Curriculum Progression Document Subject: Design and Technology

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.

Key Stage 1

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 and the wider environment].

When designing and making, pupils should be taught to:

Design

- *design purposeful, functional, appealing products for themselves and other users based on design criteria;*
- *generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.*

Make

- *select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing];*
- *select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.*

Evaluate

- *explore and evaluate a range of existing products;*

Key Stage 2

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, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

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 [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.*

Evaluate

- *investigate and analyse a range of existing products;*

• *evaluate their ideas and products against design criteria.* ***Technical knowledge*** • *build structures, exploring how they can be made stronger, stiffer and more stable;* • *explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.* ***Cooking and nutrition*** *As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.* *Pupils should be taught to:* • *use the basic principles of a healthy and varied diet to prepare dishes;* • *understand where food comes from.*	• *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 [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.* ***Cooking and nutrition*** *As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.* *Pupils should be taught to:* • *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.*

Area of Subject		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design 	**National Curriculum Aims / Objectives**	*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.*	*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 and, where appropriate, information and communication technology.*	*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* *To generate, develop, model and communicate their ideas through discussion and annotated sketches*	*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* *To generate, develop, model and communicate their ideas through discussion and computer-aided design*	*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* *To generate, develop, model and communicate their ideas through discussion and cross--sectional prototypes, pattern pieces*	*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* *To generate, develop, model and communicate their ideas through discussion and exploded diagrams; prototypes,*
	Supporting Knowledge & Skills	Think of ideas and with help can put them into practice. Know what a design is and its purpose Use pictures and words to describe what they want to do (materials and tools).		Think of ideas and plan what to do next, based on what I know about materials and components. Plan using specific materials and explain reasons why using those specific materials.		Use own knowledge of design designers and further research to help influence pupils own design. Create models or prototypes to show aspects of my design. Produce step by step plans.	

		Work in a range of relevant contexts, for example imaginary, story-based, home, school and the wider environment.		Use pictures and words to describe what I want to do (materials, techniques, features-mechanics etc. and tools). Select the appropriate tools, techniques and materials explaining my choices. Communicate ideas by using labelled sketches giving reasons for choices. Start to produce step by step plans.		Use computer aided design. Come up with solutions to problems as they happen. Use knowledge of design designers and further research to help influence own design. Create models or prototypes to show aspects of my design. Take part in technical discussions about individual ideas.	
Technical Knowledge 	**National Curriculum Aims / Objectives**	*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.*	*To apply their understanding of how to strengthen, stiffen and reinforce more complex structures.*	*To understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].*	*To understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].*	*To apply their understanding of computing to program, monitor and control their products.*
	Supporting Knowledge & Skills	Design models using simple computering software. Explore how moving objects work.		Combine a number of components well in my product. Make a product that uses both electrical and mechanical components.		Know the application of mechanisms to create movement. Make a product that uses both electrical and mechanical components.	

		Look at wheels, axels, turning mechanisms, hinges and simple levers. Make a product that moves using a turning mechanism (e.g. wheels, winding) or a lever or a hinge (to make a movement)/	Products have a good finish so that a user will find it both useful and attractive. Choose components that can be controlled by switches or by ICT equipment. Product is improved after testing. Use science skills (resistance, batteries in series or parallel, variable resistance to dim lights or control speed) to alter the way electrical products behave. Use simple circuits to either illuminate or create motion. Use precise electrical connections. Use other DT skills to create housings for mechanical components. Understand and demonstrate that mechanical electrical systems have an input, process and output.	Explain how mechanical movements such as levers and linkages can create movement. Choose components that can be controlled by switches or by ICT equipment. Use precise electrical connections. Use other DT skills to create housings for mechanical components. Explored mechanical movement using hydraulics and pneumatics. Understand and demonstrate that mechanical electrical systems have an input, process and output. Use computer-aided design to develop and communicate their ideas. Product(s) are well finished in a way that would appeal to users.
Make 	**National Curriculum Aims / Objectives**	*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*	*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.*	

		ingredients, according to their characteristics.		
	Supporting Knowledge & Skills	Stronger structure- folding, rolling and joining, columns and know what materials can be used for their chosen structure. Know what a join is and can use one. Measure and mark out materials with care and increasing accuracy. Cut materials safely. For example: scissors, junior hacksaw. Be careful to make work look as neat as possible. Find out how to make materials for structure stronger (folding, rolling and joining, columns and triangles) <u>Textiles:</u> Know that textiles have different properties: touch, insulation, texture and waterproof. As a result, select the appropriate textile so that it does the job intended. Describe textiles by the way they feel. Alter a textile to make it stronger.	Use appropriate materials and an appropriate join. Measure and mark out materials with care and increasing accuracy (cm). Use scoring and folding to shape materials accurately. Make cuts accurately (scissors and saws). Make holes accurately (drill, punch). Join materials to make products using both permanent and temporary fastenings. Methods of working are increasingly precise aiming for a high quality finish such as using Art skills to apply texture and design to products. <u>Textiles:</u> Select the appropriate textile(s) for my product. Use sharp scissors accurately to cut textiles. Know that the texture and other properties of materials affect choice.	Select from a variety of materials best suited to the design. Measure using mm and then use scoring, and folding to shape materials accurately. Make cuts accurately and reject pieces that are not accurate and improve technique. Joins are strong and stable, giving extra strength to products. Some joins are flexible to allow for dismantling or folding. Methods of working are precise so that products have a high quality finish. Refine the finish using techniques to improve the appearance of their product, such as sanding or a more precise scissor cut after roughly cutting out a shape. Use computer programming when creating a product <u>Textiles:</u> Products have an awareness of commercial appeal.

		Make a product from textiles. Measure, mark out and cut fabric. Join fabrics using glue and running stitch.	Textile work incorporates the views of intended users' and for the purpose. Use art textiles skills such as stitching to help create a product that is sturdy and fit for purpose. Combine materials to add strength or visual appeal. Textile products include structural changes, such as plaiting or weaving to create new products such as rope, belts, bracelets etc.		Experiment with a range of materials until I find the right mix of affordability, appeal and appropriateness for the job. Combine art skills to add colour and texture to my work. Mark out using patterns and templates. Join textiles using art skills of stitching, embroidering and plaiting to make durable and desirable products.
Evaluate 	**National Curriculum Aims / Objectives**	*To explore and evaluate a range of existing products.* *To evaluate their ideas and products against design criteria.*	*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 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 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.*

	Supporting Knowledge & Skills	Know what a product is. Say what a product is for. Describe a product (who is it for, what is made from, how is it made, how it works). Children to be able to talk about their own work (features, design, and opinion). Know the features of familiar products. Give reasons for some features (colour choice, material used, and joining technique). Talk about their own and others' work (features, design, opinion). Explain why certain materials, techniques and tools were chosen.	Start to research and evaluate existing products. Understand that products are designed for a purpose (e.g. a problem, an audience, an event). Talk about own and others' work (features, design and opinion). Explain why certain materials, techniques and tools have been chosen. Suggest ways in which a product could be improved. Research and evaluate existing products to inform planning. Understand that products are designed for a purpose (e.g. a problem, an audience, an event). Identify what is working well and what can be improved (this is during the make as well as at the end).	Research and evaluate existing products giving reasons for the decisions of the designers (materials, design, tools, techniques). Use the ideas from current designers to help with plans. Reflect on designs and develop them bearing in mind the way they will be used (during the process). Research and evaluate existing products giving reasons for the decisions of the designers (materials, design, tools, techniques). Use the ideas from current designers to help with own plans. Reflect on own designs and develop them bearing in mind the way they will be used (during the process).
Cooking and Nutrition	**National Curriculum Aims / Objectives**	*To use the basic principles of a healthy and varied diet to prepare dishes.* *To understand where food comes from.*	*To understand and apply the principles of a healthy and varied diet.* *To prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.* *To understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.*	

	**Supporting Knowledge & Skills**	*See Cooking Skills Progression Document* *See Cooking Skills Progression Document*