

Longcroft School Curriculum Overview  
Design and Technology



# LONGCROFT

—SCHOOL AND SIXTH FORM COLLEGE—

## Longcroft School Mission Statement

Longcroft strives to be a positive, warm and welcoming school where pupils aim to do their very best and, with great heart, thought and vision, take pride in their achievements and those of our community. By constantly challenging our pupils to excel, we nurture aspiration and strive to cultivate a lifelong love of learning in our young people. We provide a creative, safe, inclusive and caring environment where every child is known and cared for as an individual. In this climate, every young person has the opportunity to thrive as they develop in personality, character and intellect and become a highly successful learner and individual.

## Longcroft School Curriculum Overview Design and Technology

### Introduction

This document outlines the curriculum and key considerations including:

- Aims and purpose
- Alignment with the whole school provision and curriculum intent
- A summary programme of study which includes sequencing of taught content

**We use the National Curriculum as our statutory foundation and broadly share its principles and aims including:**

- ‘To provide pupils with an introduction to the essential knowledge that they need to be educated citizens. To introduce pupils to the best that has been thought and said; and help engender an appreciation of human creativity and achievement’.
- To prepare students to be confident in themselves, to have a fulfilled and successful life beyond our school - one where they contribute positively to society.
- Our statutory curriculum is just one element in the education of every child. There is time and space in the school day and in each week, term and year to range beyond statutory specifications.
- Provision of a framework of core knowledge around which teachers can develop exciting and stimulating lessons to promote the development of pupils’ knowledge, understanding and skills as part of the wider school curriculum.
- The wider school curriculum includes an extensive range of opportunities and activities that are routinely available to students, are inclusive and reflect our diverse community.

### Inclusion

In accordance with our school curriculum statement, teachers will set high expectations for every pupil. They should plan stretching work for all pupils, including those whose attainment is significantly above the expected standard. There is an even greater obligation to plan lessons for pupils who have low levels of prior attainment or come from disadvantaged backgrounds. Evidence based approaches must be taken to respond to specific needs including students with special educational needs and those for whom English is not their first language; and be regularly reviewed. Teachers must at all times take account of their duties under equal opportunities legislation and act consistently with our vision and values.

### Numeracy and literacy

Teachers should take opportunities to develop pupils’ mathematical fluency, spoken language, reading, writing and vocabulary within their specific discipline and in line with the expectations laid out in our school curriculum statement.

### Purpose of study

‘Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others’ needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.’ Adapted from National Curriculum, DfE, 2014.

### Aims

The Longcroft School and Sixth Form curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- are prepared to effectively articulate their knowledge and skills in the way that best represents these in statutory assessments such that they have the requisite outcomes to enable the widest access of opportunity.

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### Subject Curriculum Vision

Our vision in Design Technology is simple: To provide real opportunities for support and academic growth in a fully inclusive environment for our students. This will allow them to be challenged, socially, morally and ethically in their understanding and knowledge of a rapidly advancing technological world.

We expect students to understand and retain key subject knowledge across a breadth of topics and in-depth analysis of design & manufacturing techniques, which when coupled with their own creativity, which we will endeavour to harness and cultivate at all times will provide them with the necessary transferrable and subject specific skills they need to succeed in the future.

Our curriculum reflects our core school values of Great Heart, Great Thought and Great Vision:

#### Great Heart

We encourage students to support each other socially, emotionally and academically in a fully inclusive technology department. The ethos we build here will allow students from all start points, all backgrounds to be supported by staff and pupils alike to ensure they have the necessary encouragement and support to maximise their potential.

#### Great Thought

We expect that all students are fully prepared for all the challenges which they will face in technology. We expect punctuality to lesson, full preparation for any tasks to be undertaken, whether that be a theory lesson or practical exam and finally high precision to detail. We expect that the same levels of commitment, professionalism and attention to detail are shown no matter what task you are undertaking with us.

#### Great Vision

We will always endeavour to provide a varied amount of opportunities for students to work in extracurricular topics in Technology. In a definitive effort to enhance our students' academic experience. We run clubs across each key stage, each technology sector to provide a safe space for students who wish to come and expand upon their interest, knowledge and enjoyment of all things technology. We are here to provide the necessary space and expertise for them to design, create and innovate.

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### Key subject skills

AO1	AO2	AO3	AO4
Identify, investigate and outline design possibilities to address needs and wants.	Design and make prototypes that are fit for purpose.	Analyse and evaluate: <ul style="list-style-type: none"> <li>• design decisions and outcomes, including for prototypes made by themselves and others</li> <li>• wider issues in design and technology.</li> </ul>	Demonstrate and apply knowledge and understanding of: <ul style="list-style-type: none"> <li>• technical principles</li> <li>• designing and making principles.</li> </ul>

### *Building on prior learning - What can students do by the end of KS2?*

#### Design

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

#### Make

- select from and use a wider range of tools and equipment to perform practical tasks, such as cutting, shaping, joining and finishing, accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

#### Evaluate

- investigate and analyse a range of existing products
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world

#### Technical knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products, such as gears, pulleys, cams, levers and linkages
- understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs, buzzers and motors
- apply their understanding of computing to programme, monitor and control their products.

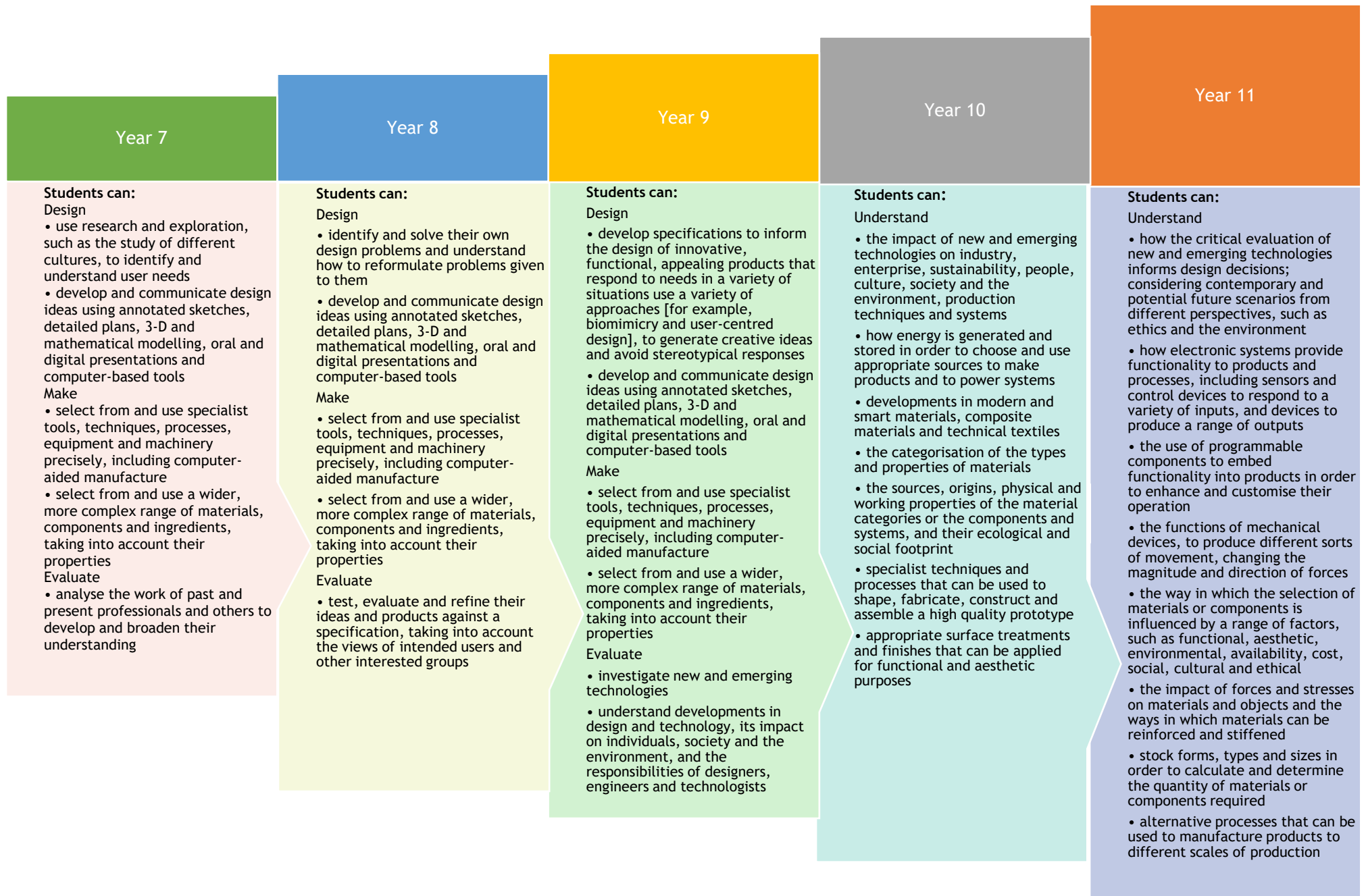
### *What are the skills gaps?*

There will be numerous gaps across all areas of the National Curriculum and Assessment Objectives due to the differences and application of technology teaching time in primary schools.

### *Baseline expectations*

- Ability to use different media to research
- Communicate designs using a range of techniques
- Understand basic tools and equipment and how to use them safely
- Use basic literacy skills to discuss existing products
- Show knowledge of existing materials

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### KS3 Technical knowledge - developed over the three-year course

- understand and use the properties of materials and the performance of structural elements to achieve functioning solutions
- understand how more advanced mechanical systems used in their products enable changes in movement and force
- understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]
- apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers]

### Designing and making principles - developed over the two-year course

- understand that all design and technological practice takes place within contexts which inform outcomes
- identify and understand client and user needs through the collection of primary and secondary data
- demonstrate an ability to write a design brief and specifications from their own and others' considerations of human needs, wants and interests
- investigate factors, such as environmental, social and economic challenges, in order to identify opportunities and constraints that influence the processes of designing and making
- explore and develop their ideas, testing, critically analysing and evaluating their work in order to inform and refine their design decisions thus achieving improved outcomes.
- investigate and analyse the work of past and present professionals and companies in the area of design and technology in order to help inform their own ideas
- use different design strategies, such as collaboration, user-centred design and systems thinking, to generate initial ideas and avoid design fixation
- develop, communicate, record and justify design ideas, applying suitable techniques, for example: formal and informal 2D and 3D drawing; system and schematic diagrams; annotated sketches; exploded diagrams; models; presentations; written notes; working drawings; schedules; audio and visual recordings; mathematical modelling; computer-based tools
- design and develop at least one prototype that responds to needs and/or wants and is fit for purpose, demonstrating functionality, aesthetics, marketability and consideration of innovation
- make informed and reasoned decisions, respond to feedback about their own prototypes (and existing products and systems) to identify the potential for further development and suggest how modifications could be made

In relation to at least one of the material categories, students are required to develop and apply in-depth knowledge by:

- selecting and working with appropriate materials and components in order to produce a prototype
- using appropriate and accurate marking out methods including: measuring and use of reference points, lines and surfaces; use templates, jigs and/or patterns; work within tolerances; understand efficient cutting and how to minimise waste
- using specialist tools and equipment, appropriate to the materials or components used (including hand tools, machinery, digital design and manufacture), to create a specific outcome
- using specialist techniques and processes to shape, fabricate, construct and assemble a high-quality prototype, including techniques such as wastage, addition, deforming and reforming, as appropriate to the materials and/or components being used
- using appropriate surface treatments and finishes for functional and aesthetic purposes

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Year	Autumn				Spring				Summer			
	Topic	Assessment	Skills tested	Links	Topic	Assessment	Skills tested	Links	Topic	Assessment	Skills tested	Links
7	Bug House  <b>Theory</b> : Client Profile, Perspective Drawing, Product Evaluations.  <b>Making</b> : Marking, Securing, Cutting, Removing Material, Surface Finishes.  This unit is taught in rotation to year 8 classes in either Autumn, Spring or Summer term	Completed practical piece.  Work Booklet  End of Unit Assessment	AO1	<b>Links to prior learning</b>  Baseline Expectations	Bug House  <b>Theory</b> : Client Profile, Perspective Drawing, Product Evaluations.  <b>Making</b> : Marking, Securing, Cutting, Removing Material, Surface Finishes.  This unit is taught in rotation to year 8 classes in either Autumn, Spring or Summer term	Completed practical piece.  Work Booklet  End of Unit Assessment	AO1	<b>Links to prior learning</b>  NC – Design NC – Make NC – Evaluate NC – Technical Knowledge	Bug House  <b>Theory</b> : Client Profile, Perspective Drawing, Product Evaluations.  <b>Making</b> : Marking, Securing, Cutting, Removing Material, Surface Finishes.  This unit is taught in rotation to year 8 classes in either Autumn, Spring or Summer term	Completed practical piece.  Work Booklet  End of Unit Assessment	AO1	<b>Links to prior learning</b>  NC – Design NC – Make NC – Evaluate NC – Technical Knowledge
			AO2				AO2				AO2	
			AO3	<b>How does this prepare students for future learning?</b>  Students can independently research and solve a problem. They can communicate their ideas. Use basic tools and equipment safely to make their product.			AO3	<b>How does this prepare students for future learning?</b>  Students can independently research and solve a problem. They can communicate their ideas. Use basic tools and equipment safely to make their product.			AO3	
			AO4				AO4				AO4	
8	Bug House  <b>Theory</b> : Client Profile, Perspective Drawing, Product Evaluations.  <b>Making</b> : Marking, Securing, Cutting, Removing Material, Surface Finishes.  This unit is taught in rotation to year 8 classes	Completed practical piece.  Work Booklet  End of Unit Assessment	AO1	<b>Links to prior learning</b>  Baseline Expectations	Bug House  <b>Theory</b> : Client Profile, Perspective Drawing, Product Evaluations.  <b>Making</b> : Marking, Securing, Cutting, Removing Material, Surface Finishes.  This unit is taught in rotation to year 8 classes in either Autumn, Spring or Summer term	Completed practical piece.  Work Booklet  End of Unit Assessment	AO1	<b>Links to prior learning</b>  NC – Design NC – Make NC – Evaluate NC – Technical Knowledge	Bug House  <b>Theory</b> : Client Profile, Perspective Drawing, Product Evaluations.  <b>Making</b> : Marking, Securing, Cutting, Removing Material, Surface Finishes.  This unit is taught in rotation to year 8 classes in either Autumn, Spring or Summer term	Completed practical piece.  Work Booklet  End of Unit Assessment	AO1	<b>Links to prior learning</b>  NC – Design NC – Make NC – Evaluate NC – Technical Knowledge
			AO2				AO2				AO2	
			AO3	<b>How does this prepare students for future learning?</b>  Students can independently research and solve a problem. They can communicate their ideas. Use basic tools and equipment safely to make their product.			AO3	<b>How does this prepare students for future learning?</b>  Students can independently research and solve a problem. They can communicate their ideas. Use basic tools and equipment safely to make their product.			AO3	
			AO4				AO4				AO4	



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	in either Autumn, Spring or Summer term			Students can independently research and solve a problem. They can communicate their ideas. Use basic tools and equipment safely to make their product.				Students can independently research and solve a problem. They can communicate their ideas. Use basic tools and equipment safely to make their product.			Students can independently research and solve a problem. They can communicate their ideas. Use basic tools and equipment safely to make their product.	
9	<p>Night Light</p> <p><b>Theory</b> : Brief, Context &amp; Analysis. Moodboard, CAD / CAM Skills, Product Assembly.</p> <p><b>Making</b> : CAD / CAM Skills, Laser Cutting, Soldering, Removing Materials.</p> <p>This unit is taught in rotation to year 9 classes in either Autumn, Spring or Summer term</p>	Completed practical piece. Work Booklet	<p>AO1</p> <p>AO2</p> <p>AO3</p> <p>AO4</p>	<p><b>Links to prior learning</b></p> <p>NC – Design NC – Make NC – Evaluate NC – Technical Knowledge</p> <p><b>How does this prepare students for future learning?</b></p> <p>Students can develop their own solutions to meet given specifications. They can communicate using a range of design media. They can select complex tools, equipment and processes suitable for their product. Students can evaluate the success of their project against the given criteria.</p>	<p>Night Light</p> <p><b>Theory</b> : Brief, Context &amp; Analysis. Moodboard, CAD / CAM Skills, Product Assembly.</p> <p><b>Making</b> : CAD / CAM Skills, Laser Cutting, Soldering, Removing Materials.</p> <p>This unit is taught in rotation to year 9 classes in either Autumn, Spring or Summer term</p>	Completed practical piece. Work Booklet	<p>AO1</p> <p>AO2</p> <p>AO3</p> <p>AO4</p>	<p><b>Links to prior learning</b></p> <p>NC – Design NC – Make NC – Evaluate NC – Technical Knowledge</p> <p><b>How does this prepare students for future learning?</b></p> <p>Students can develop their own solutions to meet given specifications. They can communicate using a range of design media. They can select complex tools, equipment and processes suitable for their product. Students can evaluate the success of their project against the given criteria.</p>	<p>Night Light</p> <p><b>Theory</b> : Brief, Context &amp; Analysis. Moodboard, CAD / CAM Skills, Product Assembly.</p> <p><b>Making</b> : CAD / CAM Skills, Laser Cutting, Soldering, Removing Materials.</p> <p>This unit is taught in rotation to year 9 classes in either Autumn, Spring or Summer term</p>	Completed practical piece. Work Booklet	<p>AO1</p> <p>AO2</p> <p>AO3</p> <p>AO4</p>	<p><b>Links to prior learning</b></p> <p>NC – Design NC – Make NC – Evaluate NC – Technical Knowledge</p> <p><b>How does this prepare students for future learning?</b></p> <p>Students can develop their own solutions to meet given specifications. They can communicate using a range of design media. They can select complex tools, equipment and processes suitable for their product. Students can evaluate the success of their project against the given criteria.</p>





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10	<p>Practical - Foot Stool</p> <p>Theory – Unit 3 Materials</p> <p>Theory – Unit 1 New &amp; Emerging Technologies</p>	<p>Completed practical piece. Work Booklet</p> <p>Work Booklet Homework Booklet Final Assessment</p> <p>Work Booklet Homework Booklet Final Assessment</p>	<p>AO1</p> <p>AO2</p> <p>AO3</p> <p>AO4</p>	<p><b>Links to prior learning</b></p> <p>NC – Design &amp; Make</p> <p>NC - Technical Knowledge</p> <p><b>How does this prepare students for future learning?</b></p> <p>Practical tasks prepare students for the rigors of NEA and the Theory Units will provide essential practice for exam success.</p>	<p>Practical - Cabinet</p> <p>Practical - Table</p> <p>Theory – Unit 2 Energy, Materials, Systems &amp; Devices</p> <p>Theory – Unit 5B Timbers</p>	<p>Completed practical piece. Work Booklet</p> <p>Completed practical piece. Work Booklet</p> <p>Work Booklet Homework Booklet Final Assessment</p> <p>Work Booklet Homework Booklet Final Assessment</p>	<p>AO1</p> <p>AO2</p> <p>AO3</p> <p>AO4</p>	<p><b>Links to prior learning</b></p> <p>NC – Make &amp; Evaluate</p> <p>NC - Technical Knowledge</p> <p><b>How does this prepare students for future learning?</b></p> <p>Practical tasks prepare students for the rigors of NEA and the Theory Units will provide essential practice for exam success.</p>	<p>Practical - NEA</p> <p>Theory – Section A Mock Exam (20)</p> <p>Theory – Unit 6 Designing Principles</p>	<p>Section A (10)</p> <p>Mock Examination</p> <p>Work Booklet Homework Booklet Final Assessment</p>	<p>AO1</p> <p>AO2</p> <p>AO3</p> <p>AO4</p>	<p><b>Links to prior learning</b></p> <p>NC - Design</p> <p>NC - Technical Knowledge</p> <p><b>How does this prepare students for future learning?</b></p> <p>Theory Units will provide essential practice for exam success. Mock exam provides real-time exam experience.</p>
	11	<p>Practical - NEA</p> <p>Theory – Unit 7 Making Principles</p> <p>Theory – Section C Mock Exam (50)</p> <p>Unit 4 – Common Specialist Technical Principles</p>	<p>Section B (10) Section C (20) Section D (20)</p> <p>Work Booklet Homework Booklet Final Assessment</p> <p>Mock Examination</p> <p>Work Booklet Homework Booklet Final Assessment</p>	<p>AO1</p> <p>AO2</p> <p>AO3</p> <p>AO4</p>	<p><b>Links to prior learning</b></p> <p>NC - Making</p> <p>NC - Technical Knowledge</p> <p><b>How does this prepare students for future learning?</b></p> <p>Theory Units will provide essential practice for exam success. Mock exam provides real-time exam experience.</p>	<p>Practical - NEA</p> <p>Theory – Unit 5B Timbers</p> <p>Theory – Section B Mock Exam (30)</p>	<p>Section E (20) Section F (20)</p> <p>Work Booklet Homework Booklet Final Assessment</p> <p>Mock Examination</p>	<p>AO1</p> <p>AO2</p> <p>AO3</p> <p>AO4</p>	<p><b>Links to prior learning</b></p> <p>NC - Evaluating</p> <p>NC - Technical Knowledge</p> <p><b>How does this prepare students for future learning?</b></p> <p>Theory Units will provide essential practice for exam success. Mock exam provides real-time exam experience.</p>			

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Enrichment Opportunities

Key stage	
KS3	<p>Technology Lunch Club: Everyday</p> <p>Technology Afterschool: Tuesday, Wednesday &amp; Thursday 3:15pm - 4:30pm</p> <p>This is an opportunity for students to catch up with any work which may be missing, or to complete any extracurricular work which they may want to undertake. The session is fluid and we are there to support students in whichever way they require.</p>
KS4	<p>Technology Lunch Club: Everyday</p> <p>Technology Afterschool: Tuesday, Wednesday &amp; Thursday 3:15pm - 4:30pm</p> <p>This is an opportunity for students to catch up with any work which may be missing, or to complete any extracurricular work which they may want to undertake. The session is fluid and we are there to support students in whichever way they require.</p>
KS5	