

# Design & Technology Curriculum Map Year 10

Term	UNIT OF STUDY	Curriculum Guidelines	NC –Aims / Focus Points
Autumn 1	<p><b>Demonstrate creativity</b></p> <p><b>Computer applications</b></p> <p><b>Design of products</b></p>	<p>(AO1) Identifies complex links between principles of good design and technological knowledge.</p> <p>(AO1) Identifies and demonstrates a thorough understanding of the significance of trends in existing solutions; reinterprets and applies this understanding in imaginative ways using appropriate techniques.</p> <p>(AO1) Recall, select and communicate their knowledge and understanding in Design and Technology including its wider effects</p> <p>(AO2) Produces a comprehensive range of creative, original and developed design ideas and communicates these using appropriate strategies.</p> <p>(AO2) Uses detailed drawing and annotation to communicate all of the details of the design chosen for prototype production.</p>	<p>Use appropriate recording and drawing techniques including the use of ICT. Identify complex associations linking principles of good design and technological knowledge.</p> <p>Identify trends in existing products and fully evaluate them against the needs of the intended user</p> <p>Use of CAD packages in the school environment for producing drawings and 2D/3D images.</p> <p>On-screen modelling and manipulation of images. Appropriate use of text, database and graphics software in school and commercial situations. Storing and sharing data electronically.</p> <p>Application of CAD/CAM to the designing and making of models and prototypes. Understand the application of CAD/CAM to one-off and quantity production.</p> <p>Be familiar with Computer Numerical Control of</p>

			<p>machines (CNC) such as lathes, milling machines, routers, machining centres, laser cutters.</p> <p>Generate and record a range of innovative design solutions. Evaluate and modify ideas with consideration to creativity and sustainability. Consider the initial task, the need to be met, function and aesthetics.</p> <p>Anthropometrics and ergonomics.</p> <p>Develop and model design proposals.</p> <p>Select and justify materials when designing and making products.</p> <p>Understand the purpose of prototyping when designing and making products</p> <p>Identify a variety of materials used when prototyping, including card, Plasticard, foam board, Corriflute, MDF and Styrofoam. • Understand the principles of anthropometrics and ergonomics when designing and making products.</p>
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<p style="text-align: center;"><b>Autumn 2</b></p>	<p style="text-align: center;"><b>Develop designing skills</b></p> <p style="text-align: center;"><b>Environmental issues</b></p> <p style="text-align: center;"><b>Design issues</b></p>	<p>AO2) Provides an appropriate, detailed and considered response to a brief and produces a thorough specification for a prototype product.</p> <p>(AO2) Produces a comprehensive range of creative, original and developed design ideas and communicates these using appropriate strategies.</p> <p>(AO2) Uses detailed drawing and annotation to communicate all of the details of the design chosen for prototype production.</p> <p>(AO1) Recall, select and communicate their knowledge and understanding in Design and Technology including its wider effects.</p> <p>(AO1) Recall, select and communicate their knowledge and understanding in Design and Technology including its wider effects.</p>	<p>Produce an appropriate and considered response to a design brief.</p> <ul style="list-style-type: none"> <li>• Produce a detailed specification for the product.</li> <li>• Use detailed notes and annotated drawings to record original design ideas.</li> <li>• Use appropriate modelling techniques to aid product development.</li> <li>• Use CAD to support design development.</li> <li>• Using drawing and annotation, clearly communicate details of the design chosen for prototype* production.</li> </ul> <p>The reduction in the common use of chemicals and materials dangerous to the environment, i.e. bleaches, CFCs, toxic materials</p> <p>Carbon footprint – transportation of materials and goods, energy usage in manufacture. Carbon offsetting</p> <p>The need to dispose of redundant products and their packaging in a safe and environmentally friendly way.</p>
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			<p>Identify how good design and product choice improves the quality of life.          Examine the way that designers respond to changing styles, taste, technological advances, and environmental pressures.          Eco-design. The whole system of looking at a product from design to finished article, its use of materials and energy.          The globalisation of products.</p>
<p>Spring 1</p>	<p><b>Develop designing skills</b></p> <p><b>Product planning</b></p> <p><b>The 6Rs</b></p>	<p>) Provides an appropriate, detailed and considered response to a brief and produces a thorough specification for a prototype product.          (AO2) Produces a comprehensive range of creative, original and developed design ideas and communicates these using appropriate strategies.          (AO2) Uses detailed drawing and annotation to communicate all of the details of the design chosen for prototype production.          (AO2) Apply knowledge,</p>	<p>Produce an appropriate and considered response to a design brief.          Produce a detailed specification for the product.          Use detailed notes and annotated drawings to record original design ideas.          Use appropriate modelling techniques to aid product development.          Use CAD to support design development.          Using drawing and annotation, clearly communicate details of the design chosen for prototype* production.</p>

		<p>understanding and skills in a variety of contexts and in designing and making products.  (AO1) Recall, select and communicate their knowledge and understanding in Design and Technology including its wider effects</p>	<p>Produce a detailed plan for manufacturing that includes information about: - materials and manufactured items - tools and equipment - processes - health and safety - time schedules.  Choose and prepare materials economically considering cost, sustainability, environmental, moral and cultural issues.  Plan work to make best use of materials, components, equipment and resources, including time and energy.  Be aware of problems that arise during production and have strategies to overcome them.</p> <p>Students must understand product life cycle and life cycle analysis</p>
<p>Spring 2</p>	<p><b>Demonstrate good making skills</b></p> <p><b>Processes used to make products from resistant materials</b></p>	<p>(AO1/ AO2) Select and use hand and machine tools that are consistently appropriate.  (AO2) Works consistently safely, skilfully and competently to assemble, construct and finish materials and components to achieve</p>	<p>Plan and organise activities.</p> <ul style="list-style-type: none"> <li>• Make reasoned decisions about materials and components.</li> <li>• Select appropriate materials.</li> <li>• Select appropriate equipment.</li> </ul>

		<p>a high quality 3D prototype product.</p> <p>(A01/A02) Consistently selects and uses workshop/ design studio facilities appropriately to realise the prototype product.</p> <p>(AO2) Records key stages involved in the making of the prototype product, by providing comprehensive notes and photographic evidence.</p> <p>(AO2) Demonstrates a thorough practical understanding and ability in solving technical problems effectively and efficiently as they arise.</p> <p>(AO1/ AO2) Select and use hand and machine tools that are consistently appropriate.</p>	<p>Work skilfully and safely to shape, form and finish materials and assemble components.</p> <p>Complete a quality prototype*.</p> <p>Apply knowledge of systems and control, digital media and new technologies as appropriate.</p> <p>Demonstrate a practical and thorough understanding and ability in solving technical problems effectively and efficiently as they arise.</p> <p>Record key stages in the making of the prototype*</p> <p>Preparing, marking out, measuring and testing; using: a rule, try square, dividers, scribe, punches and templates.</p> <p>Wasting: using hand methods such as sawing, drilling, chiselling, planing, or using machines such as a router, jigsaw, centre lathe or milling machine.</p> <p>Deforming: by means of laminating, bending, press moulding, vacuum forming, blow moulding and line</p>
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			<p>bending  Fabricating: - using temporary methods such as screws, nuts and bolts and knock-down fittings - using permanent methods such as adhesive, with nail, dowel, halving, comb, butt, rebate, mortise and tenon, housing and mitre joint, braze, solder, pop rivet and weld.  Re-forming; by means of die casting, injection moulding and extrusion.  Systems and control – understand the purpose (and use as appropriate) of jigs, fixtures, templates and patterns to control accuracy in the batch production of products.</p>
<p>Summer 1</p>	<p><b>Demonstrate good making skills</b></p> <p><b>Materials</b></p>	<p>Plans and organises complex activities. Selects and uses materials that are consistently appropriate.  (AO1/ AO2) Select and use hand and machine tools that are consistently appropriate.  (AO2) Works consistently safely, skilfully and competently to assemble, construct and finish materials and components to achieve</p>	<p>Plan and organise activities.</p> <ul style="list-style-type: none"> <li>• Make reasoned decisions about materials and components.</li> <li>• Select appropriate materials.</li> <li>• Select appropriate equipment.</li> <li>• Work skilfully and safely to shape, form and finish materials and assemble components.</li> </ul>

		<p>a high quality 3D prototype product.</p> <p>(A01/A02) Consistently selects and uses workshop/ design studio facilities appropriately to realise the prototype product.</p> <p>(AO2) Records key stages involved in the making of the prototype product, by providing comprehensive notes and photographic evidence.</p> <p>(AO2) Demonstrates a thorough practical understanding and ability in solving technical problems effectively and efficiently as they arise.</p> <p>(AO2) Apply knowledge, understanding and skills in a variety of contexts and in designing and making products.</p>	<p>Complete a quality prototype*.</p> <p>Apply knowledge of systems and control, digital media and new technologies as appropriate.</p> <p>Demonstrate a practical and thorough understanding and ability in solving technical problems effectively and efficiently as they arise.</p> <p>Record key stages in the making of the prototype*</p> <p>To use knowledge and learn about General classification of resistant materials, Performance characteristics of resistant materials, 'Smart' and modern materials.</p> <p>The conversion or altering of resistant materials into other usable forms.</p> <p>The finishing processes applied to resistant materials to improve performance and appearance</p> <p>Form of materials and their selection</p>
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<p>Summer 2</p>	<p><b>Demonstrate critical evaluation skills</b></p> <p><b>Product evaluation</b></p>	<p>AO3) Critical evaluation of the processes involved in designing and making the prototype which reflects and suggests modifications to improve the modelling and prototyping process</p> <p>(AO3)Analyse and evaluate products, including their design and production.</p>	<p>Evaluate the processes involved in making the final prototype*.</p> <p>Suggest modifications to improve the modelling and prototyping process.</p> <p>Establish the function of products; determine what the product was designed to do. Determine the intended market or user of the product. Give reasons why specific materials have been used by referring to the performance characteristics of materials. Compare a variety of Resistant Materials products designed to meet the same need. Test products to determine fitness for purpose and identify improvements to the design and materials and processes used with reference to use, innovation, environmental and sustainability issues.</p>
<p><b>Notes*****</b></p>			