Design and Technology Knowledge and Skills Progression

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

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry)

National Curriculum Area: Design	**Year 3** **Use research and develop design criteria to inform the design of functional, appealing products that are fit for purpose.** **Generate, develop, model and communicate their ideas through discussion, annotated sketches.**	**Year 4** **Use research and develop design criteria to inform the design of functional, appealing products that are fit for purpose.** **Generate, develop, model and communicate their ideas through discussion, annotated sketches, exploding diagrams and computer-aided design**	**Year 5** **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**	**Year 6** **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**
Skills Progression	Use research (e.g. exploring existing products, reading product descriptions) to gain knowledge of a product, its uses and audience Use this knowledge to form a design criteria Use design criteria when designing a functional and appealing product that will work Create designs using annotated sketches, cross-sectional diagrams, computer if appropriate	Use research and knowledge of existing products to develop a design criteria Design a functioning and appealing product for a particular purpose. Create designs using annotated sketches, cross-sectional diagrams, exploding diagrams and simple computer programmes	Use wider research into existing products (e.g. market research) to inform the design of own innovated product Discuss in wider working groups, and respond to discussion, their design ideas Create prototypes, pattern pieces and computer aided design reflecting knowledge of product	Use wider research (e.g work of famous designers or inventors) to inform the design of own innovative product. Generate, develop, model and communicate ideas Choose appropriate means from: discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces & computer-aided design.

National Curriculum Area: Make	**Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]** **Use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties**	**Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]** **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**	**Select from and use a wider range of tools and equipment to perform practical tasks [for example, 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**	**Select from and use a wider range of tools and equipment to perform practical tasks [for example, 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**
Skills Progression	Make suitable choices from a wide range of tools and equipment to perform a practical task with developing accuracy and control Use a wider range of materials (not basic ones) and components to suit / dependant on their functional properties. Assemble and join these appropriately	Make suitable choices from a wide range of tools and equipment to perform a developing level of practical task Use knowledge of materials and components to inform which are needed to make their design Choose materials and components according to their functional and aesthetic qualities (e.g. strength, flexibility, transporting, moving, waterproof, bright)	Apply knowledge of functions of tools and equipment when choosing Use techniques which require more accuracy to cut, shape, join and finish work (eg slots in frames) Accurately choose types, forms and measures of materials for the intended purpose Build more complex 3D structures and apply knowledge of strengthening techniques to make them stronger or more stable	Use technical knowledge and accurate skills to problem solve during the making process Make careful and precise measurements so that joins, holes and openings are in exactly right place Use materials, components and methods accurately and appropriately Use a wide range of methods to strengthen, stiffen and reinforce complete structures / materials, more fluid movement etc

National Curriculum Area: Evaluate	**Investigate a range of existing products** **Evaluate products against their own design criteria** **Understand how key individual / event in design and technology have helped shape the world**	**Investigate and analyse a range of existing products** **Evaluate their ideas and products against their own design criteria** **Understand how key individuals in design and technology have helped shape the world**	**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**	**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**
Skills Progression	Explore and answer simple questions about existing products – audience, materials used, what for Evaluate the product against their own design criteria Find out about how a relevant key individual / event in design and technology helped to shape the world. Begin to understand their impact / contributions.	Ask and answer questions about existing products and their function / purpose Use the investigations to inform or evaluate against their own design criteria Demonstrate understanding of how a relevant key individual / event in design and technology helped to shape the world	Investigate and analyse a range of existing products using previous knowledge and understanding of materials, components and purpose Make reasoned / supported evaluations about their ideas and products in against their own design criteria Through discussion consider the views of others to inform how to improve his/her work Share understanding of how a key event / individual in design and technology helped shape the world	Use own knowledge of famous designs to further explain the effectiveness of existing products Apply own knowledge of materials and techniques, and the views of others, to refine their product to improve its functional properties and aesthetic qualities. Share this in notation / evaluation / reflection Choose and share knowledge and understanding of a key event or individual that has informed their design of a product.

National Curriculum Area: Technical knowledge	**Apply their understanding of how to strengthen, stiffen and reinforce more complex structures** **Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]** **Use electrical systems [for example, series circuits incorporating switches, bulbs, buzzers and motors]**	**Apply their understanding of how to strengthen, stiffen and reinforce more complex structures** **Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]** **Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]** **Apply their understanding of computing to program and control their products**	**Apply their understanding of how to strengthen, stiffen and reinforce more complex structures** **Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]** **Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]** **Apply their understanding of computing to program and control their products**	**Apply their understanding of how to strengthen, stiffen and reinforce more complex structures** **Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]** **Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]** **Apply their understanding of computing to program, monitor and control their products**
Skills Progression	Explore and apply strengthening and reinforcing techniques in more complex structures	Use knowledge of how to strengthen and reinforce more complex structures in their designs Recognise that materials can be combined and mixed to create more useful characteristics.	Apply knowledge of combining materials to create more useful characteristics in their design process	
	Explore and begin to know how mechanical systems such as levers and linkages create movement.	Know how mechanical systems such as levers and linkages create movement.	Use mechanical systems in their products effectively to create movement	Know that a range of mechanical systems e.g. cams, pulleys or gears create movement.
	Begin to know that simple electrical circuits and components can be used to create functional products.	Know that simple electrical circuits and components can be used to create functional products.	Know that mechanical and electrical systems have an input, process and output. Begin to use this knowledge in their product.	Know that simple electrical circuits and components can be used to create functional products. Explore more complex electrical circuits and components.
	Explore computing program and control software.	Use computing program and control software appropriately	Program a computer to control their products (e.g. SCRATCH)	Program computers and devices to monitor changes in the environment and control their products.

National Curriculum Area Cooking and Nutrition	**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.**	**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.**	**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.**	**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.**
Skills and Progression	Talk about the different food groups and name food from each group Explore and research British seasonal fruit and vegetables Use a wider variety of ingredients and techniques to prepare and combine ingredients safely	Understand what makes a healthy and balanced diet, and that different foods and drinks provide different substances the body needs to be healthy and active Understand seasonality and the advantages of eating seasonal and locally produced food Read and follow recipes which involve several processes, skills and techniques	Understand the main food groups and the different nutrients that are important for health Understand how a variety of ingredients are grown, reared, caught and processed to make them safe and palatable/tasty Select appropriate ingredients and use a wide range of techniques to combine them	Confidently plan a series of healthy meals based on the principle of a healthy and varied diet Use information on food labels to inform choices Research, plan, prepare and cook a savoury dish, applying his/her own knowledge of ingredients and his/her technical skills