



INTENT

Our curriculum empowers students with a deep understanding of the designed and made world, equipping them with powerful design and practical skills to think creatively, critically, and sustainably about their role in shaping the future. In an ever-changing world with uncertain challenges, students will explore how design and technology can solve real-world problems and improve lives.

~	Prior learning	In Year 7 students build on the skills and knowledge learnt at Key Stage 2, where they were introduced to basic designing, making, and evaluating. They will deepen their understanding of materials, tools, and processes, moving from guided tasks to more independent and creative problem-solving.	
Ť	Conscious curriculum links	Science – Material Properties Maths – Converting Units of measurement (mm, cm, m, etc)	

	Project 1	Project 2							
	Animal Desk Tidy	Down Hill Race Car							
	This unit covers the properties, uses, and	This unit covers the properties and							
	environmental impact of various timbers,	classifications of polymers, focusing on their							
	including softwoods, hardwoods, and	use in product design alongside key physical							
	manufactured boards.	forces like gravity, friction, and air resistance.							
TOPIC/KNOWLEDGE	Students will learn to interpret design briefs, develop ideas through sketching, and explore different ways to inspire their designs by researching biomimicry: the design approach that looks to nature for inspiration, using animal forms, natural processes, and ecosystems to solve human problems and create innovative, efficient, and sustainable designs. Practical skills include safe workshop practices correct use of hand tools, planning making sequences, applying finishes, and evaluating finished products, while also fostering	Students will explore how factors such as wheel alignment, weight distribution, and surface contact impact speed and stability, and learn to improve designs by reducing friction and enhancing aerodynamics. Emphasis is placed on environmental responsibility through understanding plastic recycling, sustainable sourcing, safe tool use, accurate practical skills, and recording and analysing test results.							
	constructive feedback and self-reflection.								
	Students develop skills in accurately measuring, marking, and cutting timber								
SKILLS	e appearance and durability,								
and effectively sketching and annotating design ideas. They also learn to									
0,	plan and follow a structured making process,	as well as evaluate their work							
	and incorporate constructive feedback.								
_	Each project will have a mid and end of topic								
The mid-topic assessment will be a knowledge and skills test which will be self-assess inform both students and the teacher before moving through the rest of the topic. The end of topic assessment will include extended writing and will be teacher assessed.									
SM		, ,							
The end of topic assessment will include extended writing and will be teacher assessed Students will also be assessed on practical skill against a set success criteria.									
ASSE	1310denis wili diso be assessed on practical skili against a set success citiena.								
	Hard wood, Soft wood, Manufactured board,	PPE- Personal Protective equipment,							
AB	·	Accuracy, Tolerance- Quality control, Quality							
VOCAB	Pine, Oak, Dowel, Wood glue, Tenon Saw,	assurance, Innovative, Coniferous Tree,							
\ \	Coping saw, flat file, half round file	Deciduous Tree/Broad leaf tree							

READING SKILLS

In KS3 Design Technology, students learn key vocabulary before reading technical texts. While reading, they highlight material properties and design processes. After reading, they answer comprehension questions and discuss design choices, building confidence in interpreting briefs and applying knowledge to practical

PERSONAL DEVELOPMENT

CAREERS – Students explore careers in design, engineering, architecture, and manufacturing through classroom discussions, project links, and guest speakers. Career pathways are further highlighted during sixth form open evenings.

SUPPORTING STUDENTS AT HOME

Students will have a homework booklet to complete for each topic. Students can also be supported to revise and be tested on the content on their knowledge organisers.







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+	Prior learning	In Year 8, students build on the practical and theoretical knowledge developed in Year 7, applying their understanding of materials, tools, and processes to more complex and independent projects. They are introduced to working with a wider range of materials, including metals and plastics, and begin to explore how to combine these effectively in multimaterial products. Students develop greater confidence in planning, designing, and evaluating their work, with an increased focus on precision, functionality, and sustainability. Through more open-ended tasks, they are encouraged to think critically, solve problems creatively, and take greater ownership of their design decisions.		
Ť	Conscious curriculum links	Science – Electronics, properties of materials Maths – Unit conversions & measurements ICT – Using computer software Geography- Environmental issues		

Project 1 Project 2 **Up Hill Car (Electronics) Desk Organiser** This unit focuses on developing a comprehensive This unit introduces students to the fundamentals understanding of materials and their applications in of electronic and mechanical systems in design. It covers the functions of basic electronic design and manufacturing. components such as motors, switches, resistors, batteries, and wires, along with how to read and Students will learn the physical and working properties of hardwoods, softwoods, create simple circuit diagrams. thermoplastics, and common metals, and how to choose materials based on function, aesthetics, Students will explore mechanical principles cost, and sustainability. The project covers how including gear ratios, friction, traction, weight distribution, and balance, especially in relation to materials interact in combined products, the use of mechanical fasteners and adhesives, surface movement and performance. Material selection preparation, and methods for reinforcing structural for chassis and body construction is also integrity. examined. Students will also create design briefs and Through hands-on prototyping and testing, specifications tailored to user needs, while students engage in the iterative design process, considering environmental impacts, recycling, and learning how to refine their ideas based on waste disposal. Emphasis is placed on safe tool use, performance outcomes such as speed, distance, risk assessment, and the ability to evaluate a and incline capability. The unit also emphasizes finished product against its original design criteria. environmental awareness, particularly around battery use and electronic waste (WEEE) Students will accurately measure, mark, and cut various materials while safely using hand tools and machinery. They will apply joining techniques, create detailed technical drawings, and use CAD software to model designs. Additionally, they will develop practical skills in soldering, assembling mechanical components, managing projects, and evaluating products for function and aesthetics. Each project will have a mid and end of topic assessment. The mid-topic assessment will be a knowledge and skills test which will be self-assessed to inform both students and the teacher before moving through the rest of the topic. The end of topic assessment will include extended writing and will be teacher marked Students will also be assessed on practical skill against a set success criteria. Hardwood, Softwood, Acrylic, Alloy, Joining, Chassis, Motor, Circuit, Polarity, Gear Ratio, Finishing, Specification, User-Centered Design, Traction, Friction, Prototype, Soldering, Iteration Sustainability, Tolerance

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ENGINEERING





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Prior learning

Content 1 -9 during year 10 including – Engineering disciplines – application of SI Units- Hand drafted and CAD drawings – Tools and processes- Production planning- material properties.



GCSE course

Exam Board : NCFE Engineering-Exams – 1 Exam 40% NEA (Non-Exam Assessment) 60%

AUTUMN 1 and AUTUMN 2

Students will learn to understand the NEA brief and assessment objectives, write clear design briefs and specifications, and research existing products to analyse user needs.

They will explore engineering materials, sustainability, and ethical design, develop initial ideas through sketching and CAD, and plan project timelines with milestones.

Scienting 100s, mathetic components accurately assembling a working prototype.

Finally, students will test, evaluate their product of the components accurately assembling a working prototype.

Additionally, students will practice justifying material and process choices and presenting their ideas clearly in both written and visual formats.

SPRING 1 and SPRING 2

Students will refine their design ideas through iterative development and produce detailed technical drawings, both by hand and using CAD.

They will apply health and safety procedures while selecting tools, manufacturing components accurately, and assembling a working prototype.

Finally, students will test, evaluate their product against the original specification, suggest improvements, and complete their NEA portfolio.

SUMMER 1

Students will review core engineering materials, manufacturing processes, and workshop tools while practicing interpretation of technical drawings and exam questions.

They will develop revision strategies, apply knowledge to new scenarios, and use past papers for self-assessment.

Students will develop skills in conducting focused research and analysis, writing clear and justified specifications, planning project timelines with key stages, sketching and annotating design ideas, and selecting appropriate materials based on their research.

Students will develop skills in creating and refining design ideas through CAD and sketches, producing detailed technical drawings, modelling and testing concepts, completing prototypes to specification, and evaluating products while documenting the entire design process.

Students will build skills in answering exam-style questions accurately, applying knowledge to new scenarios, managing their time effectively, and writing extended responses that justify their design decisions.

SSMEN

Students are assessed through a combination of internal and external assessments. The internal assessment is the Non-Exam Assessment (NEA), where students complete a design and make project based on a set brief. This involves planning, designing, manufacturing, and evaluating a product, with marks awarded for research, development, practical skills, and documentation.

The external assessment is a written exam that tests students' knowledge of materials, tools, processes, health and safety, and engineering principles. Together, these assessments measure both practical ability and theoretical understanding, preparing students for further study or careers in engineering.

Evaluation, Plan, Manufacture, Quality Control, Testing, Design Folder, Client Needs, Functionality, Aesthetics.

Ferrous Metal, Non-Ferrous Metal, Thermoplastic, Thermosetting Plastic, Composite, Hardness, Toughness, Ductility, Malleability, Elasticity.

READING SKILLS

In NCFE Engineering, reading is embedded through technical texts, specifications, and case studies. Students develop subject-specific vocabulary and comprehension skills to interpret briefs, understand processes, and apply knowledge. This supports literacy while preparing learners for the demands of the NEA, written exam, and future engineering pathways.

PERSONAL DEVELOPMENT

Students develop teamwork, problem-solving, resilience, and career awareness through practical projects, real-world contexts, and engineering-related opportunities.

SUPPORTING STUDENTS AT HOME

Give support by encouraging reading of technical texts, helping with project planning, discussing engineering careers, and promoting problem-solving. Providing a quiet workspace and celebrating progress helps build confidence and independence throughout the NEA and exam preparation.

PRODUCT DESIGN YEA

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Prior learning

In preparation for Year 13, students will have completed the foundational elements of the AQA A-level Product Design course during Year 12. This includes a broad understanding of the design process, materials and their properties, manufacturing techniques, and the impact of design on society and the environment.



A-Level course

AQA A level Product design NEA - 50% of the course Paper 1 – 30% of the course Paper 2 - 20% of the course

OPIC/KNOWLEDGE

composites, and smart materials, and develop skills in sketching, annotation, and effective design communication. The course also introduces manufacturing processes, sustainability, and ethical design, alongside CAD modelling, context investigation, user research, and writing design briefs.

AUTUMN 1 and AUTUMN 2

Students will gain a clear understanding of

needs, and inclusive design principles.

They will study the properties of various

the AQA NEA requirements and assessment

objectives while exploring design theory, user

materials including woods, metals, polymers,

Time management and project planning skills are also developed to support the NEA

Students will develop proficiency in CAD software such as SolidWorks, Fusion 360, or SketchUp, and gain an understanding of CAM processes including CNC machining, 3D

They will also build strong workshop skills for safely working with wood, metal, and plastic, and learn to create prototypes to test and refine their design ideas.

printing, and laser cutting.

SPRING 1 and SPRING 2

Students will refine their design ideas through iterative development and modelling, producing detailed orthographic and isometric drawings while applying knowledge of tolerances, ergonomics, and anthropometrics.

They will use advanced CAD/CAM tools for prototyping, explore mechanical and electronic systems, and deepen their understanding of commercial manufacturing and quality control.

The course includes material testing, evaluation using technical and user feedback, and the completion of NEA development leading into the final prototype.

Students will also begin preparing for mock exams using past papers and effective revision strategies.

Students will learn effective idea generation techniques such as brainstorming, SCAMPER, and mind mapping, while developing the ability to communicate concepts through both hand-drawn and digital sketches.

They will apply user-centred design principles by focusing on empathy and user needs, and build aesthetic awareness through an understanding of form, colour, texture, and

SUMMER 1

In this final phase, students will complete the manufacture of their NEA prototype and finalise their folders with full documentation and evaluation.

They will review core technical principles and design theory, practise interpreting data and specifications, and apply their knowledge to unfamiliar design scenarios.

Emphasis is placed on exam preparation through extended writing, justification skills, and the use of revision tools such as flashcards, mind maps, and practice papers.

Students will reflect on their NEA journey, identify areas for improvement, and sit their final A-Level exams.

Students will review their understanding of material properties, uses, and sustainability, while exploring influential designers and key design eras.

They will evaluate existing products for function, form, and user experience, and apply life cycle analysis and sustainable design principles.

The course also develops skills in managing projects, meeting deadlines, testing and refining designs, and making informed decisions based on research and feedback

Students will be assessed through three key components:

Non-Examined Assessment (NEA) – 50% of A-Level

A substantial design and make project where students identify a real-world problem and develop a solution. The NEA is assessed on: Research and investigation, Design development and modelling, Making and realisation, Testing, analysis, and evaluation This project is completed independently over an extended period and is supported by a detailed design portfolio. Paper 1 – Technical Principles (30%)

A written exam that tests students' understanding of:

Materials and their properties, Manufacturing processes, Design theory and technical knowledge, Health and safety in design Format: Mixture of short and extended response questions.

Paper 2 – Designing and Making Principles (20%)

This paper focuses on:

The design process, User needs and product development, Social, moral, and environmental issues in design

Includes: A mix of data response, problem-solving, and extended design-based questions.

Anthropometrics, Ergonomics, Tolerances, Prototype, Iteration, CAD: Computer-Aided Design, CAM: Computer-Aided Manufacturing.

Sustainability, Smart Materials, User centered Design, Specification, design Brief, Isometric Drawing, Orthographic

Composite, Control, Manufacturing Processes, Evaluation, Client Needs, Functionality.

READING SKILLS

Reading is embedded through technical texts, design briefs, and case studies. Students interpret specifications, analyse articles, and extract key information to inform design decisions. This supports literacy, builds vocabulary, and prepares students for written exams and real-world design communication.

PERSONAL DEVELOPMENT

Students develop creativity, resilience, and critical thinking through independent design projects. They explore ethical design, sustainability, and realworld problem-solving. Collaboration, communication, and time management are embedded through NEA work and classroom activities, preparing students for higher education and careers in design, engineering, and manufacturing.

SUPPORTING STUDENTS AT **HOME**

- Encourage reading of design articles, case studies, and technical texts.
 - Discuss real-world design and engineering examples.
 - Support time management and NEA deadlines.
- Provide a quiet space for sketching, research, and CAD work.
 - Celebrate progress and effort throughout the design process.