DESIGN TECHNOLOGY

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.

Aims

The national 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
- understand and apply the principles of nutrition and learn how to cook

Early Years Three and Four Years Olds	<u>Personal, Social and Emotional Development</u> ➢ Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen or one which is suggested to them.	<u>Understanding the World</u> ➢ Explore how things work.
	<u>Physical Development</u> ➢ Use large-muscle movements to wave flags and streamers, paint and make marks. ➢ Choose the right resources to carry out their own plan. Use one-handed tools and equipment, for example, making snips in paper with scissors.	<u>Expressive Arts and Design</u> ➢ Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park. ➢ Explore different materials freely, in order to develop their ideas about how to use them and what to make. ➢ Develop their own ideas and then decide which materials to use to express them. Create closed shapes with continuous lines, and begin to use these shapes to represent objects.
Early Years Reception	<u>Physical Development</u> ➢ Progress towards a more fluent style of moving, with developing control and grace. ➢ Develop their small motor skills so that they can use a range of tools competently, safely and confidently. ➢ Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.	<u>Expressive Arts and Design</u> ➢ Explore, use and refine a variety of artistic effects to express their ideas and feelings. ➢ Return to and build on their previous learning, refining ideas and developing their ability to represent them. ➢ Create collaboratively, sharing ideas, resources and skills.
KS 1 Statements KS 2 Statements	➢ to design purposeful, functional, appealing products for themselves and other users based on design criteria ➢ to generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups	➢ to 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

	and, where appropriate, information and communication technology ➢ to select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] ➢ to select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics ➢ to explore and evaluate a range of existing products ➢ to evaluate their ideas and products against design criteria ➢ to build structures, exploring how they can be made stronger, stiffer and more stable ➢ to explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products ➢ use the basic principles of a healthy and varied diet to prepare dishes ➢ understand where food comes from.	➢ to generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design ➢ to select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately ➢ to 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 ➢ to investigate and analyse a range of existing products ➢ to evaluate their ideas and products against their own design criteria and consider the views of others to improve their work ➢ to understand how key events and individuals in design and technology have helped shape the world ➢ to apply their understanding of how to strengthen, stiffen and reinforce more complex structures ➢ to understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] ➢ to understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] ➢ to apply their understanding of computing to program, monitor and control their products. ➢ understand and apply the principles of a healthy and varied diet ➢ prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques ➢ understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

Design Technology Knowledge Categories

Technical Knowledge Develop knowledge of design and making techniques.
Practical Knowledge Develop the practical skills needed to make high quality products.
Design Inspiration Appreciate the design process that has influenced the products we use in everyday life.
Design Process Develop the process of design thinking and seeing design as a process.

	Year 1 – DT					
	AUT 1	**AUT 2**	**SPR 1**	**SPR 2**	**SUM 1**	**SUM 2**
Enquiry Question/ Theme	Cooking/ Nutrition Fruit kebabs			Structures Bridge Building	Mechanisms Moving Creatures	
Milestone Coverage	**Food** Peel ingredients safely and hygienically. Assemble or cook ingredients.			**Materials** Cut materials safely using tools provided. Measure to the nearest centimetre. Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).	**Mechanics** Create products using levers, wheels and winding mechanisms. **Materials** Cut materials safely using tools provided.	
Knowledge Categories	Technical Knowledge Practical Knowledge			Technical Knowledge Practical Knowledge Design Inspiration Design Process	Technical Knowledge Practical Knowledge Design Process	
Design, Make, Evaluate, Improve	Design products that have a clear purpose and an intended user. Make products, refining the design as work progresses.					
Take inspiration from design throughout History	Explore objects and designs to identify likes and dislikes of the designs. Suggest improvements to existing designs. Explore how products have been created.					

Continuous provision	**Designers** Display a range of designer's work. 'Designer of the Month'. DT vocabulary to label/ describe their work. **Innovation Area** Suggest improvements to existing designs. Provide paper, pencils, photos of designs as a stimulus and a resource to build with eg. coloured lolly sticks. **Devices and Apps** Access a range of devices and apps to explore draw/ making techniques. **Books** An Engineer like me/ A Mathematician like me

	Year 2 - DT					
	AUT 1	**AUT 2**	**SPR 1**	**SPR 2**	**SUM 1**	**SUM 2**
Enquiry Question/ Theme	Textiles Delightful Decorations		Structures Flying Kites		Cooking/ Nutrition Perfect Pizzas	
Milestone Coverage	**Textiles** Shape textiles using templates. Join textiles using running stitch. Colour and decorate textiles using a number of techniques (such as adding sequins or printing). **Materials** Cut materials safely using tools provided.		**Materials** Cut materials safely using tools provided. Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). Demonstrate a range of joining techniques (such as gluing or combining materials to strengthen). Measure and mark out to the nearest centimetre.		**Food** Cut, peel or grate ingredients safely and hygienically. Measure or weigh using measuring cups or electronic scales. Assemble or cook ingredients.	
Knowledge Categories	Technical Knowledge Practical Knowledge Design Process		Technical Knowledge Practical Knowledge Design Process		Technical Knowledge Practical Knowledge Design Inspiration Design Process	
Design, Make, Evaluate, Improve	Design products that have a clear purpose and an intended user. Make products, refining the design as work progresses.					
Take inspiration from	Explore objects and designs to identify likes and dislikes of the designs. Suggest improvements to existing designs.					

design throughout History	Explore how products have been created.
Continuous provision	**Designers** Display a range of designer's work. 'Designer of the Month'. DT vocabulary to label/ describe their work. **Innovation Area** Suggest improvements to existing designs. Provide paper, pencils, photos of designs as a stimulus and a resource to build with eg. coloured lolly sticks. **Devices and Apps** Access a range of devices and apps to explore draw/ making techniques. **Books** An Engineer like me/ A Mathematician like me

	Year 3 - DT					
	AUT 1	**AUT 2**	**SPR 1**	**SPR 2**	**SUM 1**	**SUM 2**
Enquiry Question/ theme		Mechanisms Moving Storybooks	Cooking/ Nutrition Baking Bread			Structures Egg Protector
Milestone Coverge		**Materials** Cut materials accurately and safely by selecting appropriate tools. Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut-outs). Select appropriate joining techniques.	**Food** Prepare ingredients hygienically using appropriate utensils. Measure ingredients to the nearest gram accurately. Follow a recipe. Assemble or cook ingredients.			**Construction** Choose suitable techniques to construct products or to repair items. Strengthen materials using suitable techniques. **Materials** Select appropriate joining techniques.
Knowledge Categories		Technical Knowledge Practical Knowledge Design Process	Technical Knowledge Practical Knowledge Design Inspiration Design Process			Technical Knowledge Practical Knowledge Design Inspiration Design Process
Design, Make, Evaluate, Improve	Design with purpose by identifying opportunities to design. Make products by working efficiently (such as by carefully selecting materials). Refine work and techniques as work progresses, continually evaluating the product design. Use software to design and represent product designs.					

Take inspiration from design throughout History	Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs. Improve upon existing designs, giving reasons for choices. Disassemble products to understand how they work.
Continuous Provision	**Designers** Display a range of designer's work in a variety of areas of study: materials, textiles, electrical and electronics, computing, food – including pioneers in horticulture techniques. 'Designer of the Month.' DT vocabulary to label/ describe their work. **Innovation Area** Improve on existing designs, giving reasons for choices. Provide paper, pencils, photos of designs as stimulus, resources such as levers, winding mechanisms, pulleys and gears. **Devices and Apps** Access a range of devices and apps to explore digital media techniques. **Books** Little People, Big dreams

	Year 4 - DT					
	AUT 1	**AUT 2**	**SPR 1**	**SPR 2**	**SUM 1**	**SUM 2**
Enquiry Question/ Theme		Textiles Seasonal Stocking		Inventions/ Achievements British Inventors		Electrical Systems Light-Up Signs
Milestone Coverage		**Textiles** Join textiles with appropriate stitching. Select the most appropriate techniques to decorate textiles. Understand the need for a seam allowance (in some products eg. identify the seam in own clothing.) **Materials** Cut materials accurately and safely by selecting appropriate tools. Select appropriate joining techniques.		**Take inspiration from design throughout History** Identify some of the great designers, to generate ideas for designs. Improve upon existing designs, giving reasons for choices. **Design, Make, Evaluate, Improve** Design with purpose by identifying opportunities to design. Use software to design and represent product designs.		**Electricals and electronics** Create (series and) parallel circuits. **Materials** Cut materials accurately and safely by selecting appropriate tools. Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut-outs).
Knowledge Categories		Technical Knowledge Practical Knowledge Design Inspiration Design Process		Technical Knowledge Practical Knowledge Design Inspiration Design Process		Technical Knowledge Practical Knowledge Design Process
Design, Make,	Design with purpose by identifying opportunities to design. Make products by working efficiently (such as by carefully selecting materials).					

Evaluate, Improve	Refine work and techniques as work progresses, continually evaluating the product design. Use software to design and represent product designs.
Take inspiration from design throughout History	Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs. Improve upon existing designs, giving reasons for choices. Disassemble products to understand how they work.
Continuous Provision	**Designers** Display a range of designer's work in a variety of areas of study: materials, textiles, electrical and electronics, computing, food – including pioneers in horticulture techniques. 'Designer of the Month.' DT vocabulary to label/ describe their work. **Innovation Area** Improve on existing designs, giving reasons for choices. Provide paper, pencils, photos of designs as stimulus, resources such as levers, winding mechanisms, pulleys and gears. **Devices and Apps** Access a range of devices and apps to explore digital media techniques. **Books** Little People, Big dreams

	Year 5 - DT					
	AUT 1	**AUT 2**	**SPR 1**	**SPR 2**	**SUM 1**	**SUM 2**
Enquiry Question/ Theme		Textiles/ Fashion Drawstring Bags		Cooking/ Nutrition Great British Dishes	Biomimicry Nature inspired innovation	

Milestone Coverage		**Textiles** Create objects that employ a seam allowance. Join textiles with a combination of stitching techniques (eg. back stitch for seams/ running stitch to attach decoration). **Materials** Cut materials with precision Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (eg. the nature of fabric may require sharper scissors than would be used to cut paper).		**Food** Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. Demonstrate a range of baking and cooking techniques. Create and refine recipes, including ingredients, methods, cooking times and temperatures.	**Take inspiration from design throughout History.** Combine elements of design from Biomimicry, giving reasons for choices. Create innovative designs that improve upon existing products. **Design, Evaluate, Improve** Design with the user in mind, motivated by the service a product will offer.	
Knowledge Categories		Technical Knowledge Practical Knowledge Design Inspiration Design Process		Technical Knowledge Practical Knowledge Design Inspiration Design Process	Technical Knowledge Practical Knowledge Design Process	
Design, Make, Evaluate, Improve	Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Ensure products have a high-quality finish, using art skills where appropriate. Use prototypes, cross-sectional diagrams and computer-aided designs to represent designs.					
Take inspiration from design throughout History	Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. Create innovative designs that improve upon existing products. Evaluate the design of products so as to suggest improvements to the user experience.					

Continuous Provision	**Designers** Look at a range of inspirational designers throughout history and use/display DT terminology to describe their work. **Innovation Area** Create innovative designs that improve on existing products, with improvements for users experience. Combine elements of design from a range of inspirational designers throughout history. Provide paper, pencils, photos of products, cross-sectional diagrams and/ or computer aided designs as stimulus. Include questions around current world issues, such as the energy crisis. **Devices and Apps** Access a range of devices and apps to explore digital media techniques. **Books** Little People, Big dreams

	Year 6 - DT					
	AUT 1	**AUT 2**	**SPR 1**	**SPR 2**	**SUM 1**	**SUM 2**
Enquiry Question/ Theme		Electrical systems/ Programming Smart Plant Station		Inventions/ Achievements Programming Pioneers	Cooking/ Nutrition Healthy Burgers	

Milestone Coverage		**Electricals and electronics** Create circuits using electronics kits that employ a number of components (such as LEDs and resistors). Write code to control and monitor models or products. **Materials** Use innovative combinations of electronics (or computing) and mechanics in product designs.		**Take inspiration from design throughout History** Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. **Design, Evaluate, Improve** Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Use computer-aided design to represent designs.	**Food** Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. Demonstrate a range of baking and cooking techniques. Create and refine recipes, including ingredients, methods, cooking times and temperatures. Understand the importance of correct storage of ingredients.	
Knowledge Categories		Technical Knowledge Practical Knowledge Design Inspiration Design Process		Technical Knowledge Practical Knowledge Design Inspiration Design Process	Technical Knowledge Practical Knowledge Design Inspiration Design Process	
Design, Make, Evaluate, Improve	Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). Make products through stages of prototypes, making continual refinements. Ensure products have a high-quality finish, using art skills where appropriate. Use prototypes, cross-sectional diagrams and computer-aided designs to represent designs.					
Take inspiration from design throughout History	Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. Create innovative designs that improve upon existing products. Evaluate the design of products so as to suggest improvements to the user experience.					

Continuous Provision	**Designers** Look at a range of inspirational designers throughout history and use/display DT terminology to describe their work. **Innovation Area** Create innovative designs that improve on existing products, with improvements for users experience. Combine elements of design from a range of inspirational designers throughout history. Provide paper, pencils, photos of products, cross sectional diagrams and/ or computer aided designs as stimulus. Include questions around current world issues, such as the energy crisis. **Devices and Apps** Access a range of devices and apps to explore digital media techniques. **Books** Little People, Big dreams

KS3 Statements	**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. <u>Pupils should be taught to</u> ➢ 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 ➢ understand and apply the principles of nutrition and learn how to cook.