

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 for prototypes made by themselves and others wider issues in design and technology. 	Demonstrate and apply knowledge and understanding of:technical principlesdesigning 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 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
- Have an understanding of basic tools and equipment and how to use them safely
- Use basic literacy skills to discuss existing products



- Show knowledge of existing materials



Students can:Students can:Students can:Designuser research and exploration, such as the study of different cultures, to identify and suve their own design problems and understand down to reformulate problems given to themStudents can:Students can:Students can:• develop and communicate design if deas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based toolsDesignStudents can:Students can:Students can:• develop and communicate design digital presentations and computer-based tools- develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based toolsDesignStudents can:Students can:• develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based toolsDesignDesign- develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and ideas using annotated sketches, equipment and machinery precisely, including computer- alided manufactureStudents can:Students can:Students can:• develop and communicate design ideas using annotated sketches, equipment and machinery precisely, including computer- alided manufactureDesign and evelop and communicate design ideas using annotated sketches, evelop and communicate design of more complex raped finatcrueStudents can: Design and towe second to ensore and there compocial and evelop and communicate design of mo
engineers and technologists the quantity of materials or

 alternative processes that can be used to manufacture products to different scales of production



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



LegDidLineLinePatternPatternPattern7		Spring			Summer		
8 Bug House Completed practical piece. AO1 7 Theory : Client Profile, Perspective Drawing, Product Evaluations. Work Booklet AO3 8 Making : Marking, Securing, Cutting, Removing Material, AO1 AO2 AO2 AO1 AO2 AO3 Work Booklet AO3 AO3 Work Booklet AO3	Links Topic	Assessment	Links	Topic	Assessment	Skills tested	Links
This unit is taught in rotation to year 8 classes in either Autumn, Spring or Summer term	 learning How does this prepare students for future learning? Links to prior learning Baseline Expectations Product Evaluations. Making : Marking, Securing, Cutting, 	A01 A02 A03 A04 Completed practical A01 piece. A02 A03 Work Booklet End of Unit Assessment A04	How does this prepare students for future learning? Links to prior learning NC – Design NC – Make NC – Evaluate NC – Technical Knowledge	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 A04 A01 A02 A03	Links to prior learning How does this prepare students for future learning? Links to prior learning NC – Design NC – Design NC – Make NC – Evaluate NC – Evaluate 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 Completed practical AO1 piece. AO2 Theory : Brief, Context & Work Booklet AO3 Analysis. Moodboard, CAD	learning	Completed practical AO1 piece. AO2 Work Booklet AO3	Links to prior learning NC – Design	Night Light Theory : Brief, Context & Analysis. Moodboard, CAD	Completed practical piece. Work Booklet	A01 A02 A03	Links to prior learning NC – Design

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Longcroft School departmental curriculum overview Design and Technology - Product Design

				Design and Tech	nnology - Produc	ct Des	sign				-SCHOOL AND SIXTH FORM COLL
/ CAM Skills, Product			NC – Make	/ CAM Skills, Product			NC – Make	/ CAM Skills, Product			NC – Make
Assembly.			NC – Evaluate	Assembly.			NC – Evaluate	Assembly.			NC – Evaluate
			NC – Technical				NC – Technical				NC – Technical
Making : CAD / CAM			Knowledge	Making : CAD / CAM			Knowledge	Making : CAD / CAM			Knowledge
Skills, Laser Cutting,		AO4	How does this	Skills, Laser Cutting,		AO4	How does this	Skills, Laser Cutting,		AO4	How does this
Soldering, Removing			prepare	Soldering, Removing			prepare	Soldering, Removing			prepare
Materials.			students for	Materials.			students for	Materials.			students for
			future				future				future
This unit is taught in			learning?	This unit is taught in			learning?	This unit is taught in			learning?
rotation to year 9 classes				rotation to year 9 classes				rotation to year 9 classes			
in either Autumn, Spring			Students can	in either Autumn, Spring			Students can	in either Autumn, Spring			Students can
or Summer term			develop their	or Summer term			develop their	or Summer term			develop their
			own solutions				own solutions				own solutions
			to meet given				to meet given				to meet given
			specifications.				specifications.				specifications.
			They can				They can				They can
			communicate				communicate				communicate
			using a range				using a range				using a range
			of design				of design				of design
			media. They				media. They				media. They
			can select				can select				can select
			complex tools, equipment				complex tools, equipment				complex tools, equipment
			and processes				and processes				and processes
			suitable for				suitable for				suitable for
			their product.				their product.				their product.
			Students can				Students can				Students can
			evaluate the				evaluate the				evaluate the
			success of				success of				success of
			their project				their project				their project
			against the				against the				against the
			given criteria.				given criteria.				given criteria.
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	101				101	
	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	Theony Unit EP Timbers	Work Booklet		students for				students for
			future	Theory – Unit 5B Timbers	Homework Booklet		future				future
			learning?		Final Assessment		learning?				learning?
			Practical tasks		And Assessment		Practical tasks				Theory Units
			prepare								will provide
			piepaie				prepare				will provide

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Longcroft School departmental curriculum overview

			LU	Design and Tecl					LO —schoo	NGCROFT
			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.		exam Mock provi time	ice for success. c exam des real-
11 Practical - NEA Theory – Unit 7 Making Principles	Section B (10) Section C (20) Section D (20) Work Booklet Homework Booklet	AO2 AO3	Links to prior learning NC - Making NC - Technical	Practical - NEA Theory – Unit 5B Timbers	Section E (20) Section F (20) Work Booklet Homework Booklet Final Assessment	A01 A02 A03	Links to prior learning NC - Evaluating NC - Technical			
Theory – Section C Mock Exam (50)	Final Assessment Mock Examination	AO4	Knowledge How does this	Theory – Section B Mock Exam (30)	Mock Examination	AO4	Knowledge How does this			
Unit 4 – Common Specialist Technical Principles	Work Booklet Homework Booklet Final Assessment		prepare students for future learning?				prepare students for future learning?			
			Theory Units will provide essential practice for exam success. Mock exam provides real-				Theory Units will provide essential practice for exam success. Mock exam provides real-			

time exam

experience.

time exam

experience.

