Primary-aged groups

- This document should be read in conjunction with the Primary Topic Curriculum document where this subject is taught in a cross-curricular approach.

Whole School Curriculum Plan 2021-2022

Subject: Design & Technology

Year 7

		Autumn Term 2021		Spring Term 2022		Summer Term 2022	
	Year group in class	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Newts	7	Knowledge, Skills and Understanding ● Follow procedures for health and safety ● Understand the process of risk assessment ● Use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely ● Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups	Knowledge, Skills and Understanding ● Follow procedures for health and safety ● Understand the process of risk assessment ● Use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely ● Make use of specialist equipment to mark out materials ● Includes a simple mechanism in their product ● Evaluate their products against their original specification and identify ways of improving them	Knowledge, Skills and Understanding ● Investigate and analyse products through disassembly to determine how they are constructed and function ● The positive and negative impact that products can have in the wider world ● Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives ● Actively involve others in the testing of their products ● Use learning from science to help design and make products that work ● Use learning from mathematics to help design and make products that work ● How to use simple electronic circuits incorporating inputs and outputs ● Refers to designs and plans when making ● Designs products to be used in different contexts	Knowledge, Skills and Understanding ● Use a wider, more complex range of materials, components, taking into account their properties ● Apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods ● Attempts to improve the finish of their model ● Refers to designs and plans when making ● Designs products to be used in different contexts	Knowledge, Skills and Understanding ● Analyse the work of past and present professionals and others to develop and broaden their understanding ● Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists	Knowledge, Skills and Understanding ● Use 2D and begin to use 3D CAD packages to model their ideas ● Produce models of their ideas using CAM to test out their ideas ● Exploit the use of CAD/CAM equipment to manufacture products, increasing standards of quality, scale of production and precision ● Use CAD/CAM to produce and apply surface finishing techniques
		Topic(s) Health & safety: Workshop passport: being safe in the workshop, overview of machines and main tools (2 weeks) Coin roll moneybox (5 weeks)	Topic(s) Mechanisms: Design & make a linkage toy (7 weeks)	Topic(s) Electronics: Design & make a buzz wire game (6 weeks) Dyson vacuum cleaner/fan disassembly project (1 week)	Topic(s) Finishing: Design & make a scale model vehicle (6 weeks)	Topic(s) Design in context: Great designers research project (5 weeks)	Topic(s) 2D & 3D: 2D drawing styles (2 weeks) 3D CAD project (5 weeks)

Year 7 (Continued)

		Autumn Term 2021		Spring Term 2022		Summer Term 2022	
	Year group in class	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Shrews	7	Knowledge, Skills and Understanding ● Follow procedures for health and safety ● Understand the process of risk assessment ● Use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely ● Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups	Knowledge, Skills and Understanding ● Follow procedures for health and safety ● Understand the process of risk assessment ● Use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely ● Make use of specialist equipment to mark out materials ● Includes a simple mechanism in their product ● Evaluate their products against their original specification and identify ways of improving them ● Use a wider, more complex range of materials, components, taking into account their properties	Knowledge, Skills and Understanding ● Investigate and analyse products through disassembly to determine how they are constructed and function ● The positive and negative impact that products can have in the wider world ● Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives ● Actively involve others in the testing of their products ● Use learning from science to help design and make products that work ● Use learning from mathematics to help design and make products that work ● How to use simple electronic circuits incorporating inputs and outputs ● Refers to designs and plans when making ● Designs products to be used in different contexts	Knowledge, Skills and Understanding ● Use a wider, more complex range of materials, components, taking into account their properties ● Apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods ● Attempts to improve the finish of their model ● Refers to designs and plans when making ● Designs products to be used in different contexts	Knowledge, Skills and Understanding ● Analyse the work of past and present professionals and others to develop and broaden their understanding ● Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists	Knowledge, Skills and Understanding ● Use 2D and begin to use 3D CAD packages to model their ideas ● Produce models of their ideas using CAM to test out their ideas ● Exploit the use of CAD/CAM equipment to manufacture products, increasing standards of quality, scale of production and precision ● Use CAD/CAM to produce and apply surface finishing techniques
		Topic(s) Workshop passport: being safe in the workshop Overview of machines and main tools (2 weeks) Coin roll moneybox (5 weeks)	Topic(s) New materials: Epoxy resin keyring (1 week) Mechanisms: Design & make a linkage toy (6 weeks)	Topic(s) Electronics: Design & make a buzz wire game (6 weeks) Dyson vacuum cleaner/fan disassembly project (1 week)	Topic(s) Finishing: Design & make a scale model vehicle (6 weeks)	Topic(s) Design in context: Great designers research project (5 weeks)	Topic(s) Isometric drawing 3D CAD project (7 weeks)

Whole School Curriculum Plan 2021-2022

Subject: Design & Technology

Year 8

		Autumn Term 2021		Spring Term 2022		Summer Term 2022	
	Year group in class	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Voles	8	Knowledge, Skills and Understanding • Follow procedures for health and safety • Understand the process of risk assessment • Select appropriately from specialist tools, techniques, processes, equipment and machinery, including computer-aided manufacture • Should investigate and analyse new and emerging technologies • Use a wider, more complex range of materials, components, taking into account their properties	Knowledge, Skills and Understanding • Apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods • Attempts to improve the finish of their model • Refers to designs and plans when making • Designs products to be used in different contexts • Work confidently within a range of relevant domestic, local and industrial contexts	Knowledge, Skills and Understanding • Use research including the study of different cultures, to identify and understand user needs • Identify and solve their own design problems • Produce ordered sequences and schedules for manufacturing products they design, detailing resources required • Investigate and analyse products through disassembly to determine how they are constructed and function • The positive and negative impact that products can have in the wider world • Should know about an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making	Knowledge, Skills and Understanding • Use 3D CAD to model, develop and present their ideas and validate their designs in advance of manufacture • select appropriate methods to evaluate their products in use and modify them to improve performance • Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives	Knowledge, Skills and Understanding • How more advanced electrical and electronic systems can be powered and used in their products • Work confidently within a range of relevant domestic, local and industrial contexts • Identify and solve their own design problems • Produce ordered sequences and schedules for manufacturing products they design, detailing resources required	Knowledge, Skills and Understanding • Select appropriately from a wider, more complex range of materials, components and ingredients, taking into account their properties such as water resistance and stiffness • Understand how more advanced mechanical systems used in their products enable changes in movement and force
		Topic(s) New technologies: LED nightlight (5 weeks) Resin keyring (1 week) Resin light (4 weeks)	Topic(s) Mechanisms: Pull-along toy (4 weeks)	Topic(s) Designers and their role in the world (6 weeks) Dyson disassembly project (1 week)	Topic(s) Measuring & cutting: Design & make a board game (5 weeks) Introduction to wood joints (1 week)	Topic(s) Mechanisms 2: Design & make a self-propelled vehicle (5 weeks)	Topic(s) Finishing: (7 weeks)

Year 8 (continued)

		Autumn Term 2021		Spring Term 2022		Summer Term 2022	
	Year group in class	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Hedgehogs	8	Knowledge, Skills and Understanding ● Follow procedures for health and safety ● Understand the process of risk assessment ● Select appropriately from specialist tools, techniques, processes, equipment and machinery, including computer-aided manufacture ● Should investigate and analyse new and emerging technologies ● Use a wider, more complex range of materials, components, taking into account their properties	Knowledge, Skills and Understanding ● Apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods ● Attempts to improve the finish of their model ● Refers to designs and plans when making ● Designs products to be used in different contexts ● Work confidently within a range of relevant domestic, local and industrial contexts	Knowledge, Skills and Understanding ● Use research including the study of different cultures, to identify and understand user needs ● Identify and solve their own design problems ● Produce ordered sequences and schedules for manufacturing products they design, detailing resources required ● Investigate and analyse products through disassembly to determine how they are constructed and function ● The positive and negative impact that products can have in the wider world ● Should know about an increasing range of designers, engineers, technologists and manufacturers and be able to relate their products to their own designing and making	Knowledge, Skills and Understanding ● Use 3D CAD to model, develop and present their ideas and validate their designs in advance of manufacture ● select appropriate methods to evaluate their products in use and modify them to improve performance ● Use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives	Knowledge, Skills and Understanding ● How more advanced electrical and electronic systems can be powered and used in their products ● Work confidently within a range of relevant domestic, local and industrial contexts ● Identify and solve their own design problems ● Produce ordered sequences and schedules for manufacturing products they design, detailing resources required	Knowledge, Skills and Understanding ● Select appropriately from a wider, more complex range of materials, components and ingredients, taking into account their properties such as water resistance and stiffness ● Understand how more advanced mechanical systems used in their products enable changes in movement and force
		Topic(s) New technologies: LED nightlight (5 weeks) Resin keyring (1 week) Resin light (4 weeks)	Topic(s) Mechanisms: Pull-along toy (4 weeks)	Topic(s) Designers and their role in the world (6 weeks) Dyson disassembly project (1 week)	Topic(s) Measuring & cutting: Design & make a board game (5 weeks) Introduction to wood joints (1 week)	Topic(s) Mechanisms 2: Design & make a self-propelled vehicle (5 weeks)	Topic(s) Finishing: (7 weeks)

Whole School Curriculum Plan 2021-2022

Subject: Design & Technology

Year 9

		Autumn Term 2021		Spring Term 2022		Summer Term 2022	
	Year group in class	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Stoats	9	Knowledge, Skills and Understanding • Investigate and develop skills in modifying the appearance of materials including textiles and other manufactured materials • Work confidently within a range of relevant domestic, local and industrial contexts • Investigate and analyse products through disassembly to determine how they are constructed and function • Develop and communicate design ideas using annotated sketches • Produce 3D models to develop and communicate ideas	Knowledge, Skills and Understanding • Develop and communicate design ideas using annotated sketches • Produce 3D models to develop and communicate ideas • Investigate and analyse products that they are less familiar with using themselves • Develop detailed design specifications to guide their thinking • Produce costings using spreadsheets for products they design and make • Produce ordered sequences and schedules for manufacturing products they design, detailing resources required	Knowledge, Skills and Understanding • Develop circuits or gearing systems • Embed intelligence in products that respond to inputs • Make use of sensors to detect heat, light, sound and movement • How to apply the concepts of feedback in systems • How to control outputs such as actuators and motors • How to make use of microcontrollers in products they design and manufacture themselves	Knowledge, Skills and Understanding • Create production schedules that inform their own and others' roles in the manufacturing of products they design • Make simple use of planning tools, for instance Gant charts • Communicate their plans clearly so that others can implement them • Match and select suitable materials considering their fitness for purpose adapt their methods of manufacture to changing circumstances • Recognise when it is necessary to develop a new skill or technique • How to classify materials by structure e.g. hard words, softwoods, ferrous and non-ferrous, thermoplastic and thermosetting plastics • How materials can be cast in moulds	Knowledge, Skills and Understanding • Use a variety of approaches, for example biomimicry and user-centred design, to generate creative ideas and avoid stereotypical responses • Decide which design criteria clash and determine which should take priority • Produce short reports, making suggestions for improvements products considering life cycle analysis • How products can be developed considering the concept of 'cradle to grave' • how to make adjustments to the settings of equipment and machinery	Knowledge, Skills and Understanding • Use specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations • develop design specifications that include a wider range of requirements such as environmental, aesthetic, cost, maintenance, quality and safety • Research the health and wellbeing, cultural, religious and socio-economic contexts of their intended users • Understand how to reformulate design problems given to them
		Topic(s) Upcycling: transform a chair! (4 weeks) Entry-level project: choice of design brief (3 weeks)	Topic(s) Entry-level project: choice of design brief (5 weeks) Make a vehicle using found materials (2 weeks)	Topic(s) 3D CAD project (7 weeks)	Topic(s) New materials & technologies (2 weeks theory/4 weeks design task)	Topic(s) Existing products: how can they be improved? (5 weeks)	Topic(s) Design specification: write a specification and design a product (1 weeks theory/6 weeks design task)

Year 9 (continued)

		Autumn Term 2021		Spring Term 2022		Summer Term 2022	
	Year group in class	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Otters	9	Knowledge, Skills and Understanding • Investigate and develop skills in modifying the appearance of materials including textiles and other manufactured materials • Work confidently within a range of relevant domestic, local and industrial contexts • Investigate and analyse products through disassembly to determine how they are constructed and function • Develop and communicate design ideas using annotated sketches • Produce 3D models to develop and communicate ideas	Knowledge, Skills and Understanding • Develop and communicate design ideas using annotated sketches • Produce 3D models to develop and communicate ideas • Investigate and analyse products that they are less familiar with using themselves • Develop detailed design specifications to guide their thinking • Produce costings using spreadsheets for products they design and make • Produce ordered sequences and schedules for manufacturing products they design, detailing resources required	Knowledge, Skills and Understanding • Develop circuits or gearing systems • Embed intelligence in products that respond to inputs • Make use of sensors to detect heat, light, sound and movement • How to apply the concepts of feedback in systems • How to control outputs such as actuators and motors • How to make use of microcontrollers in products they design and manufacture themselves	Knowledge, Skills and Understanding • Create production schedules that inform their own and others' roles in the manufacturing of products they design • Make simple use of planning tools, for instance Gant charts • Communicate their plans clearly so that others can implement them • Match and select suitable materials considering their fitness for purpose adapt their methods of manufacture to changing circumstances • Recognise when it is necessary to develop a new skill or technique • How to classify materials by structure e.g. hard words, softwoods, ferrous and non-ferrous, thermoplastic and thermosetting plastics • How materials can be cast in moulds	Knowledge, Skills and Understanding • Use a variety of approaches, for example biomimicry and user-centred design, to generate creative ideas and avoid stereotypical responses • Decide which design criteria clash and determine which should take priority • Produce short reports, making suggestions for improvements products considering life cycle analysis • How products can be developed considering the concept of 'cradle to grave' • how to make adjustments to the settings of equipment and machinery	Knowledge, Skills and Understanding • Use specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations • develop design specifications that include a wider range of requirements such as environmental, aesthetic, cost, maintenance, quality and safety • Research the health and wellbeing, cultural, religious and socio-economic contexts of their intended users • Understand how to reformulate design problems given to them
		Topic(s) Upcycling: transform a chair! (4 weeks) Entry-level project: choice of design brief (3 weeks)	Topic(s) Entry-level project: choice of design brief (5 weeks) Make a vehicle using found materials (2 weeks)	Topic(s) 3D CAD project (7 weeks)	Topic(s) New materials & technologies (2 weeks theory/4 weeks design task)	Topic(s) Existing products: how can they be improved? (5 weeks)	Topic(s) Design specification: write a specification and design a product (1 weeks theory/6 weeks design task)

Whole School Curriculum Plan 2021-2022

Subject: Design & Technology

Year 10

		Autumn Term 2021		Spring Term 2022		Summer Term 2022	
	Year group in class	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Badgers & Foxes	10	Knowledge, Skills and Understanding • Understand the categorisation of the types and properties of papers and boards, natural and manufactured timber, ferrous and non-ferrous metals, thermoforming and thermosetting polymers, natural, synthetic, blended and mixed fibres, and woven, non-woven and knitted textiles • Understand 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 • Understand the appropriate surface treatments and finishes that can be applied for functional and aesthetic purposes • 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	Knowledge, Skills and Understanding • Understand the impact of new and emerging technologies on industry, enterprise, sustainability, people, culture, society and the environment, production techniques and systems • Consider contemporary and potential future scenarios from different perspectives, such as ethics and the environment • Understand 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 • Selecting and working with appropriate materials and components in order to produce a prototype • Understand developments in modern and smart materials, composite materials and technical textiles	Knowledge, Skills and Understanding • Use specialist tools and equipment, appropriate to the materials or components used (including hand tools, machinery, digital design and manufacture), to create a specific outcome • Use appropriate surface treatments and finishes for functional and aesthetic purposes	Knowledge, Skills and Understanding • 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 • 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 • 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	Knowledge, Skills and Understanding • Understand the functions of mechanical devices, to produce different sorts of movement, changing the magnitude and direction of forces • Understand the impact of forces and stresses on materials and objects and the ways in which materials can be reinforced and stiffened	Knowledge, Skills and Understanding • 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
		Topic(s) GCSE AQA Design & Technology Materials Bird box (3 weeks) Sweet dispenser (6 weeks)	Topic(s) New technology, systems and the environment Electronics project (5 weeks)	Topic(s) Manufacturing processes, tools and equipment Epoxy resin (5 weeks) Silicone lego figure (2 weeks)	Topic(s) Design 1 Research and design specification (3 weeks) Wood joints (3 weeks)	Topic(s) Material management, tolerances, forces and stresses Group project: outdoor furniture (5 weeks)	Topic(s) Design 2 Design movements project (5 weeks) Choosing brief for NEA in Yr11 (2 weeks)

Whole School Curriculum Plan 2021-2022

Subject: Design & Technology

Year 11

		Autumn Term 2021		Spring Term 2022		Summer Term 2022	
	Year group in class	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Boars & Deer	11	Knowledge, Skills and Understanding ● Identifying and investigating design possibilities ● Producing a design brief and specification	Knowledge, Skills and Understanding ● Generating design ideas ● Developing design ideas ● Realising design ideas	Knowledge, Skills and Understanding ● Realising design ideas	Knowledge, Skills and Understanding ● Analysing and evaluating	Knowledge, Skills and Understanding Revision of 6 key topics: ● Materials ● Design ● New technology, systems and the environment ● Manufacturing processes, tools and equipment ● Material management, tolerances, forces and stresses	Knowledge, Skills and Understanding
		Topic(s) GCSE AQA Design & Technology ● Materials theory (2 weeks) ● NEA PowerPoint: Phase 1 (5 weeks)	Topic(s) ● New technology, systems and the environment theory (3 weeks) ● NEA PowerPoint: Phase 1 (4 weeks) ● NEA prototyping (2 weeks)	Topic(s) ● Manufacturing processes, tools and equipment theory (3 weeks) ● NEA PowerPoint: Phase 2 (4 weeks) ● NEA prototyping (2 weeks)	Topic(s) ● Design theory (2 weeks) ● NEA PowerPoint: Phase 2 & 3 (4 weeks) ● NEA prototyping (2 weeks) ● Internal NEA deadline 7 April 2022, NEA deadline 6 May 2022	Topic(s) ● Revision of topics in preparation for exam (50% of overall mark)	Topic(s) ● Exam date: 15 June 2022 pm, 2 hrs