

## Year 12 and 13 Design Technology Curriculum

Unit	Core knowledge/skill development	Sequence	Assessment	Literacy, numeracy, PSHE, FBV, other links	ACP and VAA development	Home learning and enrichment
Mini NEA – Investigating needs	Proving the need for a product through exploration of multiple possibilities	Builds on the students' experience of investigating client and performance needs from GCSE	Assessed against specification criteria and moderated internally	Correct use of subject specific terminology	<b>Empathetic</b> – being able to appreciate the views of others	Progress expected from week to week to ensure project is completed to deadlines (ongoing homework, alongside theory tasks/questions)
Mini NEA - Research	Exploring the needs/wants of a relevant client or user, selecting pertinent areas to research and producing a detailed specification	Builds on the students' experience of selecting and carrying out relevant research from GCSE	Assessed against specification criteria and moderated internally	<b>FBV</b> – appreciating the differences between different types of users (inclusive design)	<b>Empathetic</b> – being able to appreciate the views of others <b>Analysing</b> multiple sources of information and drawing conclusions to support design decisions	Progress expected from week to week to ensure project is completed to deadlines (ongoing homework, alongside theory tasks/questions)
Mini NEA – Generating design ideas	Produce a range of ideas which address the specification, the needs of the user and evidence the ability to suggest alternative materials and manufacturing methods	Builds on the students' experience of producing design ideas needs from GCSE	Assessed against specification criteria and moderated internally Assessed against specification criteria and moderated internally	Correct use of subject specific terminology, with particular emphasis on materials and methods	<b>Creating</b> – using fluent and flexible thinking to generate ideas Coming up with original ideas <b>Linking</b> annotation to materials and manufacturing knowledge <b>Linking</b> ideas to research, specification, and user requirements	Progress expected from week to week to ensure project is completed to deadlines (ongoing homework, alongside theory tasks/questions)

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Mini NEA – Developing ideas	Produce refined ideas and models (including CAD) which show how 3 <sup>rd</sup> party opinion has affected design decisions.	Builds on the students' experience of idea development from GCSE, particularly physical and CAD modelling	Assessed against specification criteria and moderated internally	Correct use of subject specific terminology, with particular emphasis on materials and methods.	<b>Creating</b> – using fluent and flexible thinking to generate ideas <b>Linking</b> annotation to materials and manufacturing knowledge <b>Linking</b> ideas to research, specification, and user requirements	Progress expected from week to week to ensure project is completed to deadlines (ongoing homework, alongside theory tasks/questions)
Mini NEA – Realising ideas	Produce an accurate scale prototype	Builds on the students' experience of workshop techniques and methods from GCSE and KS3	Assessed against specification criteria and moderated internally	<b>Numeracy</b> – correctly and accurately using measuring and marking out techniques	<b>Realising</b> – Accuracy – Follow a manufacturing specification to accurately produce a scale prototype Automaticity – find ways to be able to easily repeat techniques	Progress expected from week to week to ensure project is completed to deadlines (ongoing homework, alongside theory tasks/questions)
Mini NEA – Testing ideas	Prove the viability of the solution by testing against specification, performance criteria and 3 <sup>rd</sup> party testing	Builds on the students' experience of testing and evaluating from GCSE	Assessed against specification criteria and moderated internally		<b>Empathetic</b> – being able to appreciate the views of others <b>Analysing</b> multiple sources of information and drawing conclusions to support design decisions and suggest improvements	Progress expected from week to week to ensure project is completed to deadlines (ongoing homework, alongside theory tasks/questions)

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Theory – Performance characteristics of materials	Be able to define, apply and explain the difference between hardness, toughness, all types of strength, durability, electrical and thermal conductivity	Limited experience in KS4, whereas in Year 12 students will learn a wider range of working properties and characteristics of materials	Exam questions homework assessed as per exam specification guidance Low stakes google quizzes	Subject specific terminology	<b>Linking</b> – generalisation – identifying how these concepts can be learnt better by applying them to products and situations the students already understand.	Exam questions
Theory – 1.1 Materials: Plastics, woods, metals, composites, smart and modern materials	Thermosetting and thermoforming polymers; wood and wood-based materials; ferrous, non-ferrous, alloys; concrete, plywood, carbon fibre, GRP, and robotic materials	Builds on students' prior knowledge from KS4 Will lead to students being able to include more detailed annotation of design ideas and design development in mini-NEA	Exam questions homework assessed as per exam specification guidance Low stakes google quizzes	<b>SMSC</b> – the use of fossil fuels to produce plastics, mining, recycling and its limitations, GM trees	<b>Linking</b> to processes and techniques (how students will apply this knowledge)	Exam questions
3.4 – Joining techniques 3.5 – finishing techniques	Wood joints, knock-down fittings, mechanical fixings, adhesives and welding. Waxing, varnishing, painting, anodising and electroplating	Builds on students' prior knowledge from KS4	Exam questions homework assessed as per exam specification guidance Low stakes google quizzes		<b>Linking</b> to the mini-NEA task (lamination, waxing etc) Analysing -	Exam questions

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5.1 – user-centred design 5.2 – ergonomics and anthropometrics 5.3 – form over function	a) user needs, wants and values b) purpose c) functionality d) innovation e) authenticity.	Builds on students' prior knowledge from KS4 Will help to inform student's design decisions during NEA and mini NEA	Exam questions homework assessed as per exam specification guidance Low stakes google quizzes	<b>FBV</b> – appreciating the differences between different types of users (inclusive design)	<b>Empathetic</b> – being able to appreciate the views and needs of others, and see how that can be used to improve the work of designers	Exam questions
3.1 Processes and techniques	a) heat treatments b) alloying c) printing d) casting e) machining f) moulding g) lamination h) marking out	Builds on students' prior knowledge from KS4	Exam questions homework assessed as per exam specification guidance Low stakes google quizzes	<b>SMSC</b> – environmental pressure caused by quantity production	<b>Linking</b> to materials knowledge to help to exemplify new concepts	Exam questions Product analyses
5.4 – Past and present designers:	a) Arts and Crafts – William Morris b) Art Nouveau – Charles Rennie Mackintosh c) Bauhaus Modernist – Marianne Brandt d) Art Deco – Eileen Gray e) Post Modernism – Philippe Starck	New topic for most students	Exam questions homework assessed as per exam specification guidance Low stakes google quizzes	<b>Literacy</b> – extended, essay-style questions	<b>Link</b> certain aspects to what students know about materials and manufacturing techniques, E.g. How Bauhaus furniture design principles were directly influenced by the introduction of mass production techniques	Exam questions

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	f) Streamlining – Raymond Lowey g) Memphis – Ettore Sottsass.					
4.1 – Digital technologies, CAM and rapid prototyping	Advantages, disadvantages and how to safely set up: a) computer-aided design (CAD) – 2D and 3D design to create and modify designs and create simulations, 3D modelling for creating ‘virtual’ products b) computer-aided manufacture (CAM) and rapid prototyping – CNC lathes, CNC routers, CNC milling machine, CNC laser, CNC vinyl cutters, rapid prototyping.	Builds on students’ prior knowledge from KS4  Will help students in design development section of mini-NEA and assessed NEA.	Exam questions homework assessed as per exam specification guidance Low stakes google quizzes		<b>Linking</b> to development section of NEA – using CAD/CAM as an efficient and cost-effective method of producing prototypes and testing ideas	Exam questions

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6.1 – effects of technological developments	a) – Mass production b) – Industrial age c) – Global marketplace	Builds on students' prior knowledge from KS4	Exam questions homework assessed as per exam specification guidance Low stakes google quizzes	SMSC – ethical considerations of mass production	Link to certain design movements (post-modernism, Bauhaus, A&CM) Link to products that students are already aware of (phones, computers etc.)	Exam questions
11.1 Information handling, modelling and forward planning	a) – marketing b) – innovation management c) – feasibility studies	New topic for most students	Exam questions homework assessed as per exam specification guidance Low stakes google quizzes		Link to companies such as Nike and Apple so students can contextualise the learning to products they understand	Exam questions
Year 13						
8.1 – characteristics and stages of methods of production 8.2 – characteristics, application, advantages and disadvantages of quality monitoring systems 8.3 – characteristics, processes, application, advantages and disadvantages of		Builds on students' prior knowledge from KS4				

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modern manufacturing methods and systems						
11.2 – modelling the costing of projects 21.1 – strategies, techniques and approaches to explore, create and evaluate design ideas		Builds on students' prior knowledge from KS4				
9 – designing for maintenance and the cleaner environment 12.3 – product life cycle		New topic for most students Builds on students' prior knowledge from KS4				
NEA						