

Design & Technology Curriculum Intent

Learning Journey - Design & Technology

KS3

At Key Stage 3, we operate a rotation system whereby students spend each term covering particular subject areas with different specialist teachers, thus allowing students to experience a wide range of topics in D&T. We aim to meet all the demands of the National Curriculum for Design & Technology.

Our curriculum is accessible to all students through a range of opportunities and challenges, which engage students of diverse abilities, talents and backgrounds. Students are encouraged to be motivated, confident learners, as well as developing key skills in problem solving. Furthermore, students learn to work both independently and in groups. These skills allow students to begin preparing for work within a number of disciplines, particularly industry and academia, but also encourages development of collaborative practice.

Projects are based around 'Design & Make' activities, covering a range of contexts and materials. Each project also aims to build technical knowledge and develop students' ability to analyse and evaluate their own work. These projects encourage and support students to make links between their designs and different designers, throughout history, therefore allowing students to find inspiration from all aspects of design, but also to critically reflect upon and evaluate their designs.

Skills and knowledge from all curriculum areas will be used to underpin, support and reinforce learning in the department and we aim to link work to other disciplines working under the STEM umbrella (Science, Technology, Engineering & Mathematics), with a particular focus on Numeracy and Literacy during the design and making process.

We assess projects termly and monitor progress regularly, ensuring that by the end of the key stage, students have:

- Developed a critical understanding of the impact of Design & Technology on daily life and the wider world.
- The ability to apply a repertoire of knowledge, understanding and skills in order to design and make high-quality products for a wide range of users and evaluate and test their ideas and products.
- An understanding and ability to apply the principles of nutrition and how to cook.
- Developed the creative, technical and practical expertise needed to perform everyday tasks confidently.

All students in Year 9 study this subject as well as having the option to develop their skills and understanding further by selecting D&T as an enrichment option. Students continue to study National Curriculum content and develop transferable skills and foundation knowledge in order to support the transition to KS4 and GCSE study in Year 10.

KS4

AQA GCSE Specification

The Key Stage 4 curriculum builds on the skills and knowledge and understanding learnt at Key Stage 3, giving students the opportunity to combine practical and technological skills with creative thinking to design and make products that meet human needs and real-life problems. Students have the opportunity to explore designing and making products that address current, modern, and real-world issues, such as healthcare, developing communities and protecting people.

Students learn to use current technologies, while also considering the impact of future technological developments. Students will be encouraged to explore contextual challenges and develop prototype solutions, using a combination of hand tools, machinery, CAD/CAM and other computer-based tools. In addition, students will continue to develop in-depth theoretical knowledge and understanding.

	Throughout Key Stage 4, students are assessed each half term based on their current project work. Formative assessments take place throughout lessons with opportunities for reflection [PreACT] and improvement [ReACT] before completing summative half-termly assessments. Students will have the opportunity to explore career prospects within the field of Design, including further and higher education courses and apprenticeships, design-based careers, electro/mechanical engineering, architecture, carpentry, CAD/CAM, the renewables industry, among many others. Furthermore, the skills acquired through Design & Technology are also key life skills that can be applied to any avenue of life and work.
KS5 <u>AQA A Level Specification</u>	During A Levels, the initial focus is to develop skills and knowledge acquired and built on during GCSEs to a greater depth, particularly in regards to technical knowledge and students' ability to critically evaluate their own work and the work of others, and to justify their choices in the process of designing and making. Product Design requires students to engage in both practical and theoretical study. They will investigate historical, social, cultural, environmental and economic influences on design and technology, whilst enjoying opportunities to put their learning into practice by producing prototypes of their design. This creative and thought-provoking qualification gives students the practical skills, theoretical knowledge and confidence to succeed in a number of careers. Especially those in the creative industries. Students will gain a real understanding of what it means to be a designer, alongside the knowledge and skills sought by higher education and employers.

Design & Technology Curriculum Implementation						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7	Baseline test (at start of DT group rotation). 13 Weeks Project - Designing & Making skills: Industrial Pairing Project - Introduction to Materials and Uses. Selection and use of a range of workshop tools. Evaluation and testing of the made product.	13 Weeks Project - Designing & Making skills: Marble Run Project. To know how to fix together different materials. To know how to use specialist tools and equipment. To know and understand different	Food & Nutrition	Food & Nutrition	13 Weeks Project Electronics Dice project. Applying iterative design to the design and make process. Developing an understanding of the work of others, and how to engage in critical appraisals of work. Learning and understanding the need	13 Weeks Project Electronics Dice project. Introduction to manufacturing and production, including Vacuum Forming and assembly of components. Sequencing work. Order and Planning. Evaluations. QA & QC.

	To know how to research a context. To know how to identify a client's/user needs and wants. To know how to write a design specification. To know how to draw in 3D. To understand how to communicate design ideas.	types of paper and boards & woods and their properties. To know and understand how to ensure accuracy and quality assurance in products, as well as joining and assembly of products. To know and understand finishing techniques.			for and using research to develop ideas. Learning to use Computer Aided Design to further develop ideas.	
Year 8	13 Weeks Project Designing skills: Clock Project. Designing using research and styling products for a market. Use of Accurate 2D design, batch production line bending. Creating annotated design sheets. To know how to carry out research independently using different sources of information. To know how to draw on and use research by means of a specification to help influence and create design ideas. To use models and drawings when developing ideas. To be able to draw ideas in isometric and in orthographic view.	13 Weeks Project Making skills: Clock Project. Designing using research, styling products for a market. Use of Accurate 2D design, batch production line bending. To be able to work with a range of tools and equipment, processes and materials. To know how to make a high-quality working product. To know the importance of planning and time keeping. To know the importance of maintaining traditional skills as part of a culture/country's heritage. To know how to produce and design an advert to promote/sell a product.	Food & Nutrition	Food & Nutrition	13 Weeks Project Designing skills: Wildlife and Bug Hotel Project. To know and understand the process of design fixation. To understand the impact of social and economic change on the design process. To know of the evolution of iterative design and understand the role of collaboration and user-centred design.	13 Weeks Project Making skills: Wildlife and Bug Hotel Project. Be able to recognise and characterise different types of timbers. Understand how the physical and working properties of a range of timber products affect their performance. To know how to make a high-quality working product. To know the importance of planning and time keeping. To know the importance of maintaining traditional skills.

Year 9	Designing: Trophy Project. Design decisions are documented and justified with regular reference to the design brief, specification and investigations. The student will demonstrate evidence of originality, creativity and a willingness to take design risks. Modelling techniques support ongoing development work throughout the project. Ongoing development of design proposals, achieved through exploration of and experimentation with different materials, techniques and processes leading to an excellent quality design.	Manufacturing: Trophy Project. Product Design & Make, and a variety of creative and practical tasks undertaken to develop designer/maker skills. Develop skills in model making and freehand sketching in 3D. Understand and apply different production techniques such as bend and laminate plywood. Focus to demonstrate creativity.	Shelter Project - Architecture. Know the primary sources of materials for producing papers and boards. Be able to recognise and characterise different types of papers and boards. Understand how the physical and working properties of a range of paper and board products affect their performance. Knowing how to write a specification from a client. Understanding how to use 'ACCESSFM' to carry out a Product analysis.	Shelter Project - Bridges. Develop skills in concept sketching, rendering, product evolution, aesthetics and design influences. Apply 3rd angle orthographic drawing, perspective drawing, exploded drawing, inclusive, exclusive approach to design and make. Looking at stress and loads and understanding the impact of these concepts on the designing and making process.	PinBall Machine: Focused Practical Task. Consider different aspects of systems and control. Understand the process of construction, testing and modification. Be able to recognise and characterise different types of timbers. Understand how the physical and working properties of a range of timber products affect their performance. Understand the process of design fixation.	PinBall machine Project: Ergonomics. To know and understand the concept of standardised components. Understand the design process within the context of sustainability. To know and understand the use of different mechanisms, such as pulleys, levers, gears, belts, etc. To know and understand the life cycle of a product.
Year 10	Designing skills workshop. Polymers Project: Promotional Gift. Identifying and investigating design possibilities. Producing a design brief and specification. Generating design ideas. Analysing & evaluating designs and products.	Making Practical skills workshop. Polymers Project: Promotional Gift. Developing design ideas. Analysing & evaluating design and products. GCSE Theory: <i>Core technical principles:</i> Energy, materials, systems, devices.	Mini NEA Industrial Design Skills - working with industry. Metals Project: Balance Executive Toy. Identifying and investigating design possibilities. Producing a design brief and specification. Generating design ideas.	Production & Manufacturing Skills. Metals Project: Balance Executive Toy. Realising design ideas. Analysing & evaluating design and products. GCSE Theory: To know how to investigate and research, and know how to, implement primary and secondary data.	Production & Manufacturing Skills. Metals Project: Balance Executive Toy. GCSE Theory: To know how to investigate and research, and know how to, implement primary and secondary data. Understand the social and economic challenges in design.	Board Topic release for the Non-exam assessment (NEA) - 50% (based on approx 30–35 hours). Students will produce a prototype and a portfolio of evidence. This will be a substantial design and make task, and will also involve assessments, recap of information and course content, retrieval

	GCSE Theory: <i>Core technical principles:</i> New & Emerging technology. Materials and their working properties. Assessments are set each half term, and assess new and previous knowledge.	<i>Specialist technical principles:</i> Selection of materials or components. Understand forces and stresses, and the impact on chosen materials. Understanding the ecological and social footprint of the design & make process, and ensuring a sustainable approach to the design & make process. To know and understand the sources and origins of materials being used, and working with materials stock forms, types and sizes. Understand scales of production. To know and understand specialist techniques and processes surface treatments and finishes.	Analysing & evaluating design ideas and products. GCSE Theory: To know and understand the role of papers and boards, timber-, metal-, and textile-based materials, polymers and electronic and mechanical systems in the design and make process.	Understand the social and economic challenges in design. To know and understand the use of design strategies and communicate design ideas. To understand to process of prototype development, selection of materials and components, material management, and the use of specialist tools and equipment and specialist techniques and processes.	To know and understand the use of design strategies and communicate design ideas. To understand to process of prototype development, selection of materials and components, material management, and the use of specialist tools and equipment and specialist techniques and processes.	practice and exam practice.
Year 11	Produce design ideas using Customer profile, Design Brief and Design specification. Week 3 - Design Exam Review and reworking of design ideas.	Continued work on projects. Students will continue working on their projects, and work will be largely student led. Students will be provided with sample work, an example project, assessment	Development of prototype based on design ideas (intent). Testing and evaluation of prototype idea. Final testing and evaluation. Project submission.	Further development of prototype (sketch, modelling, CAD). Final design and manufacturing plan. Materials testing & testing against the specification.	Written examination (50% of total assessment - 2 hours). Section A – Core technical principles (20 marks) - A mixture of multiple choice and short answer questions, assessing a breadth of	Section C – Designing and making principles (50 marks) - A mixture of short answer and extended response questions.

	Developing and building on skills in using CAD, modelling and investigation. Selection of key/primary idea to develop. Continue developing understanding of appropriate materials for the making process; investigate possible materials and making methods. Preparation for mock examination (full 2 hour paper) Assessments are undertaken each half term, assessing new and previous knowledge.	criteria, and will be expected to adhere to a series of mini-deadlines. Pupils will then drive their own projects forward aiming to meet each of the deadlines. By the end of this term pupils will have completed the following sections: Initial Ideas (sketch, annotation, research), Development 1 (sketch, model, CAD), Development 2 (sketch, model, CAD), Evaluation of own development, Further development (modelling), and Further research Materials testing.		Client feedback and their evaluation. Testing and conclusion NEA: Work will be marked by teachers and moderated by the exam board.	technical knowledge and understanding. Section B – Specialist technical principles (30 marks) - Several short answer questions (2–5 marks) and one extended response to assess a more in depth knowledge of technical principles.	
Year 12	Year 12 A 'Level D&T Product Design — taught in specialist technical workshops and ICT suites. Initial focus is to develop GCSE knowledge and skills, particularly in regard to technical knowledge and ability to discriminate information and justify decisions/choices.		Develop greater understandings of performance characteristics of a range of materials, as well as alternative methods of joining materials permanently and semipermanently. Continue developing skills in Computer Aided Design and Manufacturing, which will contribute a		Continue developing CAD/CAM skills and begin Non-Examination Assessment (NEA). The theme for the NEA will be chosen by the student who will also develop their own design brief. Homework will continue to look at exam questions and exam technique. This will be reviewed in the classroom.	

	Developing and continuing an understanding of main materials and processes: Woods, Metals, Plastics, Textiles etc. Continue to develop an understanding of Designers and Design Movements, and consider the factors influencing the development of products. Making skills will be refined through focused practical tasks and a Design and Make project. Further and additional theory will be covered through homework, through the same medium, students will begin looking at exam questions and technique.		significantly to skills development. Continue carrying out focused practical tasks to refine your making skills, as well as through a Design and Make project - manufacturing an architectural model. Homework will continue focusing on exam questions and exam technique. This will be reviewed in the classroom.			
Year 13	Year 13 A 'Level D&T Product Design — taught in specialist technical workshops and ICT suites. Continue with subject content, but focus shifts to final coursework project (Non-Examinable Assessment [NEA]). The course is 50% NEA and		Focus shifts to cleaner design and sustainable development, with consideration given to minimising energy use during manufacture and distribution. NEA should be at the stage of manufacturing, and a recorded photographic diary should be kept to		Completion of the NEA , with a final evaluation and testing. Main focus will be on exam preparation, looking back at accumulated knowledge and aiming to identify and fill any gaps in knowledge and applying knowledge to exam questions.	

	50% written examination. Looking at features of manufacturing industries for example scales of production, quality assurance and quality control, as well as methods of protecting intellectual property, such as copyright, patents, trade marks, and legislation, including Consumer Rights and Health & Safety. The NEA should be at the specification and design idea and development stage. Homework will cover additional theory, refresh things already learned and begin to look at exam questions.		illustrate key points and aspects of the manufacturing process. Homework will be looking at exam questions and exam technique. This will be reviewed in the classroom.		Students will have already been focusing on exam preparation, but with completion of their NEA, exam preparation will become the primary focus.	
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Assessment Maps

KS3

<https://docs.google.com/document/d/1mDP60piAPiTmacwSunU0AWewRA7RPEkPb6wgLozD82k/edit>

KS4.5

<https://docs.google.com/document/d/1g4wjzRLXXT2UX8exwIK8vOJAsmX6Gns0PcjpO8R9cA/edit>

