



Design and Technology at Bomere Heath

Design and Technology is about providing opportunity for children to use creativity and imagination to design and make products that solve real and relevant problems, considering their own and others' needs.

Making mistakes is a part of Design and Technology and integral to learning; our school value of perseverance is taught through this subject.

The National Curriculum

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

At Bomere Heath CE Primary School, it is our intent that Design and Technology is an inspiring, practical, meaningful and memorable 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. Three projects will be taught throughout the academic year. These projects will include one topic per cycle related to food and will ensure that the two strands Design and Making, and Food and Nutrition are delivered effectively. Topics are cross-curricular, where meaningful, and support a broad range of subject knowledge, drawing on disciplines such as mathematics, science, computing and art. Within Design and Technology children will learn and build on a range of practical and technical skills, testing their ideas and critiquing and evaluating both their own products and the work of others. Across all year groups children should be designing and making *Something for Somebody for Some Purpose*. There will also be increased opportunities for computer aided design in the upper school.

Implementation

Our curriculum offers a range of exciting units that solve real and relevant problems. Through these units, we also learn and apply a set of technical skills including structures, mechanisms, electrical control and a range of materials, including food. The children also draw upon knowledge and skills within Maths, Science, computing and Art.

We implement the curriculum through giving the children real and relevant problems to solve, making cross-curricular links to broaden our understanding, offering enrichment opportunities like workshops and competitions and creating real products that serve a purpose.

The children are encouraged to plan, design, make and modify solutions to practical problems in a variety of contexts. This may involve individual, pairs or group work and communicating ideas to others. The design projects involve the pupils working with a range of materials including food, textiles, electrical control, with pulleys and gears.

DT Overview

<u>KS1</u>	Term 1	Term 2	Term 3
Cycle A	Building Structures	Cooking and Nutrition	Mechanisms - Levers and Sliders
Cycle B	Textiles	Cooking and Nutrition	Mechanisms- Wheels and Axles

<u>KS2</u>	Term 1	Term 2	Term 3
Cycle A	Textiles	Electrical Systems	Mechanical Systems (Types of Movement) - Levers and Linkages
Cycle B	Mechanical Systems (Rotary systems) – Cams, gears, pulleys	Cooking and Nutrition	Complex Structures

Teaching Process

Within each term, there also needs to be the inclusion of the following elements within the DT unit being taught:

- **Research / Existing Products**
- **Design**
- **Make**
- **Evaluate**

However, the **context is up to each class teacher** and may be linked to the topic.

This overview above would be the same for each class within the key stage, so that whichever class a child is in, whether they are in the same class for 2 years or not, they have the coverage of all skills within a 2 year cycle.

Each class teacher will then use the DT Progression document to check what the children in their class should be able to achieve within the elements (Design, Make, and Evaluate).

Following the above overview ensures a range of **skills from the national curriculum** across the 2 year cycle for each child.

Each skill **can be moved within the year if needed** to fit in with topics in order to make the art cross curricular, **but not moved to the next cycle.**

	EFS	KS1	LKS2	UKS2
Design	<p>Development matters Return to and build on their previous learning, refining ideas and developing their ability to represent them. (EAD) Create collaboratively, sharing ideas, resources and skills. (EAD)</p>	<p>KS1 Design and Technology National Curriculum 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. 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]. Children design purposeful, functional, appealing products for themselves and other users based on design criteria. They generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. Children can:</p> <ul style="list-style-type: none"> a use their knowledge of existing products and their own experience to help generate their ideas; b design products that have a purpose and are aimed at an intended user; c explain how their products will look and work through talking and simple annotated drawings; d design models using simple computing software; e plan and test ideas using templates and mock-ups; f understand and follow simple design criteria; g work in a range of relevant contexts, for example imaginary, story-based, home, school and the wider environment. 	<p>KS2 Design and Technology National Curriculum 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. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. Children 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. They generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. Children can:</p> <ul style="list-style-type: none"> a identify the design features of their products that will appeal to intended customers; b use their knowledge of a broad range of existing products to help generate their ideas; c design innovative and appealing products that have a clear purpose and are aimed at a specific user; d explain how particular parts of their products work; e use annotated sketches and cross-sectional drawings to develop and communicate their ideas; f when designing, explore different initial ideas before coming up with a final design; g when planning, start to explain their choice of materials and components including function and aesthetics; h test ideas out through using prototypes; i use computer-aided design to develop and communicate their ideas (see note on p. 1); j develop and follow simple design criteria; k work in a broader range of relevant contexts, for example entertainment, the home, school, leisure, food industry and the wider environment. 	<p>KS2 Design and Technology National Curriculum 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. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. Children 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. They generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. Children can:</p> <ul style="list-style-type: none"> a use research to inform and develop detailed design criteria to inform the design of innovative, functional and appealing products that are fit for purpose and aimed at a target market; b use their knowledge of a broad range of existing products to help generate their ideas; c design products that have a clear purpose and indicate the design features of their products that will appeal to the intended user; d explain how particular parts of their products work; e use annotated sketches, cross-sectional drawings and exploded diagrams (possibly including computer-aided design) to develop and communicate their ideas; f generate a range of design ideas and clearly communicate final designs; g consider the availability and costings of resources when planning out designs; h work in a broad range of relevant contexts, for example conservation, the home, school, leisure, culture, enterprise, industry and the wider environment.

Make	<p>Development matters Explore, use and refine a variety of artistic effects to express their ideas and feelings. (EAD) Return to and build on their previous learning, refining ideas and developing their ability to represent them. (EAD) Create collaboratively, sharing ideas, resources and skills. (EAD) ELG Expressive arts and design: Creating with materials Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the process they have used. ELG Physical development: Fine motor Skills Use a range of small tools, including scissors, paintbrushes and cutlery.</p>	<p>KS1 Design and Technology National Curriculum 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 making. Children select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]. They select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Children can: Planning a with support, follow a simple plan or recipe; b begin to select from a range of hand tools and equipment, such as scissors, graters, zesters, safe knives, juicer; c select from a range of materials, textiles and components according to their characteristics; Practical skills and techniques d learn to use hand tools and kitchen equipment safely and appropriately and learn to follow hygiene procedures; e use a range of materials and components, including textiles and food ingredients; f with help, measure and mark out; g cut, shape and score materials with some accuracy; h assemble, join and combine materials, components or ingredients; i demonstrate how to cut, shape and join fabric to make a simple product; j manipulate fabrics in simple ways to create the desired effect; k use a basic running stitch; l cut, peel and grate ingredients, including measuring and weighing ingredients using measuring cups; m begin to use simple finishing techniques to improve the appearance of their product, such as adding simple decorations.</p>	<p>KS2 Design and Technology National Curriculum 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 making. Children select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] accurately. They 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. Children can: Plan a with growing confidence, carefully select from a range of tools and equipment, explaining their choices; b select from a range of materials and components according to their functional properties and aesthetic qualities; c place the main stages of making in a systematic order; Practical skills and techniques d learn to use a range of tools and equipment safely, appropriately and accurately and learn to follow hygiene procedures; e use a wider range of materials and components, including construction materials and kits, textiles and mechanical and electrical components; f with growing independence, measure and mark out to the nearest cm and millimetre; g cut, shape and score materials with some degree of accuracy; h assemble, join and combine material and components with some degree of accuracy; i demonstrate how to measure, cut, shape and join fabric with some accuracy to make a simple product; j join textiles with an appropriate sewing technique;</p>	<p>KS2 Design and Technology National Curriculum 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 making. Children select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately. They 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. Children can: Planning a independently plan by suggesting what to do next; b with growing confidence, select from a wide range of tools and equipment, explaining their choices; c select from a range of materials and components according to their functional properties and aesthetic qualities; d create step-by-step plans as a guide to making; Practical skills and techniques e learn to use a range of tools and equipment safely and appropriately and learn to follow hygiene procedures; f independently take exact measurements and mark out, to within 1 millimetre; g use a full range of materials and components, including construction materials and kits, textiles, and mechanical components; h cut a range of materials with precision and accuracy; i shape and score materials with precision and accuracy; j assemble, join and combine materials and components with accuracy; k demonstrate how to measure, make a seam allowance, tape, pin, cut, shape and join fabric with precision to make a more complex product; l join textiles using a greater variety of stitches, such as backstitch, whip stitch, blanket stitch; m 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.</p>
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			<p>k begin to select and use different and appropriate finishing techniques to improve the appearance of a product such as hemming, tie-dye, fabric paints and digital graphics.</p>	
Evaluate	<p>Development matters Explore, use and refine a variety of artistic effects to express their ideas and feelings. (EAD) ELG Expressive arts and design: Creating with materials Share their creations, explaining the process they have used.</p>	<p>KS1 Design and Technology National Curriculum 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. Children explore and evaluate a range of existing products. They evaluate their ideas and products against design criteria. Children can: a explore and evaluate existing products mainly through discussions, comparisons and simple written evaluations; b explain positives and things to improve for existing products; c explore what materials products are made from; d talk about their design ideas and what they are making; e as they work, start to identify strengths and possible changes they might make to refine their existing design; f evaluate their products and ideas against their simple design criteria; g start to understand that the iterative process sometimes involves repeating different stages of the process.</p>	<p>KS2 Design and Technology National Curriculum 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. Children investigate and analyse a range of existing products. They evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. They understand how key events and individuals in design and technology have helped shape the world. Children can: a explore and evaluate existing products, explaining the purpose of the product and whether it is designed well to meet the intended purpose; b explore what materials/ingredients products are made from and suggest reasons for this; c consider their design criteria as they make progress and are willing to alter their plans, sometimes considering the views of others if this helps them to improve their product; d evaluate their product against their original design criteria; e evaluate the key events, including technological developments, and designs of individuals in design and technology that have helped shape the world.</p>	<p>KS2 Design and Technology National Curriculum 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. Children investigate and analyse a range of existing products. They evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. They understand how key events and individuals in design and technology have helped shape the world. Children can: a complete detailed competitor analysis of other products on the market; b critically evaluate the quality of design, manufacture and fitness for purpose of products as they design and make; c evaluate their ideas and products against the original design criteria, making changes as needed.</p>

Technical Knowledge	<p>Development matters Create collaboratively, sharing ideas, resources and skills. (EAD)</p> <p>ELG Expressive arts and design: Creating with materials Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the process they have used.</p> <p>ELG Physical development: Fine motor Skills Use a range of small tools, including scissors, paintbrushes and cutlery.</p>	<p>KS1 Design and Technology National Curriculum Children build structures, exploring how they can be made stronger, stiffer and more stable.</p> <p>They explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</p> <p>Children can:</p> <ul style="list-style-type: none"> a build simple structures, exploring how they can be made stronger, stiffer and more stable; b talk about and start to understand the simple working characteristics of materials and components; c explore and create products using mechanisms, such as levers, sliders and wheels. 	<p>KS2 Design and Technology National Curriculum Children apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</p> <p>They understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].</p> <p>They understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].</p> <p>They apply their understanding of computing to program, monitor and control their products.</p> <p>Children can:</p> <ul style="list-style-type: none"> a understand that materials have both functional properties and aesthetic qualities; b apply their understanding of how to strengthen, stiffen and reinforce more complex structures in order to create more useful characteristics of products; c understand and demonstrate how mechanical and electrical systems have an input and output process; d make and represent simple electrical circuits, such as a series and parallel, and components to create functional products; e explain how mechanical systems such as levers and linkages create movement; f use mechanical systems in their products. 	<p>KS2 Design and Technology National Curriculum Children apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</p> <p>They understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].</p> <p>They understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].</p> <p>They apply their understanding of computing to program, monitor and control their products.</p> <p>Children can:</p> <ul style="list-style-type: none"> a apply their understanding of how to strengthen, stiffen and reinforce more complex structures in order to create more useful characteristics of products; b understand and demonstrate that mechanical and electrical systems have an input, process and output; c explain how mechanical systems, such as cams, create movement and use mechanical systems in their products; d apply their understanding of computing to program, monitor and control a product.
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Cooking and Nutrition	<p>ELG Expressive arts and design: Creating with materials Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the process they have used.</p> <p>ELG Physical development: Fine motor Skills Use a range of small tools, including scissors, paintbrushes and cutlery.</p>	<p>KS1 Design and Technology National Curriculum Children use the basic principles of a healthy and varied diet to prepare dishes. They understand where food comes from. Children can:</p> <ul style="list-style-type: none"> a explain where in the world different foods originate from; b understand that all food comes from plants or animals; c understand that food has to be farmed, grown elsewhere (e.g. home) or caught; d name and sort foods into the five groups in the Eatwell Guide; e understand that everyone should eat at least five portions of fruit and vegetables every day and start to explain why; f use what they know about the Eatwell Guide to design and prepare dishes. 	<p>KS2 Design and Technology National Curriculum Children understand and apply the principles of a healthy and varied diet. They prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. They understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. Children can:</p> <ul style="list-style-type: none"> a start to know when, where and how food is grown (such as herbs, tomatoes and strawberries) in the UK, Europe and the wider world; b understand how to prepare and cook a variety of predominantly savoury dishes safely and hygienically; c with support, use a heat source to cook ingredients showing awareness of the need to control the temperature of the hob and/or oven; d use a range of techniques such as mashing, whisking, crushing, grating, cutting, kneading and baking; e explain that a healthy diet is made up of a variety and balance of different food and drink, as represented in the Eatwell Guide and be able to apply these principles when planning and cooking dishes; f understand that to be active and healthy, nutritious food and drink are needed to provide energy for the body; g prepare ingredients using appropriate cooking utensils; h measure and weigh ingredients to the nearest gram and millilitre; i start to independently follow a recipe; j start to understand seasonality. 	<p>KS2 Design and Technology National Curriculum Children understand and apply the principles of a healthy and varied diet. They prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. They understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. Children can:</p> <ul style="list-style-type: none"> a know, explain and give examples of food that is grown (such as pears, wheat and potatoes), reared (such as poultry and cattle) and caught (such as fish) in the UK, Europe and the wider world; b understand about seasonality, how this may affect the food availability and plan recipes according to seasonality; c understand that food is processed into ingredients that can be eaten or used in cooking; d demonstrate how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source; e demonstrate how to use a range of cooking techniques, such as griddling, grilling, frying and boiling; f explain that foods contain different substances, such as protein, that are needed for health and be able to apply these principles when planning and preparing dishes; g adapt and refine recipes by adding or substituting one or more ingredients to change the appearance, taste, texture and aroma; h alter methods, cooking times and/or temperatures; i measure accurately and calculate ratios of ingredients to scale up or down from a recipe; j independently follow a recipe.
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During the Early Years Foundation Stage, the essential building blocks of children's design and technology capability are established. There are many opportunities for carrying out D&T-related activities in all areas of learning in the EYFS. Specifically, 'Designing and Making' is identified as a strand within Knowledge and Understanding of the World.

By the end of the EYFS, most children should be able to:

- Construct with a purpose in mind, using a variety of resources
- Use simple tools and techniques competently and appropriately
- Build and construct with a wide range of objects, selecting appropriate resources and adapting their work when necessary
- Select the tools and techniques they need to shape, assemble and join materials they are using