

 <b>Design &amp; Technology</b>	<b>Intent</b> GCSE Design and Technology will prepare students to participate confidently and successfully in an increasingly technological world. Students will gain awareness and learn from wider influences on Design and Technology including historical, social, cultural, environmental, and economic factors. Students will get the opportunity to work creatively when designing and making and apply technical and practical expertise. This GCSE allows students to study core technical, designing and making principles, including a broad range of design processes, materials techniques, and equipment. They will have the opportunity to study their specialist technical principles in greater depth. Through Non-Examination style skills-based projects, students will get the opportunity to build and apply a repertoire of knowledge, understanding and skills to design and make high-quality prototype products for a wide range of users.					
<b>Year 10</b>	<b>Unit 1: Core &amp; Technical Principles (September-December)</b>	<b>Unit 2: Contextual Design Challenge (September -January)</b>	<b>Unit 3: (Specialist Principles (January-February)</b>	<b>Unit 4: Practical Challenge (February-May)</b>	<b>Unit 5: Design &amp; Making Principles (March-May)</b>	<b>Unit 6: Exploring the NEA Context (June-July)</b>
<b>Knowledge</b> (facts, information, concepts and key terminology)	<ul style="list-style-type: none"> <li>The impact of new and emerging technologies.</li> <li>The categorisation of material types and their properties the development of new materials.</li> <li>Energy generation and how this is used in products and systems.</li> <li>Electronic systems &amp; programmable components.</li> <li>How mechanical devices produce movement.</li> </ul>	<ul style="list-style-type: none"> <li>Use primary and secondary research data to identify a design problem, an intended user/ client to ascertain needs &amp; requirements.</li> <li>Summarise findings to write a design brief specification for the problem identified.</li> <li>Generate design ideas using a range of different design strategies to avoid fixation.</li> <li>Communicate, record, and justify design ideas including material &amp; component selection.</li> </ul>	<ul style="list-style-type: none"> <li>The selection of materials &amp; components with regards to their source, form, type, and size.</li> <li>Physical and working properties of materials that affect performance and environmental impact.</li> <li>Treatments and surface finishes applied to materials for aesthetic &amp; functional purposes.</li> <li>Use materials, specialist tools, equipment, techniques, and processes to manufacture products.</li> <li>The manufacturing methods used for different scales of production.</li> </ul>	<ul style="list-style-type: none"> <li>Designing to meet the needs of a specific user or audience.</li> <li>Health and safety in a product design workshop</li> <li>Manufacturing processes including CAD/CAM</li> <li>Working properties of various materials.</li> <li>Dimensions and tolerance.</li> <li>Methods of joining materials using subject specialist manufacturing processes.</li> </ul>	<ul style="list-style-type: none"> <li>Investigating further primary and secondary techniques that are applied in industry to understand client and/or user needs.</li> <li>Review the work of other designers and design companies.</li> <li>Generating ideas using a range of different design strategies to explore, develop and communicate designs.</li> <li>Developing prototypes in response to client wants and needs.</li> </ul>	<ul style="list-style-type: none"> <li>Use primary and secondary research data to identify a design problem, an intended user/ client to ascertain needs &amp; requirements.</li> <li>Summarise findings to write a design brief specification for the problem identified.</li> <li>Generate design ideas using a range of different design strategies to avoid fixation.</li> <li>Communicate, record, and justify design ideas including material &amp; component selection.</li> </ul>
<b>Understanding</b> (ability to connect and synthesise knowledge within a context)	<ul style="list-style-type: none"> <li>How computers &amp; automation impact manufacturing through robotics, CAD &amp; CAM.</li> <li>How new technologies need to be developed/ sustainably to reduce environmental impact.</li> <li>The primary sources and properties of a range of materials.</li> <li>How power is generated through renewable and non-renewable energy sources.</li> <li>The principles of different electronic systems.</li> </ul>	<ul style="list-style-type: none"> <li>How to respond to a design context through focused analysis.</li> <li>Summarise findings of primary &amp; secondary investigation sources to write a design brief and specification.</li> <li>Develop design proposals for an identified user using a range of appropriate techniques.</li> <li>Evaluate their work as it develops to ensure their product meets the requirements of the context/user.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise and describe different types of materials and their properties related to their chosen specialism.</li> <li>Select suitable materials for form, functional performance, and aesthetics appropriate to a specific task.</li> <li>Use specialist tools and equipment to accurately manufacture products safely.</li> <li>Apply knowledge to shape, join and finish materials.</li> <li>How products are produced in different volumes</li> </ul>	<ul style="list-style-type: none"> <li>How designers analyse information in response to a context or brief.</li> <li>Generating ideas suitable for an intended user or audience.</li> <li>Use specialist tools and equipment to accurately manufacture products safely.</li> <li>Apply knowledge to shape, join and finish materials.</li> <li>Test, evaluate and refine ideas and practical work as it develops and review success &amp; areas for improvement for the intended product use and its user.</li> </ul>	<ul style="list-style-type: none"> <li>How primary and secondary data can be collected to assist the understanding of client and user needs, writing a design brief &amp; specification.</li> <li>Investigating the work of other designers and design companies to inform designs.</li> <li>How to develop, communicate, record, and justify design decisions.</li> <li>Apply knowledge of cutting, shaping, joining, and finishing materials to manufacture a prototype product.</li> </ul>	<ul style="list-style-type: none"> <li>How to respond to a design context through focused analysis.</li> <li>Summarise findings of primary &amp; secondary investigation sources to write a design brief and specification.</li> <li>Develop design proposals for an identified user using a range of appropriate techniques</li> <li>Evaluate their work as it develops to ensure their product meets the requirements of the context/user.</li> </ul>
<b>Skills</b> (successful application of knowledge and understanding to a specific task)	<ul style="list-style-type: none"> <li>Recall how computers &amp; automation influence manufacturing systems.</li> <li>Apply CAD &amp; CAM to model ideas and design proposals.</li> <li>Recognise the impact materials have on society &amp; the environment and implement responsible design when selecting materials for prototypes.</li> <li>Identify and characterise different types of materials and their properties for an intended use.</li> <li>Identify renewable and non-renewable energy sources including arguments for and against each type.</li> <li>Recognise common electronic systems &amp; components and the functionality they perform.</li> </ul>	<ul style="list-style-type: none"> <li>Analyse the design context and primary &amp; secondary existing research to identify a need and potential user to formulate ideas that are fit for purpose.</li> <li>Create a design Brief &amp; Specification for a project.</li> <li>Apply knowledge of different design strategies and understanding of material properties to develop design proposals that fulfil the requirements of the design context, client/user needs requirement.</li> <li>Test, evaluate and refine ideas as they develop to review success &amp; areas for improvement.</li> </ul>	<ul style="list-style-type: none"> <li>Recall and describe different types of materials and processes related to their chosen specialism.</li> <li>Select appropriate materials for a specific task considering form, function performance, and aesthetics.</li> <li>Identify the correct tools, machines, equipment &amp; process for materials.</li> <li>Use specialist tools, equipment &amp; machinery accurately and safely to cut, shape, join, finish and materials to manufacture a prototype product.</li> <li>Link the use of relevant specialist tools, equipment &amp; processes to the appropriate level of commercial production.</li> </ul>	<ul style="list-style-type: none"> <li>Generating ideas suitable for an intended user or audience.</li> <li>Identify the correct tools, machines, equipment &amp; process for materials.</li> <li>Use specialist tools, equipment &amp; machinery accurately and safely to cut, shape, join, finish and materials to manufacture a prototype product.</li> <li>Test, evaluate and refine ideas and practical work as it develops to review the products success &amp; areas for improvement.</li> </ul>	<ul style="list-style-type: none"> <li>Analyse the context, primary &amp; secondary sources to identify a need and potential client and write a design Brief &amp; Specification.</li> <li>Formulate ideas that are fit for purpose and suited to client/user needs and requirements based on investigation.</li> <li>Use specialist tools, equipment &amp; machinery accurately and safely to cut, shape, join, finish and materials to manufacture a prototype product.</li> <li>Test, evaluate and refine ideas as they develop to review success &amp; areas for improvement.</li> </ul>	<ul style="list-style-type: none"> <li>Analyse the design context and primary &amp; secondary existing research to identify a need and potential user to formulate ideas that are fit for purpose.</li> <li>Create a design Brief &amp; Specification</li> <li>Apply knowledge of different design strategies and material properties to develop design proposals that fulfil the requirements of the design context and identified user.</li> <li>Test, evaluate and refine ideas as it develops and review success &amp; areas for improvement.</li> </ul>
<b>Formal Assessments</b> (those done by all/vast majority of the cohort)	<b>Unit tests will take place at the end of each topic:</b> <ul style="list-style-type: none"> <li>New &amp; Emerging Technologies</li> <li>Materials and their working properties &amp; Development in new materials</li> <li>Energy, materials, Systems &amp; Devices</li> </ul>	Teacher assessment (written & verbal) will take place during and following each assessment objective: <ul style="list-style-type: none"> <li><b>A01:</b> Identify, investigate, and outline design possibilities to address needs and wants.</li> <li><b>A02:</b> Design prototypes that are fit for purpose.</li> <li><b>A03:</b> Analyse &amp; evaluate design decisions.</li> </ul>	<b>A unit test will take place at the end of the topic.</b>	Teacher assessment (written & verbal) will take place during and following the completion of the assessment objective: <ul style="list-style-type: none"> <li><b>A02:</b> Design &amp; make prototypes that are fit for purpose.</li> </ul>	End of year examination: Teacher assessment (written & verbal) will take place during and following the assessment objective <b>A04:</b> Demonstrate and apply knowledge and understanding of all the Design & Technology principles.	Teacher assessment will take place following the completion of each assessment objective and all work will be marked and internally moderated. <ul style="list-style-type: none"> <li><b>A01:</b> Identify, investigate &amp; outline design possibilities to address needs and wants.</li> </ul>
<b>By the end of the year students on course for at least a grade 5 in Design &amp; Technology will...</b> <ul style="list-style-type: none"> <li>Demonstrate and apply mostly accurate and appropriate knowledge and understanding of the principles of design and technology in familiar and unfamiliar situations.</li> <li>Develop functioning intentions of prototypes; demonstrate safe and effective technical skills that are appropriate for the prototype/s.</li> <li>Apply appropriate technical language and methods of communication, such as formal drawings and annotated sketches including CAD and modelling (including mathematical).</li> <li>Analyse and evaluate design decisions and outcomes to draw plausible conclusions supported by some evidence.</li> <li>Use some mathematical skills and scientific knowledge to make accurate calculations to inform choices.</li> </ul>						

