas based on research to meet different user needs / constraints. 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 relevant to the</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 Yr8 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>Topics / Themes addressed <i>Hyperlink to topics</i></p> <p>D1 – Designing: Research & Exploration.</p> <p>D2 – Designing: Identifying & solving design problems:</p> <p>D4 & D5 – Designing: Design approaches & communicating designs.</p> <p>M1 Making: Using Specialist tools, equipment, techniques, processes</p> <p>M2 Making: Selecting and using materials</p> <p>E1 – Evaluate: Analysing the work of past & present professionals.</p> <p>E3 – Evaluate: Testing and Evaluation</p>	<p>Technical Knowledge: Students will develop knowledge of material properties and sustainability issues. Students will also understand how basic light circuits could be used in designs / products. TK1, TK3</p>	<p>user & appropriate labelling / annotations</p> <p>E Use of research to inform & produce a wide range of relevant ideas to meet different user needs / constraints. 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 relevant to the user & appropriate labelling / annotations</p> <p>Formative assessment of Designing Chair Design (3d) – high tech. Frame Design Hairdryer</p> <p>Making Assessment Criteria coverage</p> <p>F Some assistance Product partly complete. Some use of tools & equipment Some inaccuracies Minimal marking out Lack of creativity</p> <p>C Works independently Product fully completed. Sound level of skill in the use of tools & equipment & appropriate use of CAM Accurate marking out Very few inaccuracies Sound creativity.</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 Yr8 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 Yr8</p>
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	<p>TK1 / M2: Selecting, understanding and using materials</p> <p>TK3 - Electrical & Electronic systems</p>		<p>A Able to plan activities Works independently Product fully completed with additional features and materials. High level of skill in the use of a range of tools & equipment, including specialist equipment & effective CAD / CAM application Accurate marking out Very accurate products High level of creativity & innovation.</p> <p>E Plans activities Works independently Highly accurate product with innovative & creative features, and a range of materials used. High level of skill & variety of tools & equipment & effective CAD / CAM application Accurate marking out</p> <p>Formative assessment of Making Main Image frame Plan of making / Diary</p> <p>Evaluating Assessment Criteria coverage</p> <p>F Able to suggest several ways products could be improved.</p> <p>C Able to evaluate products against a range of criteria and suggest how they could be improved to meet user needs.</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>
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Design & Technology Module: Product / Engineering Design Year 8				
	Topic / Theme	Knowledge and Skills	Assessment	Cultural Capital Independent Learning
Autumn – Term Two	<p>Project: <i>Mobile Phone Holder</i></p> <p>This is the second project in the Yr8 Engineering design module. It is intended to build on the first module by allowing students to extend and reinforce the knowledge gained in the first module. The project is a mobile phone holder, principally constructed from timber. Students will develop further their skills learnt from project (1) & construct a frame using fabrication techniques. Students will have the</p>	<p>Designing: Students develop further understanding of user needs & market groups, and research findings to generate ideas in response to a brief. 2D designs (orthographic) & 3D designs (isometric) are generated & presented using a range of formats including CAD. This module will also include specific design challenges. D1, D2, D3, D4, D5</p> <p>Making: Students use a range of techniques, processes & equipment to mark out, shape & form Timbers (plywood) Students will use& develop their understanding from prior learning of common fabrication techniques associated</p>	<p>F = Foundation C = Core A = Advanced E = Exceptional</p> <p>Design Assessment Criteria coverage</p> <p>F Produce some ideas to meet needs. Limited accuracy Limited use of instruments limited use of colour & labelling / annotations</p> <p>C Produce a range of different ideas to meet needs / constraints. Mostly accurate with use of instruments. 2d / 3d / ICT methods used appropriately.</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</p>

	<p>opportunity to customise part of the design to reflect user needs. Students will also use specific plastics to enhance the aesthetic of the design in-line with user needs. The project will allow students to learn and develop key skills in fabrication, including the use of CAD / CAM.</p> <p><u>Topics / Themes addressed</u> Hyperlink to topics</p> <p><u>Topics / Themes addressed</u> Hyperlink to topics</p> <p>D1 – Designing: Research & Exploration.</p> <p>D2 – Designing: Identifying & solving design problems:</p> <p>D4 & D5 – Designing: Design approaches & communicating designs.</p>	<p>with timbers & select & use more complex materials to add features to their designs. M1, M2</p> <p>Evaluate: Students will analyse their own and others' work with a view to improving their products, and considering markets. E1, E2, E3</p> <p>Technical Knowledge: Students will develop knowledge of material properties and sustainability issues & how products could be improved through the use of electronic features. TK1, TK4</p>	<p>Use of colour to represent user & appropriate labelling / annotations</p> <p>A Produce a range of suitable ideas based on research to meet different user needs / constraints. 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 relevant to the user & appropriate labelling / annotations</p> <p>E Use of research to inform & produce a wide range of relevant ideas to meet different user needs / constraints. 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 relevant to the user & appropriate labelling / annotations</p> <p><u>Formative assessment of Designing</u> Chair Design (3d) – high tech. Frame Design Hairdryer</p> <p><u>Making Assessment Criteria coverage</u> F Some assistance Product partly complete. Some use of tools & equipment</p>	<p>these sectors. In the Yr8 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 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 Yr8 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.</p>
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	<p>M1 Making: Using Specialist tools, equipment, techniques, processes</p> <p>M2 Making: Selecting and using materials</p> <p>E1 – Evaluate: Analysing the work of past & present professionals.</p> <p>E3 – Evaluate: Testing and Evaluation</p> <p>TK1 / M2: Selecting, understanding and using materials</p> <p>TK3 - Electrical & Electronic systems</p>		<p>Some inaccuracies Minimal marking out Lack of creativity C Works independently Product fully completed. Sound level of skill in the use of tools & equipment & appropriate use of CAM Accurate marking out Very few inaccuracies Sound creativity. A Able to plan activities Works independently Product fully completed with additional features and materials. High level of skill in the use of a range of tools & equipment, including specialist equipment & effective CAD / CAM application Accurate marking out Very accurate products High level of creativity & innovation. E Plans activities Works independently Highly accurate product with innovative & creative features, and a range of materials used. High level of skill & variety of tools & equipment & effective CAD / CAM application Accurate marking out</p> <p>Formative assessment of Making Main Image frame Plan of making / Diary</p> <p>Evaluating Assessment Criteria coverage</p>	<p>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 Yr8 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</p>
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Autumn – Term One & Two	<p>Project: <i>Systems & Control – BBC Micro bit</i> (3 weeks) This is a focused area of knowledge in the Yr9 Engineering design module. Students will use a BBC Micro bit control board, and output device to complete a control task. Students will work individually and in teams to complete a range of control technology task which require programming skills & understanding. <u>Topics / Themes addressed</u> Hyperlink to topics D1 – Designing: Research & Exploration. TK3 - Electrical & Electronic systems</p>	<p><i>Systems & Control – BBC Micro bit</i></p> <p>Students will learn the principles of computer and electronic control, and how programming is used to imbed intelligence into products to control sensors and other output devices.</p> <p>Students will gain knowledge of specific device programming and how to control various devices by writing programs using a micro bit.</p>	<p><i>Systems & Control – BBC Micro bit</i></p> <p>Students will be assessed through a separate criteria relating to control:</p> <ul style="list-style-type: none"> • Technical Knowledge (evidence of research & response) • Technical understanding & problem solving ability. <p>This unit address the criteria for TK3 - Electrical & Electronic systems</p>	<p>Students are provided with opportunities to experience and gain skills in the use of equipment used in many areas of employment, including control equipment and mechanical systems. Students will be able to develop knowledge in the use of computer aided control equipment and robotics to investigate products, which will develop an understanding of how everyday products use control & mechanisms, 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. Tasks within the unit encourage the use of a wide array of practical skills and 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,</p>
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	<p>Project: <i>Mechanisms project</i> (3 weeks) This is a focused area of knowledge in the Yr9 Engineering design module. Students will</p> <p><i>Hyperlink to topics</i> D1 – Designing: Research & Exploration.</p> <p>TK2 - Mechanical systems / mechanisms</p>	<p><i>Mechanisms project</i></p> <p>Technical knowledge: Students will develop an understanding of mechanisms, and how mechanisms are incorporated into products to create force and movement. Students will gain core knowledge of movements and mechanism types. Students will also develop core understanding of the types of movement and mechanism, and the industrial applications by completing knowledge based worksheets. Students will then develop further understanding by moving onto practical examples of using different types of mechanism and how these can be adapted to create different movements and forces.</p>	<p><i>Mechanisms project</i></p> <p>Students will be assessed through a separate criteria relating to Mechanisms:</p> <ul style="list-style-type: none"> • Technical Knowledge (evidence of research & response) • Technical understanding & problem solving ability. • Outcome of task(s) <p>This unit address the criteria for TK2 - Electrical & Electronic systems</p>	<p>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. 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</p>
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