

Curriculum Map: Design & Technology Year 9

	Autumn 1 Design Ventura	Autumn 2 Light Box	Spring 1 CAD – SolidWorks GCSE Core Theory	Spring 2, Summer 1 & Summer 2 Acrylic Organiser (mini NEA) GCSE Core Theory
<p>Content Declarative knowledge 'I Know'</p>	<p>Understand the project brief.</p> <p>Understand what is meant by user centred design.</p> <p>Understand how designers work in teams and make individual and group contributions to the design process.</p> <p>Understand how branding is used to market products to a target audience.</p> <p>Understand how design is influenced by the business context for a product.</p> <p>Understand how costing and budgeting is related to product planning.</p> <p>Understand the importance of critical reflection in learning and designing.</p>	<p>Understand basic electronic components and how to program a microcontroller using flowcharts.</p> <p>Understand how electronics and programable components can be used to enhance the function of a product.</p> <p>Identify basic electronic components and their function/application.</p> <p>Understand the hazards and control measures associated with soldering.</p> <p>Understand wood joints (half lap joint) can be used to make a box frame.</p> <p>Understand the hazards and control measures associated with a range of different tools and equipment (Timbers).</p>	<p>To apply knowledge and understanding of working properties, characteristics, applications, advantages and disadvantages of the following types of materials, in order to be able to discriminate between them and select appropriately:</p> <p>1.8 Metals 1.9 Papers and Boards 1.10 Polymers 1.11 Textiles 1.12 Timbers</p> <p>1.6 Recognise and apply knowledge and understanding of the working characteristics, applications, advantages and disadvantages of electronic systems.</p>	<p>Spring 2: 1.4 To apply technical knowledge and understanding of the characteristics, applications, advantages and disadvantages of modern and smart materials.</p> <p>1.7 The performance and functionality of using programmable components.</p> <p>Summer 1: 1.5 The performance, principles, applications and the influence of mechanical devices on the design of products.</p> <p>1.1 To apply a breadth of technical knowledge and understanding of the characteristics, advantages and disadvantages of new and emerging technologies.</p> <p>Summer 2: 1.2 To recognise the importance of the evaluative process and respective criteria when considering the impact of new and emerging technologies to a range of scenarios.</p> <p>1.3 The processes, applications, characteristics, advantages and disadvantages of energy generation and storage, in order to be able to discriminate between them and to select appropriately.</p>
<p>Skills Procedural Knowledge 'I know how to'</p>	<p>Investigate the design and business context and why it is important in design.</p> <p>Generate initial ideas for a product.</p> <p>Use a user centred design approach to find out the needs and wants of the user.</p>	<p>1.17 Apply techniques when communicating and recording design ideas.</p> <p>Demonstrate skilful soldering technique.</p> <p>Demonstrate the use of basic commands in the correct</p>	<p>Demonstrate skilful Computer Aided Design (CAD) techniques using 3D modelling software.</p> <p>Demonstrate a range of SolidWorks tools (extruded feature, revolved feature, fillet tool, chamfer tool).</p>	<p>Develop realistic design proposals as a result of the exploration of design opportunities and users' needs, wants and values.</p> <p>Use imagination, experimentation and combine ideas when designing.</p> <p>Develop the skills to critique and refine ideas while designing and making.</p>

	<p>Ensure that a design fits the business context.</p> <p>Use research to inform design development.</p> <p>Develop business and marketing plans.</p> <p>Evaluate designs and feedback to generate final product designs.</p> <p>Use a range of methods and techniques to communicate the final design.</p> <p>Plan and deliver a professional pitch.</p> <p>Evaluate personal and team contribution to the project.</p> <p>Consider the overall effectiveness of the design and consider how it could be improved further.</p> <p>1.17 Apply techniques when communicating and recording design ideas.</p>	<p>sequence to create a functioning program.</p> <p>Apply a secure knowledge of flowcharts to perform different functions.</p> <p>Demonstrate safe and skilful use of a range of tools.</p> <p>Manufacture a high-quality functioning product.</p> <p>Demonstrate a sustained high degree of safe working practice for self and others.</p>	<p>Create a realistic render of your final design.</p> <p>Create an orthographic drawing of your final design.</p>	<p>Apply a broad knowledge of materials, components and technologies and practical skills to develop high-quality, imaginative and functional prototypes.</p> <p>Show a fully sound understanding of material properties of the materials used in the prototype.</p> <p>Produce a prototype that demonstrates fully competent making skills.</p> <p>Demonstrate fully competent use of tools, equipment and techniques for the manufacture of the prototype.</p> <p>Demonstrate a sustained high degree of safe working practice for self and others.</p> <p>Show a fully sound understanding of the need for accuracy.</p>
<p>Strategies Conditional Knowledge 'I know when to'</p>	<p>Work as a team and individually to ensure the design meets the users' needs</p> <p>Use a range of techniques to develop the design.</p> <p>Apply skills used and learned during the project in other areas of learning</p> <p>Consider the environmental impact of the chosen materials and processes.</p>	<p>Apply your knowledge and understanding of programming to create functioning products.</p> <p>Apply your knowledge of components to identify different inputs, processes and outputs.</p> <p>Apply a comprehensive understanding of tools and equipment to select the appropriate tool for the task (Timbers).</p>	<p>Develop, communicate, record and justify design ideas, applying suitable CAD techniques.</p> <p>Apply considered selection and fully appropriate use of computer-aided design (CAD) techniques to communicate design ideas.</p>	<p>Communicate design ideas and decisions using different media and techniques, as appropriate for different audiences at key points in the design process.</p> <p>Apply decision-making skills, including the planning and organisation of time and resources when managing project work.</p> <p>Be ambitious and open to explore and take design risks in order to stretch the development of design proposals, avoiding clichéd or stereotypical responses.</p>

				Use key design and technology terminology, including those related to: designing, innovation and communication; materials and technologies; making, manufacture and production; critiquing, values and ethics.
Key Questions	<p>2021 Design Ventura Brief “The Senses”:</p> <p>What can you see, hear, smell, taste and touch around you? What ideas does that inspire?</p> <p>Who will the product be used by and how?</p> <p>Is it accessible?</p> <p>Can it be used by everyone?</p> <p>How will it be made and where will it end up?</p>	<p>What are inputs, processes and outputs and how can they be used to improve the function of electronic products?</p> <p>How can flow charts be used to program a product to perform different functions?</p> <p>How can timbers be used effectively in a functioning product?</p>	<p>How can we effectively use CAD/CAM?</p> <p>What is the impact of CAD/CAM on society?</p>	<p>How can thermosetting polymers be used to create functioning products?</p> <p>How can you effectively communicate design ideas using different graphical communication techniques?</p> <p>What are the environmental impacts of using polymers?</p>
Assessment topics	AO1 Investigate, AO2 Design & Prototype, AO3 Analyse and Evaluate, AO4 Core Technical Skills	AO2 Design & Prototype, AO4 Core Technical Skills	AO4 Core Technical Skills	AO1 Investigate, AO2 Design & Prototype, AO3 Analyse and Evaluate, AO4 Core Technical Skills
Cross curricular links/Character Education	<p>Independent inquiry</p> <p>Collaborative working</p> <p>Considering the needs of others</p> <p>Critical thinking</p> <p>Considering real world issues</p> <p>Problem solving</p> <p>Financial planning</p> <p>Communication</p> <p>Planning and organising</p> <p>Self-management</p> <p>Reflective learning</p> <p>Understanding professional practice</p> <p>Health and Safety – Developing a working knowledge of safety.</p>	<p>Develop an understanding of the sustainability of timers (sourcing, reducing waste, recycling)</p> <p>Health and Safety – Developing a working knowledge of safety.</p> <p>Science – Polarised components.</p> <p>Computing – Programming a PIC.</p> <p>Health and Safety – Developing a working knowledge of safety.</p>	<p>Computing – the use of CAD/CAM</p> <p>Maths – dimensioning and geometry.</p>	<p>Computing – the use of CAD/CAM</p> <p>Maths – dimensioning and geometry.</p> <p>Art - Sketching techniques/graphical communication.</p> <p>Health and Safety – Developing a working knowledge of safety.</p>