




Design Technology
Key Stage 4
Curriculum Overview


Key Stage 4 Curriculum Journey: GCSE Design Technology

Y10	Week 1  Week 39			
	Materials and Properties Common Specialist Technical	Designing and Making Principles	Specialist Units	NEA
Key content (know that...know how...)	<p>Introduction to the course</p> <ul style="list-style-type: none"> Exam and NEA run down Content and topic coverage <p>Materials and their properties</p> <ul style="list-style-type: none"> Recap general material applications from KS3 Recap material sources and uses (Linked to KS3) Paper and board Timbers Metals Polymers Textiles General of materials in everyday (Research and evaluate) Working and physical properties of materials Unit assessment <p>Phone Holder – Practical</p> <ul style="list-style-type: none"> Recap workshop safety (KS3) – Risk assessment Tools and equipment used in KS3 and introduction to new tools used in Engineering Marking out Joints Cutting and shaping Filing and drilling 	<p>Designing Principles</p> <ul style="list-style-type: none"> Investigation – Primary and secondary data -Understand how primary and secondary data can be collected to assist the understanding of client and user needs Know how to write a design brief and produce a manufacturing specification The work of others – Designers - Understand how investigating the work of other designers can inform designing The work of others – Companies - Understand how investigating the work of other design companies can inform designing Designing strategies - Understand how to explore and develop design ideas Unit assessment <p>Making principles</p> <ul style="list-style-type: none"> Selection of material and components - Understand how functionality, availability and cost 	<p>New and Emerging Technologies</p> <ul style="list-style-type: none"> Industry and enterprise - Understand the impact of new and emerging technologies on the design and organisation of the workplace and tools and equipment Sustainability and the environment - Understand how the environment can be protected by responsible design and manufacturing positive and negative impacts new products have on the environment People culture and society - Understand changes in job roles due to the emergence of new ways of working Production techniques and systems - Understand how Just in Time (JIT) and Lean Manufacturing contribute to manufacturing efficiencies Informing design decisions - Understand how products can be designed to be repaired and recycled 	<p>NEA – June - Context released for the students</p> <p>Run through the brief from the exam board and develop plan for the project and the possible design solutions</p> <ul style="list-style-type: none"> NEA introduction and initial research NEA Research analysis NEA Design ideas NEA prototyping

<ul style="list-style-type: none"> • Vacuum forming • Laser cutting and line bending plastic • CNC vinyl cutting • Finishing and final assembly <p><u>Common specialist technical principles</u></p> <ul style="list-style-type: none"> • Forces and stresses • Improving functionality - Understand how materials may be enhanced to resist and work with forces and stresses to improve functionality • Ecological and social footprint • Six R's • Scales of production • Unit Assessment 	<p>affect the selection of materials and components</p> <ul style="list-style-type: none"> • Tolerances – Understand what and how to ensure accuracy and what tolerance is applied • Material management – Accuracy of marking out to create a prototype and how to minimise waste • Surface treatments and finishes – Appropriate treatments for different materials and uses. <p><u>Designing for others – Practical project</u></p> <ul style="list-style-type: none"> • Research in to design brief • Moodboard and primary / secondary research • Initial design ideas and sketches • Prototype modelling – Understanding how to use card and foam to present ideas • Development and presentation of idea • Analysis of idea against specification • Use of CAD / CAM to further develop idea 	<p><u>Energy, Materials, Systems and Devices – Practical elements fed throughout *</u></p> <ul style="list-style-type: none"> • Energy generation – Non renewable - Fossil and nuclear fuels. Renewable sources; wind, solar, tidal, hydroelectric and biomass. • Energy storage – Batteries and their uses. • Modern materials – How they can change to alter their function / Linked to smart materials • Smart materials – Hydro / Thermo / Electro • Composite materials (Further development of KS3 knowledge. • Systems – Electronic systems. Flowcharts and block diagrams to help solve a problem. • Electronics - How development of components have changed products and their uses <p><u>*Mechanical devices</u></p> <ul style="list-style-type: none"> • Understand how mechanisms can be used to change magnitude and direction of force, including levers, linkages and rotary systems – Cardboard practical project. Students to develop different mechanisms and linkages which link together to develop a moving part / project 	
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Prior Knowledge	<p><u>Introduction to the course</u></p> <ul style="list-style-type: none"> Options information evening Speaking to staff and other students on the course <p><u>All Materials theory – General Application and uses (Multi materials) – Properties</u></p> <ul style="list-style-type: none"> Recap general material applications Recap material sources and uses Mixed material products General applications of materials in everyday (Research and evaluate) Working and physical properties <p><u>Phone Holder – Practical</u></p> <ul style="list-style-type: none"> Use of tools and equipment – Linked to KS3 practical learning General understanding of health and safety and risk assessment Names of tools and their applications and materials to be used on General assembly Use of motor skills Computer literacy and following set instructions <p><u>Common specialist technical principles</u></p> <ul style="list-style-type: none"> Forces and stresses learned at KS3 – basic understanding of what they are and how they act 	<p><u>Designing Principles</u></p> <ul style="list-style-type: none"> How to gather information – Use of the internet and reading extracts from a variety of sources Literacy – Use of key words and writing lists Names of designers and work of well known designers they may have learned in art or through fashion / general life Names of different companies they may know who have designed / developed something Drawing and sketching techniques learned through KS3 <p><u>Making principles</u></p> <ul style="list-style-type: none"> Use of tools and equipment – Linked to KS3 practical learning General understanding of health and safety and risk assessment Names of tools and their applications and materials to be used on Maths skills – how to read a ruler and calculate plus and minus Tessellation of shapes to fit on to a page – Maths Names of different finishes to materials – KS3 recall or general understanding of finishes 	<p><u>New and Emerging Technologies</u></p> <ul style="list-style-type: none"> Name of different types of technology that could be used to manufacture products How products are made What is sustainability – Link back to KS3 when learning about the 6R's Understanding of how some technology has changed in their lifetimes – Speaking to parents about how technology has changed in their lifetime RE – Understanding of different cultures What does society mean and the different levels of society. Understanding of how technology can impact the environment <p><u>Energy, Materials, Systems and Devices – Practical elements fed throughout *</u></p> <ul style="list-style-type: none"> KS3 knowledge of how energy is created – science / geography knowledge What is a battery and its use How to draw a flowchart and their use – Reading of instructions or from computer science lessons Electronics and component knowledge – KS3 science / design tech prior knowledge <p><u>*Mechanical devices</u></p>	<p><u>NEA – June - Context released for the students</u></p> <ul style="list-style-type: none"> No prior knowledge of the NEA context Recapping skills learned in KS3 and now KS4 to apply to the brief Recap materials and different methods of manufacturing
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	<ul style="list-style-type: none"> Improving functionality – Evaluation of existing products from KS3. Basic understanding of how products work. Understanding of the environment and how we can help climate change. Reduce / Reuse / Recycle. Basic understanding of pollution. Six R’s – Learned knowledge from KS3. Recall. Scales of production – Batch / Mass / One off. Understanding those key words and what they may mean. This then linked to production. Unit Assessment 	<p><u>Designing for others – Practical project</u></p> <ul style="list-style-type: none"> Literacy skills – writing lists and reasoning judgements Maths – Calculating sizes Computer skills – use of a computer to research Use of mouse / CAD software Use of scissors and craft knives – modelling / making Designing / use of drawing equipment Use of basic tools to disassemble a product and then put back together 	<ul style="list-style-type: none"> How products work and move – understanding from KS3 or prior / working knowledge Use of tools and equipment – Linked to KS3 practical learning General understanding of health and safety and risk assessment Names of tools and their applications and materials to be used on General assembly 	
Assessment Objectives	<p>AO1: Identify, investigate and outline design possibilities to address needs and wants.</p> <p>AO2: Design and make prototypes that are fit for purpose.</p> <p>AO3: Analyse and evaluate:</p> <ul style="list-style-type: none"> Design decisions and outcomes, including for prototypes made by themselves and others Wider issues in design and technology. <p>AO4: Demonstrate and apply knowledge and understanding of:</p> <ul style="list-style-type: none"> Technical principles Designing and making principles. 			
Assessments	<p>AO2 / AO4 – Practical Assessment</p> <p>AO1 / AO4 - End of unit assessment – Test based knowledge</p>	<p>AO3 – Analyse and evaluate existing products</p> <p>AO1 / AO4 - End of unit assessment – Test based knowledge</p>	<p>AO2 / AO4 – Practical Assessment</p> <p>AO1 / AO4 - End of unit assessment – Test based knowledge</p>	<p>AO1 / AO3 / AO4 – End of year Mock – Based on Y10 learning and AQA Specification</p>

Y11	Week 1  Week 39	
	<i>NEA – 50% of course waiting</i>	<i>Exam Theory 50%</i>
Key content (know that...Know how...)	<i>Due to 2 hour per week at option subjects. They students will focus on completing 1 lesson per week of NEA work and 1 lesson per week of exam theory to ensure that the different content is delivered.</i>	
	<p>NEA – Independent Project</p> <p>Students have started NEA at the end of Y10 when the initial brief was released. They are to work on and produce the following using a PowerPoint document also with physical models and drawings / sketches. Substantial design and make task</p> <p>Assessment criteria:</p> <ul style="list-style-type: none"> • Identifying and investigating design possibilities • Producing a design brief and specification • Generating design ideas • Developing design ideas • Realising design ideas • Analysing & evaluating • Photographic evidence of the final manufactured prototype. 	<p>Exam Theory</p> <p><i>Students will be taught a range of theory content. Some theory content will be recall and some will be new. Students will have a range of exam questions to complete based on the theory they have learned.</i></p> <ul style="list-style-type: none"> • Understanding the exam • Exam language • Layout of questions and the paper <p>Core and technical principles linked to the exam knowledge the students will need. Each of the elements below can be expanded further to more detail of what can be included.</p> <ul style="list-style-type: none"> • New and emerging technologies • Energy generation and storage • Developments in new materials • Systems approach to designing • Mechanical devices • Materials and their working properties.

Prior Knowledge	<p><u>NEA – Independent Project</u></p> <ul style="list-style-type: none"> • Students will recap on prior knowledge learned throughout Y10 and Y11 to help them develop their NEA project. • Recap KS3 knowledge of tools not used in Y10 / Y11 but used previously at KS3 in Design and Technology. • Students will have to undertake independent research to help them develop their ideas and designs for their chosen solution. • General understanding of the project / product they are going to make • Materials knowledge and what different products can be made from • Joining techniques – done through research of existing products and taking products apart (Primary Research) • Finishing and assembly techniques of materials learned through different practical projects 	<p><u>Exam Content</u></p> <p>Prior knowledge will be relevant throughout all areas of exam revision for topics that have been previously covered in Y10 or KS3. All topics will have areas for recall and links to past projects and skills.</p> <p>Prior knowledge will be checked at the start of each unit area to ensure the students can relate to the subject / topic area and have a base for starting to develop further.</p>
Assessment Objectives	<ul style="list-style-type: none"> • AO1: Identify, investigate and outline design possibilities to address needs and wants. • AO2: Design and make prototypes that are fit for purpose. • AO3: Analyse and evaluate: <ul style="list-style-type: none"> ○ Design decisions and outcomes, including for prototypes made by themselves and others ○ Wider issues in design and technology. • AO4: Demonstrate and apply knowledge and understanding of: <ul style="list-style-type: none"> ○ Technical principles ○ Designing and making principles. 	
	<p>Practical application of:</p> <ul style="list-style-type: none"> • Core technical principles • Specialist technical principles • Designing and making principles <p>Non-exam assessment (NEA):</p> <ul style="list-style-type: none"> • 30–35 hours approx. • 100 marks • 50% of GCSE 	<ul style="list-style-type: none"> • Core technical principles • Specialist technical principles • Designing and making principles <p>In addition:</p> <ul style="list-style-type: none"> • At least 15% of the exam will assess maths • At least 10% of the exam will assess science. <p>Written exam:</p> <ul style="list-style-type: none"> • 2 hours • 100 marks • 50% of GCSE

		<p>Section A – Core technical principles (20 marks) A mixture of multiple choice and short answer questions assessing a breadth of technical knowledge and understanding.</p> <p>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.</p> <p>Section C – Designing and making principles (50 marks) A mixture of short answer and extended response questions</p>
Assessments	<p>NEA cannot be feedback upon live while the students are working on it. Generic feedback can be given to help support the students.</p> <p>NEA is internally moderated and then sent to the exam board by the deadline – May of Y11 study year</p>	<p>November Mock series</p> <p>Feb Mock series</p> <p>Summative assessments used throughout the year – trackers / class tests and quizzes used to help track progress</p> <p>Final Exam July – Y11</p>