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Curriculum Overview: Design & Food Technology

Principles and Purpose of the Design Technology Curriculum

Design and Technology is an inspiring, rigorous and practical subject. It is one that gives students the opportunity to embed cross-curricular skills from Maths, Science and The Arts, giving them real life applicability. It promotes independent learning in an arena where students can take ownership of their work to become resilient, creative risk-taking, process aware and driven individuals. Using creativity and imagination, students design and make products and dishes that focus on their functional skills and enhance their practical abilities in the workshop and kitchen. These 'traditional' elements are developed in parallel with advancements in the subject, not only in relation to ever changing technologies, but also through reflection upon current social and environmental issues.

Students solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They expand their awareness towards the wider world making them better informed consumers with responsibility for their own choices and actions.

The curriculum aims to ensure that all students are given the scaffolding needed to be able to participate successfully without fear of failure. Problems become opportunities as students are supported in performing iterations and learn the importance of being able to critically analyse and evaluate their own work and the work of others.

Why this, why now?

Our Design Technology Curriculum has been carefully sequenced to introduce students to a variety of creative and practical activities, increasing in complexity, enabling them to utilise and build upon prior knowledge in future projects. Pupils are taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. Throughout the sequencing of projects students are given more autonomy to explore a wider range materials and design skills.



Term 1	Autumn 1 & 2	Why this, why now?
Year 7	Product Design Pull Along Toy	<p>This project introduces students to the workshop and core designing and making principles. They are informed of health and safety precautions and begin to develop their practical making skills. These skills are revisited and built upon throughout KS3 and 4. The project teaches creativity while working to a specification to meet the wants and needs of a specific target market.</p> <p>Students will be introduced to the iterative design processes by developing to come up with a finished piece developing their own design ideas based on peer feedback. They will expand on their problem-solving skills along the way whilst making their wooden toy in the workshop using a variety of tools and equipment. Precision and accuracy play an important role in insuring that their end product meets the design specification and the needs and want of their target market.</p>
Year 8	Food technology - World Cuisines and Food Safety	<p>This module develops the students' understanding of food safety and hygiene focusing on preparing and cooking food with the understanding of how to prevent the risk of cross contamination and food borne illnesses.</p> <p>Student should be able to;</p> <ul style="list-style-type: none"> • Recognise the different types of micro-organisms that cause food spoilage • Raise awareness of the different types of bacteria and the conditions required for bacterial growth – Danger zone • Identify the causes and symptoms of food poisoning • Apply understanding of food safety rules to prevent cross contamination in practical work <p>In addition to food safety this module introduces differing global cuisines. Students will learn to distinguish characteristics and traditions related to foods from global cultures and cuisines from around the world, including Italian, French and Bulgarian. Chosen dishes from the cultures learnt will then be cooked during practical lessons to embed knowledge and understanding whilst demonstrating food safety knowledge.</p>
Year 9	Product Design - Chocolate Bar Project	<p>Students incorporate a wide range of designing and making skills learnt throughout KS3 in this module, it combines designing and practical skills both in the kitchen and in the workshop.</p> <p>This project serves as a continuation of the use of the iterative design process, but in more depth. Students analyse products to inform their own designs, choose their own target market and take their drawing skills to the next level with effective use of typography and graphic design, which is</p>



		<p>learnt during this unit. Students advance their knowledge of computer aided design, transferring their packaging design for their chocolate bars into digital drawings using CAD software. Students work with a variety of tools with competency through experience of using them in prior projects. They are required to create a wooden mold for their chocolate bar which is vacuum formed. This mold is then used to create the chocolate bar itself in the kitchen where students can further demonstrate their knowledge of food safety learning in year 8.</p>
<p>Year 10</p>	<p>3.1 Core technical principles new and emerging technologies energy generation and storage developments in new materials</p>	<p>The AQA Design and Technology subject content is taught throughout Year 10 and runs parallel to two design and make projects in terms 2 and 3.</p> <p>The first topic studied in year 10 is new and emerging technologies. Knowledge learned here can be applied in projects throughout year 10 and the NEA next year when considering how products might be made commercially. Energy generation and storage is studied in this term as students begin to develop a deeper understanding of how products are manufactured and their impact on the world. It is imperative that students embed this knowledge from the start of the course as they will need to consider if their product is environmentally friendly, if the materials being used are from a renewable source, and what might happen to their product at the end of its life.</p> <p>As students begin to embed a greater understanding of the core principles of design technology, we look at smart, new and modern materials, again this knowledge can then be applied when designing products and accumulating innovative ways of problem solving through product design . We study this at this point as it widens students' knowledge of materials and when suggesting ways in which their designs could be further developed, they have a knowledge of a wider range of materials available that they could consider using in future designs. Students also have the opportunity to use some smart materials such as thermochromic pigmented paper and polymorph for modeling.</p>
<p>Year 11</p>	<p>NEA Sections A, B and C Section A - Identifying and investigating design Possibilities Section B - Producing a design brief and specification Section C- Generating design ideas</p>	<p>Students will have a clear understanding of the elements required to successfully carry out their NEA including; research and investigation, composing a design brief and specification, generating ideas, developing and modelling ideas, the iterative process and how to test and evaluate products. Sections A-F should be evident and flow throughout their portfolio of work however the structure is focused on in sections. This does not limit the student in progressing forwards.</p> <p>As any form of designer, it is imperative to research before starting any new projects. The first aspect of the NEA therefore is research based. Students are required to undertake extensive research to help identify problems and opportunities for improvement in their chosen context, of which they have 3 to choose from. They will look at existing products to support the development</p>



		<p>of their own ideas and gain information on what products and/or services already exist in their chosen area of interest. Primary and secondary research must be evident and may include references from books, online resources, self-conducted surveys, questionnaires and interviews.</p> <p>This research will help to identify their user clients' needs and wants so that they can successfully fulfill their design brief and specification. The students are required to produce their own design brief and specification based on the research and development of ideas they have begun to formulate. These should both be referred to throughout the NEA alongside the aspects of their design ideas that link to meeting their user clients' needs and wants. Students will begin to realise and develop their design ideas in section C based on their continuing research and findings.</p>
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Term 2	Spring 1 & 2	Why this, why now?
Year 7	Food and Nutrition Core principles:	In this module students are introduced to the fundamentals of food and nutrition, basic cooking skills and the <i>Eatwell Guide</i> in order to make more informed choices of food and develop healthier eating habits. The practical sessions are to ensure safe use of the oven and hob, boiling and simmering plus safe use of knives.
Year 8	Young Explorers Context and Communication Challenge	<p>This module moves them closer to the world of product design. Students will develop a wider range of design skills that they will be able to apply throughout DT projects to communicate their ideas effectively. These include orthographic and isometric projection as well as detailed effective use of annotations and producing accurate measurements.</p> <p>They will explore a range of different contexts and start to recognise problems and opportunities that exist within them. This aims to develop their analytical and problem-solving skills. Students will follow cyclic iterative design process taking feedback on board, critically evaluating their own work and amending where necessary.</p>
Year 9	Young Explorers – Architecture- Focus on a Designer	<p>The year 9 project aims to improve student's 2D and 3D drawing accuracy and design skills by focusing on higher level methods of technical drawing, including 2- and 3-point perspective drawing and creating a, to scale building floor plan with architectural symbols.</p> <p>Students are required to take into consideration their chosen clients' needs and wants to give them more autonomy of their design choices than previous projects. Recognising and researching a chosen clients' needs and wants is required at GCSE, embedding an understanding of this now will be beneficial to those students who chose to take DT at GCSE.</p>



<p>Year 10</p>	<p>Design and make- Ergonomic Lamp</p> <p>3.2 Specialist technical principles</p> <ul style="list-style-type: none"> • selection of materials or components • forces and stresses • ecological and social footprint • sources and origins • using and working with materials <p>3.2 Specialist technical principles</p> <ul style="list-style-type: none"> • stock forms, types and sizes • scales of production • specialist techniques and processes • surface treatments and finishes. 	<p>Students cover a range of commercial and practical processes in this section alongside designing and making an innovative ergonomic lamp. The rationale behind this is to learn the required theory alongside embedding this knowledge through practical implementation of the content learnt.</p> <p>The students develop a greater understanding of a wider range of materials and how they respond to different forces and stresses, they can then apply this knowledge when making design decisions for their lamp and apply this to their NEA in year 11.</p> <p>Students are gaining more independence with their making skills, becoming more confident with tools and machines and working on producing a final product in a similar way to how they will have to for their GCSE NEA project.</p>
<p>Year 11</p>	<p>NEA Sections D, E & F</p> <p>Section D- Developing design ideas</p> <p>Section E- Realising Design ideas</p> <p>Section F- Analysing and evaluating</p>	<p>In term 2 students should have a clear understanding of their user clients' needs and wants and should have recognised a multitude of problems and/or opportunities for improvement in their chosen context. The natural progression following this is developing their ideas through a range of different design strategies learnt and practiced in Year 10.</p> <p>Students should use a wide range of 2D/3D techniques to develop a prototype. Students should demonstrate their excellent modelling skills, using a wide variety of methods to test their design ideas as they would have practiced in year 10 and would have to also do at A-level.</p> <p>Fully appropriate materials/components should be selected with extensive research into their working properties and availability. A fully detailed manufacturing specification should be produced with comprehensive justification to inform manufacture as this would be required in industry.</p>



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		<p>A high level of quality control should be evident to ensure the prototype is accurate by consistently applying very close tolerances. This is a skill that students would be able to apply moving forward in any design industry. This is also relevant to the theory content of the course. Students should have extensive evidence that various iterations are as a direct result of considerations linked to testing, analysis and evaluation of the prototype, including well considered feedback from third parties.</p> <p>Excellent ongoing analysis and evaluation should be evident throughout the project that clearly influences the design brief and the design and manufacturing specifications.</p> <p>Almost all aspects of the NEA require knowledge of the theory content of the course. Year 11 allows students to apply their knowledge through practical application of the theory content taught in year 10.</p>
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Term 3	Summer 1 & 2	Why this, why now?
Year 7	Young explorers- Inclusive design Project	<p>This module introduces students to the cyclic iterative design process that will be fundamental to all DT projects throughout Ks3 and 4. They learn about what fixation is and how to avoid it, enabling them to create innovative and unique ideas in future design projects. They are introduced to a specific target market of the aging population and learn to empathies with their users' needs and want to help them produce inclusive products. Students learn about ergonomic design which supports them when producing inclusive products, something that should be considered in all design projects moving forwards.</p>
Year 8	Product Design Maze Project	<p>In this project students will apply knowledge learnt in year 7 of timbers and their working properties. They will be required to use similar workshop tools and equipment to produce their finished product of a maze toy that requires extra precision and accuracy in order to be assembled and finished to a high standard.</p> <p>This project also introduces polymers as a specialist material and incorporates the use of basic 2D computer aided design and manufacture to engrave their design work onto acrylic. The students continue to revisit the iterative design process and undertake prior research into a choice of target markets.</p>



Year 9	<p>Food technology – Nutritional need and dietary requirements</p>	<p>This module develops further understanding of the Eatwell Guide focusing on making changes to the diet and meeting individual nutritional needs and understanding specific dietary requirements. Students will apply their knowledge of food hygiene and safety in the practical lessons alongside demonstrating their skills using a wider range of kitchen equipment. Students will have more autonomy in year 9 with the opportunity to design their own dishes based on the theory content learnt during the module.</p>
Year 10	<p>Design and make – Inclusive product.</p> <p>3.3 Designing and making principles</p> <ul style="list-style-type: none"> • investigation, primary and secondary data • environmental, social and economic challenge • the work of others • design strategies • communication of design ideas <p>3.3 Designing and making principles</p> <ul style="list-style-type: none"> • prototype development • selection of materials and components • tolerances • material management • specialist tools and equipment • specialist techniques and processes. <p>NEA Introduction</p>	<p>Students will build upon their prior knowledge of investigatory research tasks undertaken in KS3 to gather information on chosen target audiences and clients. This section of the course expands students' understanding of a wider range of audiences, their varying needs and the social, economic and environmental factors that need to be taken into consideration when designing a new product or service. Further to this they will learn about key influential designers from various backgrounds to help inspire the work of their inclusive design project.</p> <p>Students learn about different design strategies such as collaboration and user centered design alongside the design and make project so they can embed their theory knowledge through real practice.</p> <p>Students are required to create a high-quality accurate prototype of their product, alongside a body of design work full of iterations that clearly communicate their ideas. Consideration of the manufacturing techniques, materials components used, and an understanding of specialist tools and equipment will be required to show their understanding of the theory learnt throughout the term. This theory knowledge will be revisited in year 11 and is a component of the course content for the written exam paper in year 11.</p> <p>This project is designed in a way that mimics the expectations and structure of the NEA aspect of the course.</p> <p>NEA (project): Section A: Investigating the context</p> <p>In the final half term of year 10, students will begin their GCSE NEA (non exam assessment) project worth 50% of their grade. The contexts are released by the exam board on June 1st, and the focus is on analysing and researching the task before the summer holidays so discussions around their design idea can be had over the summer holidays, and students return in year 11 to embark on the designing and making sections.</p>
Year 11	Revision for GCSE exams	With the NEA completed and handed in, focus turns to examination theory where revision of topics covered though out year 10 continue to be revisited.



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