

## Design and Technology Curriculum Map for KS3 and KS4

### Key Stage 3

At Cloughside College at key stage 3 we follow the national curriculum for design and technology with aims to ensure that all pupils:

- ❖ Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- ❖ Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- ❖ Critique, evaluate and test their ideas and products and the work of others

The curriculum maps provide an overview of the Year 7, Year 8 and Year 9 course content for Design and Technology. These maps give an outline of the topics which are covered, the skills involved and how they link to the national curriculum programmes of study.

Year 7	Year 8	Year 9
<p>During this year in design and technology students will:</p> <ul style="list-style-type: none"> <li>• Use research and exploration, such as the study of different cultures, to identify and understand user needs</li> <li>• Analyse the work of past and present professionals and others to develop and broaden their understanding</li> <li>• Identify and solve their own design problems and understand how to reformulate</li> <li>• Design products that respond to user needs in a variety of situations</li> <li>• Develop modelling skills</li> <li>• Build essential CAD skills (Techsoft)</li> <li>• Select from and use specialist tools, techniques, processes, equipment and machinery precisely</li> <li>• Develop and communicate design ideas</li> </ul>	<p>During this year in design and technology students will:</p> <ul style="list-style-type: none"> <li>• Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture</li> <li>• Select from and use a wider, more complex range of materials, components and ingredients, considering their properties</li> <li>• Consider the needs of other users and how designs are adapted for different markets. Understand synthetic fibre sources, building on year 7 knowledge of natural fibre sources</li> <li>• Ability to design and select based upon creativity and enterprise</li> <li>• Product analysis skills and application</li> <li>• Understand how designers create products for users</li> <li>• Understand how designers apply strategies</li> </ul>	<p>During this year in design and technology students will:</p> <ul style="list-style-type: none"> <li>• Use a variety of approaches to generate creative ideas and communicate ideas visually</li> <li>• Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools</li> <li>• Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users</li> <li>• Critique, evaluate and test their ideas and products and the work of others.</li> <li>• Identify and solve their own design problems and understand how to reformulate problems given to them</li> <li>• Select from and use specialist tools,</li> </ul>

<p>using annotated sketches, detailed plans</p> <ul style="list-style-type: none"> <li>• Select from and use specialist tools, and machinery precisely, including computer-aided manufacture</li> <li>• Test, evaluate and refine their ideas and products against a specification, considering the views of intended users and other interested groups</li> <li>• Use a variety of approaches, such as biomimicry and user-centred design, to generate creative ideas develop and communicate design ideas using annotated sketches</li> <li>• Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers and technologists</li> </ul>	<p>to design ideas</p> <ul style="list-style-type: none"> <li>• Produce specifications</li> <li>• Design for a client or environment</li> <li>• Develop an understanding of anthropometrics and ergonomics</li> <li>• Understanding manufactured boards v's natural timber</li> <li>• Understand how industry processes materials and applies surfaces finishes by hand and commercial practices</li> <li>• Explain the differences in batch and mass production</li> <li>• Explain why mass-produced products are cheaper</li> <li>• Consider and address consumer concerns including end of life plan and sustainability</li> </ul>	<p>techniques, processes, equipment and machinery precisely, including computer-aided manufacture</p> <ul style="list-style-type: none"> <li>• Test, evaluate and refine their ideas and products against a specification, considering the views of intended users and other interested groups</li> <li>• Use a variety of approaches to generate creative ideas and avoid stereotypical responses</li> <li>• Select from and use a wider, more complex range of materials and consider their properties</li> <li>• Understand and use the properties of materials such as in tie dying</li> <li>• Understand the impact of textiles on the user and the environment</li> <li>• Understand the responsibilities of manufacturing</li> </ul>
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This table provides an overview of the projects that learners will undertake on a term-to-term basis throughout the academic year.

Cloughside College - Design & Technology Key Stage 3 Projects							
	Autumn A	Autumn B	Spring A	Spring B	Summer A	Summer B	
<b>Year 7</b>	Halloween Themed Desk Tidy	Christmas Decoration	Maze Game	Phone Holder	Mood Light	Musical Money Box	
<b>Year 8</b>	Steady Hand Game	Art Movement Clock	Photo Frame	Jewellery Box	LED Desk Lamp	Memory and Reaction Game	
<b>Year 9</b>	Ergonomics and Anthropometrics	Passive Speaker	Automata Toy	Pewter Jewellery	Electro Fashion	Workspace organiser	

## Key Stage 4

At Cloughside College year 10 and 11 learners can continue or opt to study GCSE Design and Technology. This course will allow students to:

- ❖ Participate confidently and successfully in an increasingly technological world
- ❖ Gain awareness and learn from wider influences on Design and Technology including historical, social, cultural, environmental and economic factors
- ❖ Have the opportunity to work creatively when designing and making and apply technical and practical expertise
- ❖ Study core technical and designing and making principles, including a broad range of design processes, materials techniques and equipment
- ❖ Study specialist technical principles in greater depth

<b>GCSE Design and Technology</b>		
	<b>Year 10</b>	<b>Year 11</b>
<b>Autumn A</b>	<p><b>Investigation, primary and secondary data</b> Primary and secondary data, target market, ergonomics and anthropometrics, design briefs and specifications</p> <p><b>Iterative design and make project</b> Modelling and producing a product to assist with storage of clothing and/or accessories</p>	<p><b>Investigation, primary and secondary data</b> Primary and secondary data, target market, ergonomics and anthropometrics, design briefs and specifications</p> <p><b>Design strategies</b> Systems approach, user-centred design, iteration by evaluation and improvement, collaboration, avoiding design fixation.</p> <p><b>NEA</b> Complete sections A and B</p>
<b>Autumn B</b>	<p><b>Design strategies</b> Systems approach, user-centred design, iteration by evaluation and improvement, collaboration, avoiding design fixation.</p> <p><b>Communication of design ideas</b> 2D and 3D drawing techniques including systems diagrams, schematic drawings, annotation, exploded drawings, 3rd angle projection, dimensioning, using scale drawings, computer and</p>	<p><b>Core and Specialist Technical Principles</b> Recap of topics answered badly in preparation for mock exam.</p> <p><b>Communication of design ideas</b> 2D and 3D drawing techniques including systems diagrams, schematic drawings, annotation, exploded drawings, 3rd angle projection, dimensioning, using scale drawings, computer and mathematical</p>

	<p>mathematical modelling, communicating through modelling, range of techniques including freehand, crating and CAD.</p> <p><b>Focused practical task</b> Manufacturing multi-functional product from mild steel.</p>	<p>modelling, communicating through modelling, range of techniques including freehand, crating and CAD.</p> <p><b>NEA</b> Complete section C and start section D</p>
<b>Christmas</b>		
<b>Spring A</b>	<p><b>Environmental, social and economic challenge</b> Sustainable design, deforestation and how to mitigate, global warming due to product design, Fairtrade.</p> <p><b>Prototype development</b> How to develop prototypes to satisfy the brief and client requirements. Demonstrate innovation, aesthetics, ensure it is marketable, reflect critically to feedback, and use evaluation to improve.</p> <p><b>Casting with low temperature alloy</b> Design and laser cut a personalised mould for casting a key ring or pendant.</p>	<p><b>Prototype development</b> How to develop prototypes to satisfy the brief and client requirements. Demonstrate innovation, aesthetics, ensure it is marketable, reflect critically to feedback, and use evaluation to improve.</p> <p><b>Environmental, social and economic challenge</b> Sustainable design, deforestation and how to mitigate, global warming due to product design, Fairtrade.</p> <p><b>Selection of materials and components</b> Understand the difference between materials and components. Understand how to choose materials and components considering functional need, cost and availability in relation to paper and board, timber, metals, polymers, textiles, electronics and mechanical devices.</p> <p><b>NEA</b> Complete section D</p>
<b>Spring B</b>	<p><b>Selection of materials and components</b> Understand the difference between materials and components. Understand how to choose materials and components considering functional need, cost and availability in relation to paper and</p>	<p><b>Mock exam preparation</b> Address common misconceptions from the previous mock exam and prepare for the forthcoming exam.</p> <p><b>Tolerances</b></p>

	<p>board, timber, metals, polymers, textiles, electronics and mechanical devices.</p> <p><b>Tolerances</b> Understand what tolerances are and how products can still function as intended even if they are not the exact size. Tolerances in industry and quality control.</p> <p><b>Focused practical tasks in wood, polymers and microelectronics</b> Develop skills in working with a wide range of materials and equipment but undertaking a range of focused practical tasks.</p>	<p>Understand what tolerances are and how products can still function as intended even if they are not the exact size. Tolerances in industry and quality control.</p> <p><b>NEA</b> Sections E and F.</p>
<b>Easter</b>		
<b>Summer A</b>	<p><b>Material management</b> Minimising waste, stock sizes, seam allowance, joint overlap, measuring, datum points, production aids (jigs/templates etc.), tessellation, calculating material area and volume, calculating costs, using CAD for efficient layout</p> <p><b>Understanding command words</b> Discussion of different styles of questions and model how to answer using teaching sequence for writing.</p> <p><b>Iterative design and development project</b> Develop an item of kitchen equipment for specific user requirements. Emphasis on iteration, evaluation and strategies to avoid design fixation and improve ergonomics and anthropometrics.</p>	<p><b>Material management</b> Minimising waste, stock sizes, seam allowance, joint overlap, measuring, datum points, production aids (jigs/templates etc.), tessellation, calculating material area and volume, calculating costs, using CAD for efficient layout</p> <p><b>Revision and past papers</b></p>

<b>Summer B</b>	<p><b>Core Technical Principles</b> Revisit topics relating to CTP in preparation for the assessment.</p> <p><b>Start NEA</b> Responding to context from AQA (issued 1/6/2022) students will undertake Section A of the NEA, worth 50% of the GCSE grade.</p>	<b>Final exam</b>
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At Cloughside College learners at KS4 and Post 16 can follow an alternative pathway if not studying at GCSE or 'A' Level in Design and Technology. For enrichment and recovery learners can complete AQA Unit Awards or Open Awards.

The AQA unit awards scheme is a unique way to record learner achievement. It's 'can do' approach is used to boost student confidence, engagement and motivation.

Examples of units that are studied in Design and Technology are:

- ❖ Making a Bug House
- ❖ Designing and making a clock
- ❖ Making a wooden jewellery box
- ❖ Making a working radio
- ❖ Build a football table from recycled materials
- ❖ Making a wooden bird box
- ❖ Making garden furniture from a wooden pallet

The Open Award scheme's primary purpose is to prepare learners for further learning or training. It offers a starting point for vocational education and training and offers a mix of personal development and employability skills alongside an introduction to a range of vocational sectors.

Examples of units that studied in Design and Technology are:

- ❖ Design Project
- ❖ Carpentry and Joinery Skills
- ❖ Know How to Produce Basic Woodworking Joints
- ❖ Woodworking Skills
- ❖ Maintain and Use Carpentry and Joinery Hand Tools
- ❖ Prepare and Use Carpentry and Joinery Portable Power Tools
- ❖ Developing Enterprise Skills
- ❖ Undertaking an Enterprise Project
- ❖ Computer Aided Design