



# -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.

#### 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 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. Teacher's 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.





#### 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:

#### <u>Great Heart</u>

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.



#### Key subject skills

A01	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: • design decisions and outcomes, including	Demonstrate and apply knowledge and understanding of:
		for prototypes made by themselves and others • wider issues in design and technology.	<ul><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 computeraided 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



<ul> <li>select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties</li> <li>exaluate</li> <li>analyse the work of past and present professionals and others to develop and broaden their understanding</li> <li>test, evaluate and refine their is pocification, taking into account the views of intended users and other interested groups</li> <li>estect from and use specialist tools, techniques, processes, equipment and machinery procisely, including computer- aided manufacture</li> <li>select from and use specialist tools, techniques, processes, equipment and machinery procisely, including computer- aided manufacture</li> <li>select from and use specialist tools, techniques, processes, analyse the work of past and processent professionals and others to develop and broaden their understanding</li> <li>test, evaluate and refine their idex and products against a specification, taking into account the views of intended users and other interested groups</li> <li>select from and use specialist tools, techniques, processes, etal, and products against a specification, taking into account the views of intended users and other interested groups</li> <li>select from and use specialist tools, techniques, processes, components and ingredients, taking into account their properties</li> <li>Evaluate</li> <li>investigate new and emerging technologies</li> <li>understand developments in design and technology, its impact on individuals, society and the environment, and the eresponsibilities of designers,</li> <li>the sources, origins, physical and systems, and their ecological and social footalist techniques and processes that can be applied for functional and sethetic purpose</li> <li>the impact of forces a</li></ul>	Year 7	Year 8	Year 9	Year 10	Year 11
engineers and technologists the quantity of materials or components required • alternative processes that can be	<ul> <li>Design <ul> <li>use research and exploration,</li> <li>such as the study of different</li> <li>cultures, to identify and</li> <li>understand user needs <ul> <li>develop and communicate design</li> <li>ideas using annotated sketches,</li> <li>detailed plans, 3-D and</li> <li>mathematical modelling, oral and</li> <li>digital presentations and</li> <li>computer-based tools</li> </ul> </li> <li>Make <ul> <li>select from and use specialist</li> <li>tools, techniques, processes,</li> <li>equipment and machinery</li> <li>precisely, including computer-aided manufacture</li> <li>select from and use a wider,</li> <li>more complex range of materials,</li> <li>components and ingredients,</li> <li>taking into account their</li> <li>properties</li> <li>Evaluate</li> <li>analyse the work of past and</li> <li>present professionals and others to</li> </ul> </li> </ul></li></ul>	<ul> <li>Design <ul> <li>identify and solve their own design problems and understand how to reformulate problems given to them</li> <li>develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools</li> </ul> </li> <li>Make <ul> <li>select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer- aided manufacture</li> <li>select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties</li> </ul> </li> <li>Evaluate <ul> <li>test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and</li> </ul> </li> </ul>	<ul> <li>Design <ul> <li>develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses</li> <li>develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools</li> </ul> Make <ul> <li>select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture</li> <li>select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties Evaluate <ul> <li>investigate new and emerging technologies</li> <li>understand developments in design and technology, its impact on individuals, society and the environment, and the</li> </ul></li></ul></li></ul>	<ul> <li>Understand</li> <li>the impact of new and emerging technologies on industry, enterprise, sustainability, people, culture, society and the environment, production techniques and systems</li> <li>how energy is generated and stored in order to choose and use appropriate sources to make products and to power systems</li> <li>developments in modern and smart materials, composite materials and technical textiles</li> <li>the categorisation of the types and properties of the material categories or the components and systems, and their ecological and social footprint</li> <li>specialist techniques and processes that can be used to shape, fabricate, construct and assemble a high quality prototype</li> <li>appropriate surface treatments and finishes that can be applied for functional and aesthetic</li> </ul>	<ul> <li>Understand</li> <li>how the critical evaluation of new and emerging technologies informs design decisions; considering contemporary and potential future scenarios from different perspectives, such as ethics and the environment</li> <li>how electronic systems provide functionality to products and processes, including sensors and control devices to respond to a variety of inputs, and devices to produce a range of outputs</li> <li>the use of programmable components to embed functionality into products in order to enhance and customise their operation</li> <li>the functions of mechanical devices, to produce different sorts of movement, changing the magnitude and direction of forces</li> <li>the way in which the selection of materials or components is influenced by a range of factors, such as functional, aesthetic, environmental, availability, cost, social, cultural and ethical</li> <li>the impact of forces and stresses on materials and objects and the ways in which materials can be reinforced and stiffened</li> <li>stock forms, types and sizes in order to calculate and determine the quantity of materials or</li> </ul>



#### 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



	Autumn				Spring				Summer		
Year Topic	Assessment	Skills tested	Links	Topic	Assessment	Skills tested	Links	Topic	Assessment	Skills tested	Links
<ul> <li>7 Bug House</li> <li>Theory : Client Profile, Perspective Drawing, Product Evaluations.</li> <li>Making : Marking, Securing, Cutting, Removing Material, Surface Finishes.</li> <li>This unit is taught in rotation to year 8 classes in either Autumn, Spring or Summer term</li> </ul>	Completed practical piece. Work Booklet End of Unit Assessment	A01 A02 A03 A04	Links to prior learning Baseline Expectations How does this prepare students for future learning? Students can independently research and solve a problem. They can communicate their ideas. Use basic tools and equipment safely to make their product.	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	A01 A02 A03 A04	Links to prior learning NC – Design NC – Make NC – Evaluate NC – Technical Knowledge How does this prepare students for future learning? Students can independently research and solve a problem. They can communicate their ideas. Use basic tools and equipment safely to make	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	A01 A02 A03 A04	Links to prior learning NC – Design NC – Make NC – Evaluate NC – Technical Knowledge How does this prepare students for future learning? Students can independently research and solve a problem. They can communicate their ideas. Use basic tools and equipment safely to make
<ul> <li>8 Bug House</li> <li>Theory : Client Profile, Perspective Drawing, Product Evaluations.</li> <li>Making : Marking, Securing, Cutting, Removing Material, Surface Finishes.</li> <li>This unit is taught in rotation to year 8 classes</li> </ul>	Completed practical piece. Work Booklet End of Unit Assessment	A01 A02 A03	Links to prior learning Baseline Expectations How does this prepare students for future learning?	Bug House Theory : Client Profile, Perspective Drawing, Product Evaluations. Making : 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	A01 A02 A03	their product. Links to prior learning NC – Design NC – Make NC – Evaluate NC – Technical Knowledge How does this prepare students for future learning?	Bug House Theory : Client Profile, Perspective Drawing, Product Evaluations. Making : 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	A01 A02 A03	their product. Links to prior learning NC – Design NC – Make NC – Evaluate NC – Technical Knowledge How does this prepare students for future learning?



					Design a	and Technology						—SCHOOL AND SIXTH FORM COLLE
	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	Night Light Theory : Brief, Context & Analysis. Moodboard, CAD / CAM Skills, Product Assembly. Making : CAD / CAM Skills, Laser Cutting, Soldering, Removing Materials. This unit is taught in rotation to year 9 classes in either Autumn, Spring or Summer term	Completed practical piece. Work Booklet	A01 A02 A03	Links to prior learning NC – Design NC – Make NC – Evaluate NC – Technical Knowledge How does this prepare students for future learning? 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.	Night Light Theory : Brief, Context & Analysis. Moodboard, CAD / CAM Skills, Product Assembly. Making : CAD / CAM Skills, Laser Cutting, Soldering, Removing Materials. This unit is taught in rotation to year 9 classes in either Autumn, Spring or Summer term	Completed practical piece. Work Booklet	AO1 AO2 AO3	Links to prior learning NC – Design NC – Make NC – Evaluate NC – Technical Knowledge How does this prepare students for future learning? 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.	Night Light Theory : Brief, Context & Analysis. Moodboard, CAD / CAM Skills, Product Assembly. Making : CAD / CAM Skills, Laser Cutting, Soldering, Removing Materials. This unit is taught in rotation to year 9 classes in either Autumn, Spring or Summer term	Completed practical piece. Work Booklet	AO1 AO2 AO3	Links to prior learning NC – Design NC – Make NC – Evaluate NC – Technical Knowledge How does this prepare students for future learning? 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.



				Design	and Technology	, ,					-SCHOOL AND SIXTH FORM COLLEGE
Practical - Foot Stool	Completed practical	A01	Links to prior	Practical - Cabinet	Completed practical	A01	Links to prior	Practical - NEA	Section A (10)	AO1	Links to prior
	piece.	AO2	learning		piece.	AO2	learning			AO2	learning
	Work Booklet	AO3			Work Booklet	AO3		Theory – Section A Mock	Mock Examination	AO3	
			NC – Design &				NC – Make &	Exam (20)			NC - Design
Theory – Unit 3 Materials	Work Booklet		Make	Practical - Table	Completed practical		Evaluate				
	Homework Booklet				piece.			Theory – Unit 6 Designing	Work Booklet		NC - Technical
	Final Assessment		NC - Technical		Work Booklet		NC - Technical	Principles	Homework Booklet		Knowledge
Theory – Unit 1 New &			Knowledge				Knowledge		Final Assessment		
Emerging Technologies	Work Booklet			Theory – Unit 2 Energy,	Work Booklet			-			
	Homework Booklet	AO4	How does this	Materials, Systems &	Homework Booklet	AO4	How does this			AO4	How does this
	Final Assessment		prepare	Devices	Final Assessment		prepare				prepare
			students for		Mark Development		students for				students for
			future	Theory – Unit 5B Timbers	Work Booklet		future				future
			learning?		Homework Booklet		learning?				learning?
			Densilarit		Final Assessment		Development				The second states
			Practical tasks				Practical tasks				Theory Units
			prepare				prepare				will provide
			students for				students for				essential
			the rigors of				the rigors of				practice for
			NEA and the Theory Units				NEA and the				exam success. Mock exam
			will provide				Theory Units will provide				provides real-
			essential				essential				time exam
			practice for				practice for				experience.
			exam success.				exam success.				experience.
Practical - NEA	Section B (10)	A01	Links to prior	Practical - NEA	Section E (20)	A01	Links to prior				
	Section C (20)	AO2	learning		Section F (20)	A02	learning				
	Section D (20)	AO3				A03					
		705	NC - Making	Theory – Unit 5B Timbers	Work Booklet	703	NC - Evaluating				
Theory – Unit 7 Making	Work Booklet			,	Homework Booklet						
Principles	Homework Booklet		NC - Technical		Final Assessment		NC - Technical				
	Final Assessment		Knowledge	Theory – Section B Mock			Knowledge				
			Ŭ	Exam (30)	Mock Examination		Ŭ				
Theory – Section C Mock	Mock Examination	AO4	How does this			AO4	How does this				
Exam (50)			prepare				prepare				
			students for				students for				
Unit 4 – Common	Work Booklet		future				future				
Specialist Technical	Homework Booklet		learning?				learning?				
Principles	Final Assessment										
			Theory Units				Theory Units				
			will provide				will provide				
			essential				essential				
			practice for				practice for				
			exam success.				exam success.				
			Mock exam				Mock exam				
			provides real-				provides real-				
			time exam				time exam				
			experience.				experience.				



# **Enrichment Opportunities**

Key stage	
кรз	Technology Lunch Club: Everyday Technology Afterschool: Tuesday, Wednesday & Thursday 3:15pm - 4:30pm 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.
KS4	Technology Lunch Club: Everyday Technology Afterschool: Tuesday, Wednesday & Thursday 3:15pm - 4:30pm 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.
KS5	