

## Coteford Junior School Progression in Design and Technology

### Essential characteristics of technologists

Significant levels of originality and the willingness to take creative risks to produce innovative ideas and prototypes.

- An excellent attitude to learning and independent working.
- The ability to use time efficiently and work constructively and productively with others.
- The ability to carry out thorough research, show initiative and ask questions to develop an exceptionally detailed knowledge of users' needs.
- The ability to act as responsible designers and makers, working ethically, using finite materials carefully and working safely.
- A thorough knowledge of which tools, equipment and materials to use to make their products.
- The ability to apply mathematical knowledge.
- The ability to manage risks exceptionally well to manufacture products safely and hygienically.
- A passion for the subject and knowledge of, up-to-date technological innovations in materials, products and systems

### Design and Technology Curriculum Map

Unit of work Focus area Curricular Link	Year 3	Year 4	Year 5	Year 6
<b>Autumn Term</b>	<b>Juggling Balls</b> Textiles Art – tie die	<b>Battery Operated Lights</b> Electrical systems Science - Electricity	<b>Moving Toys</b> Mechanisms – Cam History – Victorians Science - Forces	<b>Felt Stockings</b> Textiles Christmas
<b>Spring Term</b>	<b>The Great Bread Bake Off</b> Food RE – Christianity and Judaism	<b>Moving Books</b> Mechanisms Science – Habitats	<b>Programming Adventures</b> Digital World English – story setting	<b>Global Food</b> Food Geography
<b>Summer Term</b>	<b>Let's Go Fly a Kite</b> Construction Outdoor Ed	<b>Seasonal Food</b> Food Science - Growth	<b>Edible Garden</b> Food Café – Smoothies and savoury snack	<b>Structures</b> Bridges / marble run / bird box Construction

**NB** Materials is linked to all the units of work

## **Intent**

Coteford Junior School's Design and Technology scheme of work aims to inspire children to be innovative and creative thinkers who have an appreciation for the product design cycle through ideation, creation and evaluation. We encourage children to develop the confidence to take risks, through drafting design concepts, modelling and testing. Furthermore, we support children to be reflective learners who self-evaluate their work and the work of others. Through our medium term planning we aim to build an awareness of the impact of design and technology on our lives and guide children to become resourceful, enterprising citizens who have the skills to contribute to future design.

Our scheme of work for Design and Technology enables children to meet the end of key stage attainment targets in the National Curriculum and the aims also align with those in the National Curriculum. The progression map for Design and Technology aims to develop a variety of creative and practical activities across KS2. These key Design and Technology skills and concepts are revisited throughout different units of work in a range of relevant contexts such as the home, school, leisure, culture, enterprise, industry and the wider environment to keep children engaged.

## **Implementation**

The Design and Technology National Curriculum outlines the three main stages of the design process: design, make and evaluate. Each stage of the design process is underpinned by technology knowledge which encompasses the contextual, historical and technical understanding required for each strand. Cooking and nutrition has a separate section, with a focus on key specific principles, skills and techniques in food including where food comes from, diet and seasonality.

Our curriculum overview for Design and Technology has a clear progression of skills and knowledge across each year group within the following five strands:

- Design
- Make
- Evaluate
- Technical knowledge
- Cooking and nutrition
- Our progression of skills shows the skills that are taught within each year group and how these skills develop to ensure that attainment targets are securely met by the end of KS2

The key areas which follow the design, make and evaluation process are:

- Cooking and nutrition (food)
- Materials
- Textiles
- Electrical systems
- Digital world
- Construction
- Mechanic

The key areas are revisited with increasing complexity, allowing children to build on their previous learning. Lessons incorporate a range of teaching strategies and differentiated guidance is available to ensure that lessons can be accessed by all children and opportunities to stretch children's' learning are available when required. The revision and introduction of key facts and vocabulary is built into each lesson. Strong subject knowledge is vital for staff to be able to deliver a highly effective and robust Design and technology curriculum. Every effort is made to ensure staff have access to a range of resources to ensure they feel supported to deliver lessons of a high standard. Design and technology is timetabled across the school and integrated with other curriculum areas where possible. Teachers follow a progressive sequence of 8 -12 lessons weekly, depending on the unit of work.

## **Impact**

The impact of the schemes of work can be monitored through both formative and summative assessment opportunities. Each unit of work includes guidance to support teachers in assessing children against the learning objectives. Children at Coteford Junior School should leave school equipped with a range of skills to enable them to succeed in their secondary education and be innovative and resourceful members of society.

The expected impact of following the schemes of work across the school is that children will:

- ✓ Understand the functional and aesthetic properties of a range of materials and resources
- ✓ Understand how to use and combine tools to carry out different processes
- ✓ Build and apply a repertoire of skills, knowledge and understanding to produce high quality outcomes, models and prototypes
- ✓ Understand and apply the principles of healthy eating, diets and recipes
- ✓ Have an appreciation for key individuals, inventions and events that impact our world
- ✓ Self-evaluate and reflect on learning at different stages and identify areas to improve
- ✓ Meet the end of KS2 expectations outlined in the National Curriculum for Design and technology and computing.

Furthermore, impact will be seen in an enriched learning environment will be seen across the school with an increase in the profile of Design and technology. Whole-school and parental engagement will be improved through the use of Design and technology home specific learning tasks and opportunities suggested in lessons and overviews for wider learning. We want to ensure that Design and Technology is loved by teachers and pupils across school, therefore encouraging them to want to continue building on this wealth of skills and understanding, now and in the future. Impact can also be measured through key questioning skills built into lessons, child-led assessment such as success criteria grids, jigsaw targets and KWL grids and summative assessments aimed at targeting next steps in learning.

## Progression Map

### a) Master practical skills

	<b>Pre-KS2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
<b>Food</b>	<p>Cut, peel or grate ingredients safely and hygienically.</p> <p>Measure or weigh using measuring cups or electronic scales.</p> <p>Assemble or cook ingredients.</p>	<p>Prepare ingredients hygienically using appropriate utensils.</p> <p>Measure accurately.</p> <p>Follow a recipe.</p> <p>Assemble or cook ingredients.</p>	<p>Prepare ingredients hygienically using appropriate utensils.</p> <p>Measure ingredients to the nearest gram accurately.</p> <p>Follow a recipe.</p> <p>Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking).</p>	<p>Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms).</p> <p>Demonstrate a range of baking and cooking techniques.</p>	<p>Measure accurately and calculate ratios of ingredients to scale up or down from a recipe.</p> <p>Create and refine recipes, including ingredients, methods, cooking times and temperatures</p>
<b>Materials</b>	<p>Demonstrate a range of cutting and shaping techniques e.g. tearing, cutting, folding and curling.</p> <p>Demonstrate a range of joining techniques e.g. gluing, hinges or combining materials to strengthen</p> <p>Measure and mark out to the nearest cm.</p>	<p>Cut materials accurately and safely by selecting appropriate tools.</p> <p>Select appropriate joining techniques.</p>	<p>Measure and mark out to the nearest mm.</p> <p>Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs).</p>	<p>Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape).</p>	<p>Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (e.g. the nature of fabric may require sharper scissors than would be used to cut paper).</p>

<b>Textiles</b>	<p>Shape textiles using templates.</p> <p>Join textiles using running stitch.</p> <p>Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing).</p>	<p>Understand the need for a seam allowance.</p> <p>Join textiles with appropriate stitching.</p>	<p>Select the most appropriate techniques to decorate textiles.</p>	<p>Create objects (such as a cushion) that employ a seam allowance.</p> <p>Join textiles with a combination of stitching techniques (e.g. back stitch for seams and running stitch to attach decoration).</p>	<p>Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles (such as a soft decoration for comfort on a cushion).</p>
<b>Electricals and electronics</b>	<p>Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage).</p>	<p>Create series circuits.</p>	<p>Create parallel circuits.</p>	<p>Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips).</p>	<p>Create circuits using electronics kits that employ a number of components with increasing confidence.</p>
<b>Computing</b>	<p>Model designs using software.</p>	<p>Control and monitor models using software designed for this purpose.</p>	<p>Control and monitor models using software designed for this purpose.</p>	<p>Write code to control and monitor models or products.</p>	<p>Write code to control and monitor models or products.</p>
<b>Construction</b>	<p>Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products.</p>	<p>Choose suitable techniques to construct products or to repair items.</p>	<p>Strengthen materials using suitable techniques.</p>	<p>Develop a range of practical skills to create products (e.g. cutting, drilling and screwing, nailing, gluing, filling and sanding).</p>	<p>Develop a range of practical skills to create products.</p>

<b>Mechanics</b>	Create products using levers, wheels and winding mechanisms.	Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanism, pulleys and gears).	Use scientific knowledge to choose appropriate mechanisms for a product.	Convert rotary motion to linear using cams.	Use innovative combinations of electronics (or computing) and mechanics in product designs
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**b) Design, make, evaluate and improve**

This concept involves developing the process of design thinking and seeing design as a process.

<b>Pre-KS2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
<p>Design products that have a clear purpose and an intended user.</p> <p>Make products, refining the design as work progresses.</p> <p>Use software to design.</p>	<p>Design with purpose by identifying opportunities to design.</p> <p>Design with purpose by identifying opportunities to design.</p>	<p>Make products by working efficiently (such as by carefully selecting materials).</p> <p>Refine work and techniques as work progresses, continually evaluating the product design.</p> <p>Use software to design and represent product designs.</p>	<p>Design with the user in mind, motivated by the service a product will offer (rather than simply for profit).</p> <p>Make products through stages of prototypes, making continual refinements.</p>	<p>Ensure products have a high quality finish, using art skills where appropriate.</p> <p>Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.</p>

**c) Take inspiration from design throughout history**

This concept involves appreciating the design process that has influenced the products we use in everyday life.

Pre-KS2	Year 3	Year 4	Year 5	Year 6
<p>Explore objects and designs to identify likes and dislikes of the designs.</p> <p>Suggest improvements to existing designs.</p> <p>Explore how products have been created.</p>	<p>Identify some of the great designers in all of the areas of study to generate ideas for designs.</p> <p>Improve upon existing designs, giving reasons for choices.</p> <p>Disassemble products to understand how they work.</p>			<p>Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.</p> <p>Create innovative designs that improve upon existing products.</p> <p>Evaluate the design of products so as to suggest improvements to the user experience.</p>