

GCSE Design & Technology- Resistant Materials; Timber Based Materials

“If you do it right, it will last forever.” –Massimo Vignelli

Year 10

The Rationale - GCSE Design and Technology will prepare students to participate confidently and successfully in an increasingly technological world. Students will gain awareness and learn from wider influences on Design and Technology including historical, social, cultural, environmental and economic factors. Students will get the opportunity to work creatively when designing and making and apply technical and practical expertise. Our GCSE allows students to study core technical and designing and making principles, including a broad range of design processes, materials techniques and equipment. They will also have the opportunity to study specialist technical principles in greater depth.

	Autumn Term 1	Autumn Term 2	Spring Half Term 3	Spring Half Term 4	Summer Term 5	Summer Term 6
Curriculum Knowledge	<p>Core Technical Principles:</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. 	<p>Material Categories: Natural and Manufactured Timbers.</p> <p>Students should have an overview of the main categories and types of natural and manufactured timbers:</p> <p>Hardwoods including:</p> <ul style="list-style-type: none"> • ash • beech • mahogany • oak • balsa <p>Softwoods including:</p> <ul style="list-style-type: none"> • larch • pine • spruce <p>Manufactured Boards including:</p> <ul style="list-style-type: none"> • medium density fibreboard (MDF) 	<p>The Work of Others.</p> <p>Students investigate, analyse and evaluate the work of past and present designers and companies to inform their own designing.</p> <p>Designers:</p> <ul style="list-style-type: none"> • Alexander McQueen • Aldo Rossi • Charles Rennie Macintosh • Coco Chanel • Ettore Sottsass • Gerrit Reitveld • Harry Beck • Louis Comfort Tiffany • Marcel Breuer • Mary Quant • Norman Foster • Philippe Starck • Raymond Templier • Sir Alec Issigonis 	<p>Specialist Technical Principles.</p> <p>Timber based materials;</p> <p>Sources & Origins;</p> <p>seasoning, conversion & creation of manufactured timbers.</p> <p>Properties of Materials;</p> <p>traditional timber children’s toys and flat pack furniture.</p> <p>Seasoning to reduce moisture content of timbers.</p> <p>How to cut, drill, chisel, sand and plane.</p> <p>Stock forms, types & Sizes;</p> <ul style="list-style-type: none"> • planks, boards and standard mouldings • sold by length, width, thickness and diameter 	<p>Designing & Making Principles.</p> <p>Students begin real NEA.</p> <p>Use primary and secondary data to understand client and/or user needs.</p> <ul style="list-style-type: none"> • market research, interviews and human factors including ergonomics • focus groups, product analysis and evaluation • the use of anthropometric data. <p>How to write a design brief and produce a design & manufacturing specification.</p>	<p>Designing & Making Principles.</p> <p>Students continue their real NEA.</p> <p>Generate imaginative & creative design ideas using a range of different design strategies; collaboration, user centered design, a systems approach, iterative design, avoiding design fixation.</p> <p>Explore & develop their own ideas; sketching, modelling, testing, evaluation of their work to improve outcomes.</p>

		<ul style="list-style-type: none"> • plywood • chipboard. 	<ul style="list-style-type: none"> • Vivienne Westwood • William Morris. Companies: <ul style="list-style-type: none"> • Alessi • Apple • Braun • Dyson • Gap • Primark • Under Armour • Zara. 	<ul style="list-style-type: none"> • standard components e.g. woodscrews, hinges, KD fittings. 		
Subject Skills	<p>The AQA GCSE Design and Technology specification sets out the knowledge, understanding and skills required to undertake the iterative design process of exploring, creating and evaluating. The subject content, topics and themes has been split into three sections as follows:</p> <ul style="list-style-type: none"> • Core Technical Principles - all content is delivered to all students. • Specialist Technical Principles – students will go into greater depth, in their chosen material area; for example, papers and boards, timber based materials, metal based materials, polymers, and electronic and mechanical systems. • Designing and Making Principles - all content is delivered to all students. <p>Core Technical Principles; new and emerging technologies, energy generation and storage, developments in new materials, systems approach to designing, mechanical devices, materials and their working properties.</p> <p>Specialist Technical Principles; selection of materials or components, forces and stresses, ecological and social footprint, sources and origins, using and working with materials, stock forms, types and sizes, scales of production, specialist techniques and processes, surface treatments and finishes.</p> <p>Designing and making principles; investigation, primary and secondary data, environmental, social and economic challenge, the work of others, design strategies, communication of design ideas, prototype development, selection of materials and components, tolerances, material management, specialist tools and equipment, specialist techniques and processes.</p>					
How can you help your child engage with the content?	Encourage your child to keep a sketch book and draw daily, practice the different drawing techniques shown during lessons.	Encourage your child to identify different types of timbers and manufactured boards in the home.	Encourage your child to use the Google Classroom at home to complete the research tasks on their chosen Designers & Companies.	Encourage your child to use the CGP D&T Textbook, which is purchased at the beginning of Year 10 to help with homework and specialist theory work.	Encourage your child to explore the three Contextual Challenges set by the AQA exam board, decide which one will hold their interest for the duration of the NEA.	Encourage your child to work on their theory homework at home, whilst the NEA is completed in school.
Curriculum Opportunities				Rotary BAE Systems Technology Tournament.	Year 10 Helpers at Year 9 Options Evening.	Year 10 Helpers at Year 5 D&T Taster Sessions.
Career Links	This GCSE is very good preparation for A Levels, College and for employment at the age of 16, and provides a good grounding for pupils thinking about apprenticeships, employment in the building trade or careers in areas such as Product Design, Electrical Engineering, Mechanical Engineering, Civil Engineering, Architecture, Teaching, Marine Engineering, Structural Engineering, Interior Design, Materials Science, and Automotive Engineering.					

Year 11

The Rationale – Students will continue working on their **Non-Exam Assessment (NEA)**; a substantial design and make task, with six separate assessment criteria; Identifying and investigating design possibilities, Producing a design brief and specification, Generating design ideas, Developing design ideas, Realising design ideas, and Analysing & evaluating. Students will spend 30–35 hours approx. during lessons on their Non-Exam Assessment (NEA), which is **equal to 50% of GCSE** and 100 marks. Contextual challenges are released annually by AQA on 1 June in the year prior to the submission of the NEA, students will produce a prototype and an A3 portfolio of evidence; work will be marked by teachers and moderated by AQA.

Once the Non-Exam Assessment (NEA) is completed, students will continue their preparation for the **Written Exam**; 2 hours, 100 marks, **equal to 50% of GCSE**. What's assessed; Core Technical Principles, Specialist Technical Principles, Designing and Making Principles. In addition: at least 15% of the exam will assess maths, and at least 10% of the exam will assess science.

Section A – Core Technical Principles (20 marks)

- A mixture of multiple choice and short answer questions assessing a breadth of 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.

Section C – Designing and making principles (50 marks)

- A mixture of short answer and extended response questions.

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Curriculum content	<p>Students continue their real NEA. Selection of Materials and Components. Select & use materials and components appropriate to the task considering, functional need, cost, availability. Tolerances; work accurately using tolerances. Material Management; the importance of planning the cutting & shaping of material to minimise waste.</p>	<p>Students continue their real NEA. Prototype Development. Design & develop prototypes in response to client wants & needs. Understand how to evaluate prototypes & be able to reflect critically, responding to feedback when evaluating their own prototypes, suggest modifications to improve them through inception & manufacture, assess if</p>	<p>Focus on written examination;</p> <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)</p>	<p>Focus on written examination;</p> <p>Section C – Designing and making principles (50 marks) - A mixture of short answer and extended response questions.</p>	<p>Further preparation, past exam papers and revision for Written Examination, Paper 1, 2 hours, 100 marks.</p>	<p>Written Examination, Paper 1, 2 hours, 100 marks.</p>

	Specialist Tools and Equipment; select and use specialist equipment. Specialist Techniques and Processes. Surface Treatments and Finishes.	prototypes are fit for purpose.	and one extended response to assess a more in depth knowledge of technical principles.			
Key Skills	<p>The AQA GCSE Design and Technology specification sets out the knowledge, understanding and skills required to undertake the iterative design process of exploring, creating and evaluating. The subject content, topics and themes has been split into three sections as follows:</p> <ul style="list-style-type: none"> • Core Technical Principles - all content is delivered to all students. • Specialist Technical Principles – students will go into greater depth, in their chosen material area; for example, papers and boards, timber based materials, metal based materials, polymers, electronic and mechanical systems. • Designing and Making Principles - all content is delivered to all students. <p>Core Technical Principles; new and emerging technologies, energy generation and storage, developments in new materials, systems approach to designing, mechanical devices, materials and their working properties.</p> <p>Specialist Technical Principles; selection of materials or components, forces and stresses, ecological and social footprint, sources and origins, using and working with materials, stock forms, types and sizes, scales of production, specialist techniques and processes, surface treatments and finishes.</p> <p>Designing and making principles; investigation, primary and secondary data, environmental, social and economic challenge, the work of others, design strategies, communication of design ideas, prototype development, selection of materials and components, tolerances, material management, specialist tools and equipment, specialist techniques and processes.</p>					
How can you engage with your child?	Encourage your child to attend afterschool sessions to work on their practical element of their NEA.	Encourage your child to attend afterschool sessions to evaluate their NEA prototype designs in detail.	Encourage your child to being making revision notes, flash cards, mind maps, etc. in preparation for the Summer exam.	Quiz your child on the Core, Specialist & Designing & Making Principles in preparation for the Summer exam.	Quiz your child on the Core, Specialist & Designing & Making Principles in preparation for the Summer exam.	
Curriculum Opportunities		Showcase work at Year 9 Options Evening.				
Career Links	This GCSE is very good preparation for A Levels, College and for employment at the age of 16, and provides a good grounding for pupils thinking about apprenticeships, employment in the building trade or careers in areas such as Product Design, Electrical Engineering, Mechanical Engineering, Civil Engineering, Architecture, Teaching, Marine Engineering, Structural Engineering, Interior Design, Materials Science, and Automotive Engineering.					