

Longcroft School departmental curriculum overview
Design and Technology - Product Design

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"> design decisions and outcomes, including for prototypes made by themselves and others wider issues in design and technology. 	Demonstrate and apply knowledge and understanding of: <ul style="list-style-type: none"> technical principles designing and making principles.

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.

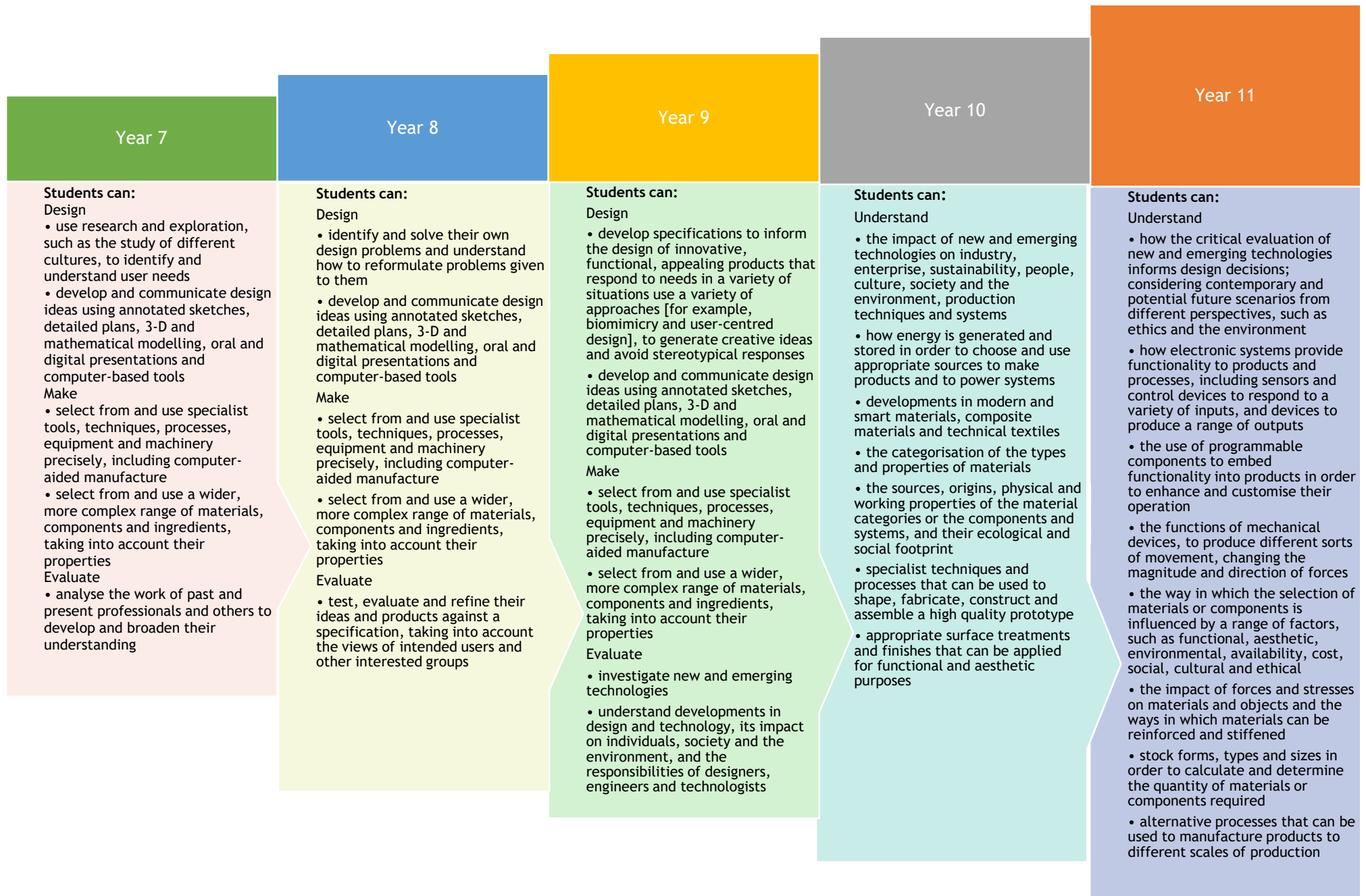
Baseline expectations

- Ability to use different media to research
- Communicate designs using a range of techniques
- Have an understanding of basic tools and equipment and how to use them safely
- Use basic literacy skills to discuss existing products

Longcroft School departmental curriculum overview
Design and Technology - Product Design

- Show knowledge of existing materials

Longcroft School departmental curriculum overview
Design and Technology - Product Design



Longcroft School departmental curriculum overview *Design and Technology - Product Design*

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

Longcroft School departmental curriculum overview
Design and Technology - Product Design

Year	Autumn				Spring				Summer			
	Topic	Assessment	Skills tested	Links	Topic	Assessment	Skills tested	Links	Topic	Assessment	Skills tested	Links
7			AO1 AO2 AO3 AO4	Links to prior learning How does this prepare students for future learning?			AO1 AO2 AO3 AO4	Links to prior learning How does this prepare students for future learning?			AO1 AO2 AO3 AO4	Links to prior learning How does this prepare students for future learning?
8	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	AO1 AO2 AO3 AO4	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 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	AO1 AO2 AO3 AO4	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 their product.	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	AO1 AO2 AO3 AO4	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 their product.
9	Night Light Theory : Brief, Context & Analysis. Moodboard, CAD	Completed practical piece. Work Booklet	AO1 AO2 AO3	Links to prior learning NC – Design	Night Light Theory : Brief, Context & Analysis. Moodboard, CAD	Completed practical piece. Work Booklet	AO1 AO2 AO3	Links to prior learning NC – Design	Night Light Theory : Brief, Context & Analysis. Moodboard, CAD	Completed practical piece. Work Booklet	AO1 AO2 AO3	Links to prior learning NC – Design



Longcroft School departmental curriculum overview
Design and Technology - Product Design

	<p>/ CAM Skills, Product Assembly.</p> <p>Making : 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>		<p>NC – Make NC – Evaluate NC – Technical Knowledge</p>	<p>/ CAM Skills, Product Assembly.</p> <p>Making : 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>		<p>NC – Make NC – Evaluate NC – Technical Knowledge</p>	<p>/ CAM Skills, Product Assembly.</p> <p>Making : 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>		<p>NC – Make NC – Evaluate NC – Technical Knowledge</p>
		AO4	<p>How does this prepare students for future learning?</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>		AO4	<p>How does this prepare students for future learning?</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>		AO4	<p>How does this prepare students for future learning?</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>
10	<p>Practical - Foot Stool</p> <p>Theory – Unit 3 Materials</p> <p>Theory – Unit 1 New & 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 AO2 AO3</p> <p>Links to prior learning</p> <p>NC – Design & Make</p> <p>NC - Technical Knowledge</p>	<p>Practical - Cabinet</p> <p>Practical - Table</p> <p>Theory – Unit 2 Energy, Materials, Systems & 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 AO2 AO3</p> <p>Links to prior learning</p> <p>NC – Make & Evaluate</p> <p>NC - Technical Knowledge</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 AO2 AO3</p> <p>Links to prior learning</p> <p>NC - Design</p> <p>NC - Technical Knowledge</p>
		AO4	<p>How does this prepare students for future learning?</p> <p>Practical tasks prepare</p>		AO4	<p>How does this prepare students for future learning?</p> <p>Practical tasks prepare</p>		AO4	<p>How does this prepare students for future learning?</p> <p>Theory Units will provide</p>



Longcroft School departmental curriculum overview
Design and Technology - Product Design

				students for the rigors of NEA and the Theory Units will provide essential practice for exam success.				students for the rigors of NEA and the Theory Units will provide essential practice for exam success.			essential practice for exam success. Mock exam provides real-time exam experience.
11	Practical - NEA	Section B (10) Section C (20) Section D (20)	AO1	Links to prior learning	Practical - NEA	Section E (20) Section F (20)	AO1	Links to prior learning			
			AO2								
			AO3								
	Theory – Unit 7 Making Principles	Work Booklet Homework Booklet Final Assessment		NC - Making			Theory – Unit 5B Timbers	Work Booklet Homework Booklet Final Assessment			
Theory – Section C Mock Exam (50)	Mock Examination	AO4	How does this prepare students for future learning?	Theory – Section B Mock Exam (30)	Mock Examination	AO4	How does this prepare students for future learning?	NC - Technical Knowledge			
Unit 4 – Common Specialist Technical Principles	Work Booklet Homework Booklet Final Assessment										
				Theory Units will provide essential practice for exam success. Mock exam provides real-time exam experience.				Theory Units will provide essential practice for exam success. Mock exam provides real-time exam experience.			