

Curriculum Map Year 10: Design and Technology GCSE

Practical projects may be subject to change

	Topic	Key Knowledge <i>What will students know by the end of this topic?</i>	Key Skills <i>What skills will students have developed by the end of this topic?</i>	Assessment Opportunities <i>How will student progress be measured? What are the key assessment pieces?</i>
Half Term 1	Tealight Holder Project Toiletries Bag Project and Textiles skill-building part 1 Theory- Core Technical Principles	- Students will have a greater understanding of CAD software, specifically 2D Design V2. - Will learn about temporary and permanent joining techniques. - Will learn about different adhesives and their application. - Students will learn about the material properties. - Will learn about different types of timber, manufactured wood, their life cycles, their application and stock forms. - Will learn about different types of polymers, their life cycle, their application and common stock forms. - Will learn about sustainability issues, renewable/non-renewable energy and climate change. - Will learn how to research effectively and apply this to design work.	Students will be able to: - Demonstrate a range of design and making skills, including: learning to cut and engrave sheet material using 2D Design V2, setting up the laser cutter, selecting and using an appropriate adhesive, marking and measuring out materials using appropriate tools, sawing, drilling, using a forstener bit, sanding using abrasive paper and the sanding disk and waxing. - Construct a neat seam, construction from a pattern, using wadding, quilting, sewing machine control and accuracy, installing a zip, installing lining, fabric manipulation and structuring. - Answer past paper questions on timber, polymers, manufactured boards and sustainability. - Complete a life cycle analysis of timber and polymers.	Seneca Learning- Core Technical Principles (Section A)
Half Term 2	Toiletries Bag Project and Textiles skill-building part 2 Metal Animal Project Theory- Core Technical Principles	- Students will learn about the three main groups of metals, their application, their lifecycle and stock forms. - Students will learn about industrial processes associated with timbers, metals and plastics. - Students will learn about basic input and output systems and electrical components. - Students will learn the importance of lay planning on sheet material to minimise wastage. - Students will learn about bonded, knitted and woven fabrics and their common applications. - Students will learn about different construction methods associated with textile products.	Students will be able to: - Construct a neat seam, construction from a pattern, using wadding, quilting, sewing machine control and accuracy, installing a zip, installing lining, fabric manipulation and structuring. - Demonstrate a range of design and making skills, including: construction using a net design, calculating and avoiding waste in a design, tessellation and nesting, practical metal-working skills including cutting using a hacksaw, filing effectively and deforming to desired shape.	Seneca Learning- Core Technical Principles (Section A)

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Half Term 3	Metal Animal Project Wooden stool project Theory- Core and specialist technical Principles	- Students will learn about smart materials. - Students will learn about tolerances and how to mark materials accurately. - Students will learn about key designers and brands. - Students will revisit different design movements. - Students will learn about different types of modelling and prototyping and their advantages. - Students will learn about different types of paper, card and board and their applications. - Students will learn about scales of production.	Students will be able to: - Demonstrate a range of design and making skills, including: construction using a net design, calculating and avoiding waste in a design, tessellation and nesting, practical metal-working skills including cutting using a hacksaw, filing effectively and deforming to desired shape. - Demonstrate a range of design and making skills including: marking out timber using a variety of jigs and templates, hand sawing filing and sanding, working within tight tolerances, gluing and finishing, accurate assembly.	Mini 1 hour mock in class time
Half Term 4	Remaining Theory Topics Wooden stool project Theory: Designing and Making Principles	- Students will enhance their 3D and technical drawing skills- isometric, orthographic projection. - Students will explore key maths skills on the exam. - Students will learn about different forces, types of movement, levers, gears and other mechanical devices. - Revision about theory learnt so far for March Mock Exam.	Students will be able to: - Self-assess their practical outcomes to a GCSE standard. - Draw in isometric and orthographic projection and complete exam-style questions where they apply this knowledge. - Demonstrate a range of design and making skills including: marking out timber using a variety of jigs and templates, hand sawing filing and sanding, working within tight tolerances, gluing and finishing, accurate assembly.	Seneca Learning- Timbers (Section B) Seneca Learning- Polymers (Section B)
Half Term 5	Theory: Designing and Making Principles Wooden stool project	- Students will learn about different design strategies. - Students will learn about inclusive design. - Students will learn about anthropometrics and ergonomics. - Students will learn how to complete a product analysis. - Students will learn about market pull and technology push.	Students will be able to: - Confidently complete a range of past paper questions about different material areas and processes. - Complete some primary research on anthropometrics and ergonomics. - Use ACCESS FM to complete a product analysis. - Demonstrate a range of design and making skills including: marking out timber using a variety of jigs and templates, hand sawing filing and sanding, working within tight tolerances, gluing and finishing, accurate assembly.	April mock exams

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		- Students will explore material selection, tool and equipment selection and how to select appropriate finishes. - Students will learn about material testing, production aids and quality control. - Students will revisit material physical properties. Students should know and understand that all design and technology activities take place within a wide range of contexts. - 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.		
Half Term 6	NEA Introduction	Introduction of the NEA Exploration of NEA Initial Design Brief and Research Design Brief and Specification Summer Task- Section C sketches Complete the first five pages of their GSCE coursework before the end of term. Seven pages expected on arrival in September	Students will be able to: - Carry out meaningful primary and secondary research, investigate the work of others and research the wider moral and societal issues related to their chosen NEA topic. - Identify design possibilities, investigate client needs and wants and factors including economic and social challenges. Students should also use the work of others (past and/or present) to help them form ideas. Research should be concise and relate to their contextual challenge. Students are also advised to use a range of research techniques (primary/secondary) in order to draw accurate conclusions. Students should be encouraged to	Teacher Feedback on NEA pages

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			investigate throughout their project to help inform decisions. Outline design possibilities by producing a design brief and design specification. Students should review both throughout the project.	

Curriculum Map Year 11: **Design and Technology GCSE**

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Half Term 1	NEA Theory remaining topics from specialist technical principles and designing and making	Section C refinement- initial Sketches and modelling. Section D begins- design development Students will revisit timbers and polymers in-depth to prepare for section B of their exam- specialist technical principles, with a focus on: - selection of materials or components - forces and stresses - ecological and social footprint - sources and origins - using and working with materials	Students will be able to: Explore a range of possible ideas linking to the contextual challenge selected. These design ideas should demonstrate flair and originality and students are encouraged to take risks with their designs. Students may wish to use a variety of techniques to communicate. Students will not be awarded for the quantity of design ideas but how well their ideas address the contextual challenge selected. Students are encouraged to be imaginative in their approach by experimenting	Teacher Feedback on NEA pages

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	principles/ revision	• stock forms, types and sizes • scales of production • specialist techniques and processes • surface treatments and finishes. Students should know and understand that all design and technology activities take place within a wide range of contexts. • 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.	with different ideas and possibilities that avoid design fixation. • Develop and refine design ideas. This may include, formal and informal 2D/3D drawing including CAD, systems and schematic diagrams, models and schedules. Students will develop at least one model, however marks will be awarded for the suitability of the model(s) and not the quantity produced. • Students will also select suitable materials and components communicating their decisions throughout the development process. Students are encouraged to reflect on their developed ideas by looking at their requirements; including how their designs meet the design specification. Part of this work will then feed into the development of a manufacturing specification providing sufficient accurate information for third party manufacture, using a range of appropriate methods, such as measured drawings, control programs, circuit diagrams, patterns, cutting or parts lists.	
Half Term 2	NEA Revision	Section D- Design Development Section E- Final Prototype	Students will be able to: • Develop and refine design ideas. This may include, formal and informal 2D/3D drawing including CAD, systems and schematic diagrams, models and schedules. Students will develop at least one model, however marks will be awarded for the suitability of the model(s) and not the quantity produced. • Students will also select suitable materials and components communicating their decisions throughout the development process. Students are encouraged to reflect on their developed ideas by looking at their requirements; including how their designs meet the design specification. Part of this work will then feed into the development of a	November Mock Teacher Feedback on NEA pages

	Topic	Key Knowledge <i>What will students know by the end of this topic?</i>	Key Skills <i>What skills will students have developed by the end of this topic?</i>	Assessment Opportunities <i>How will student progress be measured? What are the key assessment pieces?</i>
			manufacturing specification providing sufficient accurate information for third party manufacture, using a range of appropriate methods, such as measured drawings, control programs, circuit diagrams, patterns, cutting or parts lists. Work with a range of appropriate materials/components to produce prototypes that are accurate and within close tolerances. This will involve using specialist tools and equipment, which may include hand tools, machines or CAM/CNC. The prototypes will be constructed through a range of techniques, which may involve shaping, fabrication, construction and assembly. The prototypes will have suitable finish with functional and aesthetic qualities, where appropriate. Students will be awarded marks for the quality of their prototype(s) and how it addresses the design brief and design specification based on a contextual challenge.	
Half Term 3	NEA Theory remaining topics from specialist technical principles and designing and making principles	Section E- Final Prototype Students will revisit timbers and polymers in-depth to prepare for section B of their exam- specialist technical principles, with a focus on: - 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.	Students will be able to: Work with a range of appropriate materials/components to produce prototypes that are accurate and within close tolerances. This will involve using specialist tools and equipment, which may include hand tools, machines or CAM/CNC. The prototypes will be constructed through a range of techniques, which may involve shaping, fabrication, construction and assembly. The prototypes will have suitable finish with functional and aesthetic qualities, where appropriate. Students will be awarded marks for the quality of their prototype(s) and how it addresses the design brief and design specification based on a contextual challenge.	Teacher Feedback on NEA pages

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		Students should know and understand that all design and technology activities take place within a wide range of contexts. • 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.		
Half Term 4	NEA	Section E- Final Prototype Section F- Evaluation	Students will be able to: • Work with a range of appropriate materials/components to produce prototypes that are accurate and within close tolerances. This will involve using specialist tools and equipment, which may include hand tools, machines or CAM/CNC. The prototypes will be constructed through a range of techniques, which may involve shaping, fabrication, construction and assembly. The prototypes will have suitable finish with functional and aesthetic qualities, where appropriate. Students will be awarded marks for the quality of their prototype(s) and how it addresses the design brief and design specification based on a contextual challenge. • Continuously analyse and evaluate their work, using their decisions to improve outcomes. This should include defining requirements, analysing the design brief and specifications along with the testing and evaluating of ideas produced during the generation and development stages. Their final prototype(s)	Teacher Feedback on NEA pages Hand in date normally around March 20th.

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			will also undergo a range of tests on which the final evaluation will be formulated. This should include market testing and a detailed analysis of the prototype	
Half Term 5	Revision	Revision of key topics in preparation for DT GCSE exam.	Students will be able to competently and confidently answer a range of past paper questions without prompts.	NEA marked by teacher and sample-checked by AQA.
Half Term 6		N/a		