

Subject: Design & Technology

Year group: 10

Department Curriculum Vision: GCSE D&T at Northwood consists of a range of creative, imaginative and innovative experiences of designing and practical based activities using a range of materials from three main areas: timber, metal-based materials and polymers.

	Autumn Term	
	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	• 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
Mid Term Assessment	Skill Box Skills and Knowledge Assessment		Section A topic tests.	
End Term Assessment	End of unit assessment of the skill box. Assessing the quality of the final outcome			
	Spring Term			
	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 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.		<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...)	<u>Practise NEA Project - Context - Childrens Toy</u> 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.		<u>Section B – Specialist Technical Principles</u> Specialist Material Areas • 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	• Turning • Laser cutting • CAD • TinkerCAD • Wax • Paint • Design • Development	• 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
Mid Term Assessment			Section B topic tests.	
End Term Assessment	End of unit assessment of the Childrens toy. Assessing the quality of the final outcome against GCSE NEA Criteria. • Identifying & Investigating design possibilities. • Producing a design brief & Specification • Generating design ideas			

	• Developing design ideas • Realising design ideas • Analysing & evaluating	
	Summer Term	
	GCSE NEA COURSEWORK NEA 50% GCSE	Knowledge
Content: (Know what...)	<u>Design & Make a product</u> 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 skills.	<u>Section C – Designing & Making Principles</u> 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	• 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 • Tolerances
Mid Term Assessment	Ongoing assessment. Each section marked and whole class feedback given for improvements to be made		Section C Topic Tests	
End Term Assessment			Year 10 PPE Assessment - June	
Additional information				
Homework	• Research Assignments • Sketching and Drawing • Analysis and Evaluation • Environmental and Ethical Studies		• Market Research • Design Development • Case Studies • Technical Skills Practice	
Extra curricular and enrichment opportunities	Afterschool Catchup sessions Saturday surgeries			
Useful links that will support learning	AQA Design and Technology GCSE Textbook - AQA GCSE Design & Technology:Timber, metal-based materials and polymers			

	ClearRevise AQA GCSE Design and Technology 8552
How parents can support learning	All pupils must be equipped with drawing and colouring equipment. Purchasing ClearRevise revision guide.