Croxley Danes School : Design & Technology Key Stage 4 Curriculum Map

Subject: Design & Technology Product Design **Exam Board KS4 AQA**

Key Stage 4 Year Group: 10 GCSE AQA DT Product Design

In the first year of GCSE Product Design students will develop a working knowledge and understanding of a range of materials and their working properties- This will allow students to expand their making skills and vocabulary for them to answer the terminal exam paper and the NEA task. Through specific theory lessons and Homework tasks students will practise exam technique in answering a range of questions on the materials topics to prepare them fully for the terminal examination. Students will be assessed at the end of theory topics.

Areas of Content:

Technical principles • Designing and making principles • Analysing and evaluating designs • Social and ethical issues in design technology
Identifying and investigating design possibilities • Designing and making prototypes

	Autumn Term	
Key Concept	**Design & Making Skills**	**Knowledge**
Content: **(Know what…)**	**<u>Skills Timber Project</u>** Students will design and create a wooden box with a lid, focusing on developing a wide range of woodworking skills. This project will develop their practical skills and knowledge in working with timber and polymers, enhancing their understanding of material properties, and improving their practical skills. Students will explore various techniques in measuring, cutting, joining, finishing, and detailing timber to produce a high-quality product.	**<u>Section A – Core Principles</u>** The core principles of the AQA Design Technology GCSE form the foundation upon which students build their understanding of design and technology. These principles encompass a wide range of topics that are crucial for students to grasp in order to develop their skills and knowledge in designing and creating products

Skills:
(Know how…)
	• Design and communication skills
	• Understanding material selection
	• Measuring and marking out
	• Wasting and shaping materials
	• Joining techniques
	• Surface preparation and finishing
	• Attaching hinges and hardware
		<u>Section A – Core Principles</u>
		• New and emerging technologies
		• Energy generation and storage
		• Developments in new materials
		• Systems approach to designing
		• Mechanical devices
		• Materials working properties
		  ○ Papers & Board
		  ○ Timber
		  ○ Metal
		  ○ Polymers
		  ○ Textiles

Key vocabulary (5- 10 words)	Design Brief ● Analysis ● Specification ● Housing joint ● Comb Joint ● Dowel Joint ● Mitre Joint ● Rebate Joint	Vacuum Forming ● Hinges ● Hardwoods ● Softwoods ● Seasoning ● Conversion ● Laser cutting ● CAD/CAM	Innovation ● Automation ● Renewable energy ● Non-renewable energy ● Smart Materials ● Linear motion ● Rotary motion ● Elasticity	● Levers ● Cams ● Gears ● Metals ● Polymers ● Textiles ● Thermal conductivity ● Reciprocating motion
End of term assessment	Skill Box Skills and Knowledge Assessment End of unit assessment of the skill box. Assessing the quality of the final outcome		Section A topic tests.	
Planned trips / Clubs / links	https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification/subject-content/core-technical-principles			

Key Stage 4	**Year Group: 10 GCSE AQA DT Product Design**	
	Spring Term	
Key Concept	**Design & Making Skills**	**Knowledge**
Content: **(Know what…)**	**<u>Practise NEA Project - Context - Childrens Toy</u>** The project involves designing and manufacturing a children's toy from a given context using a combination of timber and plastic materials. The aim is to create a durable, safe, and engaging toy that supports children's development through play. This toy should appeal to children aged 3-7, promoting motor skills, creativity, and cognitive development. The design process will consider safety standards, material sustainability, and manufacturing techniques and introduce the students to aspects of the NEA.	**<u>Section B – Specialist Technical Principles</u>** Specialist technical principles, provides the students with a deeper understanding of the specific techniques, processes, and skills required in various design and technology disciplines. This knowledge builds upon the foundational knowledge from Section A and focuses on more detailed aspects of materials, their properties, and their applications in design projects.

Skills: (Know how…)	**Practise NEA Project - Context - Childrens Toy** **CAD Software** : Learn to use computer - aided design (CAD) software to create detailed 3D models of the toy components. **Prototyping** : Develop skills in rapid prototyping techniques using cardboard and traditional woodworking tools for timber parts. **Material Selection** : Understand the properties of different types of timber and plastics, and how to select the best materials for strength, safety, and aesthetics. **Making Skills** : Gain experience in cutting, shaping, and finishing timber using hand tools and power tools. **Assembly Techniques** : Understand different methods for assembling timber and plastic components securely.		**Section B – Specialist Technical Principles Specialist** ● Timber ● Polymers ● Selection of Materials and 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	
Key vocabulary (5- 10 words)	Laser cutting ● CAD ● TinkerCAD ● Wax ● Paint ● Design ●	● Evaluation ● Testing ● Chisel ● Acrylic ● Hardwoods ● Softwoods ● Manufactured Boards	● Material Properties ● Component Selection ● Forces ● Stresses ● Sustainability ● Life Cycle Analysis ● Raw Material Extraction ● Renewable Resources ● Non - renewable Resources	● Shaping Techniques ● Forming Techniques ● Stock Forms ● Scales of Production ● One - off Production ● Batch Production ● Mass Production ● Joining Methods ● Finishing Techniques ● Surface Treatments ● Ecological Footprint
End of term assessment	Practice NEA Assessment (Investigation design solutions, brief & specification, design ideas, design development, making, evaluating & testing) End of unit assessment of the practice NEA. Assessing the quality of the final outcome		Section B topic tests	
Planned trips / Clubs / links	https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification/subject-content/specialist-technical-principles			

Key Stage 4	Year Group: 10 GCSE AQA DT Product Design			
	Summer Term			
Key Concept	**GCSE NEA COURSEWORK NEA 50% GCSE**		**Knowledge**	
Content: **(Know what…)**	**Design & Make a product** The NEA (Non - Exam Assessment) coursework component of the AQA Design Technology GCSE provides students with the opportunity to apply their theoretical knowledge and practical skills in a project - based context. This coursework is worth 50% of the students GCSE assessment, allowing students to demonstrate their ability to research, design, develop, and manufacture a product that meets a specific need or solves a particular problem. The NEA encourages creativity, critical thinking, and project management skill s		**Section C – Designing & Making Principles** Design & Making Principles focuses on the practical aspects of design and manufacturing, providing students with the skills and knowledge necessary to take a concept from initial idea to finished product. This section emphasises creativity, problem - solving, and the application of theoretical knowledge in real - world contexts. By mastering these principles, students will be equipped to create innovative and functional designs that meet specific needs and constraints.	
Skills: **(Know how…)**	Section A - Identifying & investigating design possibilities Section B - Producing a Design Brief and Specification Section C - Generating Design Ideas Section D - Developing Design Ideas Section E - Realising Design Ideas Section F - Analysing and Evaluating		● 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 ● Tools and Equipment	
Key vocabulary **(5- 10 words)**	● Design Brief ● Design Specification ● Primary Research ● Secondary Research ● Idea Generation ● Sketching ● Prototyping ● Computer - Aided Design ● Iterative Development	● Manufacturing ● Materials Selection ● Tools and Equipment ● Safety ● User Needs ● Market Analysis ● Evaluation ● Testing	● Investigation ● Primary Data ● Secondary Data ● Sustainability ● Social Responsibility ● Economic Viability ● Design Trends ● Design Movements ● User - Centred Design ● Iterative Design ● Brainstorming	● Sketching ● Prototyping ● Technical Drawing ● CAD (Computer - Aided Design) ● Visual Presentation ● Design Brief ● Design Specification ● Material Selection ● Tolerance
assessment	Ongoing assessment. Each section marked and whole class feedback given for improvements to be mad		Section C Topic Tests Year 10 Assessment - Mock Exam	
Planned trips / Clubs / links	Afterschool Catchup sessions https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification/subject-content/designing-and-making-principles			

Key Stage 4 **Year Group: 11 GCSE AQA DT Product Design** Students will complete their NEA coursework which amounts to 50% of their final grade before external moderation. Students will develop an understanding and gain confidence in exam techniques and practise exams skills required for the terminal paper based on their theory and practical knowledge from the last 2 years.		
	Autumn Term	
Key Concept	**GCSE NEA COURSEWORK NEA 50% GCSE**	**Knowledge**
Content: **(Know what…)**	**NEA Section A: Identifying and investigating design possibilities** ● understanding user needs and exploring the context. **NEA Section B: Producing a design brief and specification** ● setting out clear aims and success criteria. **NEA Section C: Generating design ideas** ● using creative strategies and sketching a range of possible solutions. **NEA Section D: Developing design ideas** ● refining ideas through modelling and feedback	● Completing the NEA (Non-Exam Assessment) project: ● research, ● design development, ● modelling, and ● starting the final prototype. ● Focus on user needs, environmental impact, and iterative design. ● How to justify and present design decisions effectively
Skills: **(Know how…)**	● Research and analysis of problems, users, and existing products. ● Writing a focused design brief and specification. ● Creative thinking and iterative design development. ● Using CAD, modelling techniques, and drawing skills to communicate design ideas.	● Researching and analysing existing products. ● Generating and developing creative design ideas. ● Communicating ideas clearly using sketches, CAD, and models. ● Planning and managing time effectively during a long-term project.
Key vocabulary (5- 10 words)	Contextual Challenge, Design Brief, Specification, User Needs, Primary/Secondary Research, Ergonomics, Sustainability, Iterative Design, Annotated Sketches, CAD/CAM, Accuracy, Joining Techniques, Finishing, Quality Control, User Feedback, Performance Testing, Justification, Innovation, Refinement, Functionality, Aesthetics	
End of Half term assessment	NEA Assessments Sections A - D	Year 11 Mock Exam
Planned trips / Clubs / links	https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification/scheme-of-assessment	

	Spring Term	
Key Concept	**Design & Making Skills**	**Knowledge**
Content: **(Know what…)**	**NEA Section E: Realising design ideas** ● selecting materials and making a final prototype with accuracy. **NEA Section F: Analysing and evaluating** ● testing the product and reflecting on how well it meets the brief and specification.	● Completing the NEA: final making and evaluation. ● Evaluating their prototype against the specification. ● Finalising and presenting design ideas and project work for submission.
Skills: **(Know how…)**	● Safe and accurate use of tools, machinery, and processes. ● Time planning and quality control. ● Critical reflection and evaluation against specification points. ● Documenting their process and decisions clearly.	● Accurate measuring, marking out, and using tools safely and independently. ● Quality control and testing products. ● Reflecting on work and making improvements. ● Writing a detailed and balanced evaluation.
Key vocabulary **(5- 10 words)**	Tolerance, accuracy, finish, evaluation, specification, quality assurance, testing, feedback, functionality, aesthetics. Accuracy, tolerance, finish, manufacturing, testing, evaluation, specification, client feedback, quality assurance.	
End of Half term assessment	NEA Assessments Sections E - F	Assessment topic tests
Planned trips / Clubs / links	https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification/scheme-of-assessment	

	Summer Term
Key Concept	**Exam Knowledge**
Content: **(Know what…)**	Revision and recap of key theory from the AQA specification in preparation for the written exam. ● Technical Principles ● Specialist Technical Principles ● Designing and Making principles Applying knowledge to practice exam questions and scenarios.
Skills: **(Know how…)**	● Applying technical knowledge in unfamiliar design contexts. ● Reading questions carefully and using command words correctly. (e.g. “justify”, “evaluate”). ● Structuring extended written responses for the exam. ● Time management in exam conditions.
Key vocabulary **(5- 10 words)**	Composite, alloy, renewable, lifecycle, inclusive design, obsolescence, just-in-time (JIT), market pull, design for manufacture (DFM), specification. sustainability, life cycle assessment, inclusive design, commercial manufacture, CAD/CAM, client needs
Planned trips / Clubs / links	https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification https://www.aqa.org.uk/subjects/design-and-technology/gcse/design-and-technology-8552/specification/scheme-of-assessment