



Brede Primary School

DESIGN AND TECHNOLOGY CURRICULUM

Intent Statement:

Design and technology is an inspiring, rigorous and practical subject. Our intent is to ensure all pupils foster a sense of creativity and imagination as they 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 will acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Through careful planning and collaboration between subject leads we will ensure our DT curriculum is embedded into our topics to deepen understanding and facilitate meaningful learning experiences. Through practical and enquiry-based learning, pupils will 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. Additionally, we have collated a wide range of diverse and inspirational individuals that have had a significant impact within this subject to encourage our learners to pursue further education or careers in design, engineering, or related fields. Our curriculum is designed to be inclusive, providing engaging and challenging experiences for all learners.

Outlined in this document are the **key concepts (Developing Ideas to Master techniques, Acquiring Knowledge and Measuring Impact)** that pupils will explore throughout each topic. Organised into different sub-categories **Design), Make and Evaluate**, we have considered a variety of **skills and key knowledge** that will support children to develop their conceptual understanding and are necessary master this subject. These be taught progressively across every art topic in every year group and revisited regularly to ensure pupils have both the skills and knowledge required.

Additionally, included in this document is a timeline of significant individuals that may be drawn upon throughout our curriculum to ensure we reflect the rich and diverse world around us.

National Curriculum 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.

Age Related Statutory Coverage:

EYFS	Key Stage One Learning	Key Stage Two
ELG: Speaking Children at the expected level of development will:	Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an	Through a variety of creative and practical activities, pupils should be taught the

<ul style="list-style-type: none"> Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary. Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate. <p>ELG: Creating with Materials Children at the expected level of development will:</p> <ul style="list-style-type: none"> 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>iterative process of designing and making working in a range of relevant contexts: Pupils should be taught to:</p> <p>Design</p> <ul style="list-style-type: none"> 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 <p>Make</p> <ul style="list-style-type: none"> Select from and use a range of tools and equipment to perform practical Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics <p>Evaluate</p> <ul style="list-style-type: none"> Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria <p>Technical knowledge</p> <ul style="list-style-type: none"> 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. <p>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</p>	<p>knowledge, understanding and skills needed to engage in an iterative process of designing and making working in a range of relevant contexts: Pupils should be taught to:</p> <p>Design</p> <ul style="list-style-type: none"> 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 <p>Make</p> <ul style="list-style-type: none"> 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 <p>Evaluate</p> <ul style="list-style-type: none"> 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 <p>Technical knowledge</p> <ul style="list-style-type: none"> 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.
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	<p>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:</p> <p>Pupils should be taught to:</p> <p>Cooking & Nutrition</p> <ul style="list-style-type: none"> • Use the basic principles of a healthy and varied diet to prepare dishes • Understand where food comes from 	<p>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:</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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.
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Design and Technology Key Concepts and Skills		
EYFS		
Developing Ideas to Master techniques	Acquiring Knowledge	Measuring Impact
<i>Using creativity and imagination, pupils design and make products.</i>	<i>Acquire a broad range of age appropriate subject knowledge.</i>	<i>Understanding the impact of a product on daily life and the wider world.</i>
Design	<ul style="list-style-type: none"> • Participate in small group, class and one-to-one discussions exploring new products. • Communicate my ideas in a range of different ways e.g. talking and drawing. • Consider what a product would be used for and why. 	
Make using technical Knowledge	Cooking & Nutrition	<ul style="list-style-type: none"> • Know the importance for good health of physical exercise and a healthy diet. • Understand that some foods need to be cooked and some do not. • Handle equipment including knives effectively. • Name a variety of equipment used in a kitchen. • Complete tasks with modelled techniques and follow a simple method to begin to make a product.
	Materials	<ul style="list-style-type: none"> • Name different materials e.g. glue, tape. • To list skills used in DT e.g. gluing, cutting. • Handle equipment including scissors effectively. • Explore different materials and discuss their properties.

	Textiles	<ul style="list-style-type: none"> • Explore a range of fabrics so pupils can explore and experience different textures with their hands. • Use scissors to cut and trim fabric, yarn and string. • Spread glue and stick fabric, yarn and wool on to a chosen surface. • Use fabric creatively with other resources, such as paint or wax crayons. • Use textiles creatively in various activities. • See what happens when different types of fabric get wet.
	Electricals and electronics	<ul style="list-style-type: none"> • Know some items need a battery for power.
	Construction	<ul style="list-style-type: none"> • Use glue and sticky tape. • Construct with a purpose in mind.
	Mechanics	<ul style="list-style-type: none"> • List types of transport.
Evaluate		<ul style="list-style-type: none"> • To say what I like and would improve about my work.

Design and Technology Key Concepts and Skills

KS1

Developing Ideas to Master techniques	Acquiring Knowledge	Measuring Impact
<i>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.</i>	<i>Acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art.</i>	<i>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.</i>
Design	<ul style="list-style-type: none"> • Design purposeful, functional, appealing products based on a design criteria. • Generate, develop, model and communicate ideas through talking, drawing, templates or mock-ups, where appropriate using technology. 	
	Cooking & Nutrition	<ul style="list-style-type: none"> • To assemble ingredients. • Use a knife to cut, peel, grate. • To weigh amounts using cups and scales (using grams). • Understand that food has to be farmed, grown or caught. • Name different food groups. • Understand the importance of five portions of fruit and veg. • Prepare simple dishes without a heat source.

Make using technical Knowledge	Materials	<ul style="list-style-type: none"> • To cut materials safely. • Demonstrate gluing and combining materials to strengthen. • Measure and mark to nearest centimetre. • Demonstrate tearing, folding & curling. • Glue using hinges.
	Textiles	<ul style="list-style-type: none"> • Use weaving to create a pattern. • Learn to plait. • Use dip dye. • Join material using glue or stitching. • Use a template to shape. • Join material using running stitch. • To decorate e.g. add sequins.
	Electricals and electronics	<ul style="list-style-type: none"> • Understand batteries run low and can be damaged. • Generate, develop, model and communicate their ideas through computer-aided design.
	Construction	<ul style="list-style-type: none"> • Use materials to practise drilling, screwing, gluing and nailing to make and strengthen products.
	Mechanics	<ul style="list-style-type: none"> • Learn about levers, wheels and winding mechanisms.
Evaluate		<ul style="list-style-type: none"> • Evaluate work against design criteria. • Identify strengths and possible changes.

Design and Technology Key Concepts and Skills

Lower KS2

Developing Ideas to Master techniques	Acquiring Knowledge	Measuring Impact
<i>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.</i>	<i>Acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art.</i>	<i>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.</i>

Design		<ul style="list-style-type: none"> • 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 and prototypes.
Make using technical Knowledge	Cooking & Nutrition	<ul style="list-style-type: none"> • To follow a recipe. • Assemble and cook using predominantly savoury ingredients controlling oven temperature. • Know that food is grown, reared and caught. • Know about a healthy diet. • Know that to be active and healthy, food and drink is required. • Use chopping, slicing, grating, mixing, spreading, kneading and baking.
	Materials	<ul style="list-style-type: none"> • Measure and mark to nearest millimetre. • Cut and shape using slots. • Select appropriate joining techniques e.g. gluing, hinges or combining materials to strengthen.
	Textiles	<ul style="list-style-type: none"> • Join textiles with stitching. Understand the need for a seam allowance • Create weavings • Dye fabric • Use cross stitch and back stitch.
	Electricals and electronics	<ul style="list-style-type: none"> • Create electrical circuits series and parallel.
	Construction	<ul style="list-style-type: none"> • Choose suitable techniques from drilling, screwing, gluing and nailing to strengthen materials and construct products. • Learn about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.
	Mechanics	<ul style="list-style-type: none"> • Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product e.g. levers, winding mechanisms, pulleys and gears.
Evaluate		<ul style="list-style-type: none"> • Evaluate work against design criteria. • Identify strengths and possible changes. • Evaluate the key designs of individuals in design and technology that have shaped the world.

Design and Technology Key Concepts and Skills

Upper KS2

Developing Ideas to Master techniques

Acquiring Knowledge

Measuring Impact

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.

Acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art.

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.

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 using technical Knowledge

Cooking & Nutrition

- Demonstrate a range of baking and cooking techniques.
- Understand importance of correct storage using knowledge of micro-organisms.
- Demonstrate a range of baking and cooking techniques.
- Use chopping, slicing, grating, mixing, spreading, kneading and baking.
- Understand the importance of nutrients, water and fibre.
- Measure accurately and calculate ratios of ingredients.
- Create and refine recipes.

Materials

- Cut with precision using appropriate tools for material.
- Refine finish by sanding or more precise scissor cutting.

Textiles

- Create pieces choosing from previously learned sewing techniques.
- Quilt pad & gather materials.
- Including seam allowance
- Select material to create visual and tactile effects including decorations

Electricals and electronics

- Create circuits using kits that use a number of components e.g. LED resistors, transistors and chips.
- Apply their understanding of computing to program, monitor and control their products.

Construction

Develop a range of practical skills to create products using:

		<ul style="list-style-type: none"> • Cutting • Drilling • Screwing • Nailing • Gluing • Filing • Sanding
	Mechanics	<ul style="list-style-type: none"> • Convert rotary motion to linear using cams. • Use combinations of electronics and mechanics in product design.
Evaluate		<ul style="list-style-type: none"> • Evaluate work against design criteria. • Evaluate the key designs of individuals in design and technology that have shaped the world.

Key vocabulary:

EYFS	KS1	LKS2	UKS2		
<p>Cooking & Nutrition:</p> <ul style="list-style-type: none"> • Fruit • Vegetables • Safety • Knife • Blade • Tool • Edge • Handle • Chop • Slice • Cut • Saucepan • Blender • Chopping board • Hob • Boil • Blend • Mix • Packaging • Recyclable • Metal • Plastic • Reusable <p>Materials:</p> <ul style="list-style-type: none"> • Join • Stick • Cut • Bend • Slot • Scissors • Measure • Materials • Fix <p>Textiles:</p>	<p>Cooking & Nutrition:</p> <ul style="list-style-type: none"> • Appearance • Balanced • Carbohydrates • Combination • Dairy • Design • Design brief • Diet • Feel • Grate • Grater • Menu • Oils • Prepare • Proteins • Review • Scissors • Smell • Snip • Spread • Spreads • Evaluation <p>Materials:</p> <ul style="list-style-type: none"> • Stable • Stiff • Strong • Structure • Test • Weak • Waterproof <p>Textiles:</p> <ul style="list-style-type: none"> • Accurate • Fabric • Knot • Pouch 	<p>Cooking & Nutrition:</p> <ul style="list-style-type: none"> • Adapt • Addition • Budget • Buttery • Combine • Comment • Construct • Cream • Crunchy • Cuboid • Fold • Hygiene • Layout • Market research • Modify • Multiplication • Opinion • Pounds • Sieve • Sift • Target audience • Texture • Unique • Wooden • spoon <p>Materials:</p> <ul style="list-style-type: none"> • Measure • Mark • Nearest • Millimetres • Cut • Shape • Slots. 	<p>Construction:</p> <ul style="list-style-type: none"> • Aesthetic • Cladding • Design criteria • Evaluation • Frame structure • Function • Inspiration • Reinforce • Stable • Structure • Target audience • Target customer • Texture • Theme <p>Textiles:</p> <ul style="list-style-type: none"> • Aesthetic • Assemble • Design criteria • Evaluation • Fabric • Fastening • Mock-up • Net • Running-stitch • Stencil • Target audience • Target customer • Template <p>Electricals and electronics:</p> <ul style="list-style-type: none"> • Battery 	<p>Cooking & Nutrition:</p> <ul style="list-style-type: none"> • Balance • Bitter • Complement • Cookbook • Farm to fork • Method • Nationality • Reared • Research • Pairing • Preparation • Salty • Sour • Sweet <p>Materials:</p> <ul style="list-style-type: none"> • precision • tools • Refine finish • sanding • scissor cutting <p>Textiles:</p> <ul style="list-style-type: none"> • Accurate • Adapt • Annotate • Design • Design criteria • Detail • Fabric • Fastening • Knot • Properties • Running-stitch • Seam • Sew 	<p>Construction:</p> <ul style="list-style-type: none"> • Mark out • Measure • Model • Research • Right-angle • Set square • Sketch • Strong • Structure • Tenon saw • Natural materials • Plan view <p>Mechanics:</p> <ul style="list-style-type: none"> • Accurate • Assembly-diagram • Axle • Bench hook • Cam • Clamp • Component • Cutting list • Diagram • Exploded-diagram • Finish • Function <p>Electricals and electronics:</p> <ul style="list-style-type: none"> • Assemble • Battery • Battery pack • Bulb • Bulb holder • Buzzer • Circuit • Circuit symbol

<ul style="list-style-type: none"> • Thread • Weave • Pattern • Sew • Sewing needle • Design • Evaluate <p>Electricals and electronics:</p> <ul style="list-style-type: none"> • Batteries • Power • Damaged <p>Construction:</p> <ul style="list-style-type: none"> • Waterproof • Absorb • Prediction • Variable • Experiment • Investigation • Float • Sink • Junk <p>Mechanics:</p> <ul style="list-style-type: none"> • Transport • Cars • Busses • Wheels 	<ul style="list-style-type: none"> • Running-stitch • Sew • Shape • Stencil • Template • Thimble <p>Construction:</p> <ul style="list-style-type: none"> • Function • Man-made • Decorate • Evaluation • Stable • Strong • Test • Weak <p>Mechanics:</p> <ul style="list-style-type: none"> • Axle • Mechanism • Lever • Mechanical • Motion • Pivot • Rotary motion <p>Electricals and electronics:</p> <ul style="list-style-type: none"> • Batteries • Power • Low • Damaged 	<ul style="list-style-type: none"> • Joining techniques • Gluing • Hinges • Combining materials <p>Mechanics:</p> <ul style="list-style-type: none"> • Axle • Ferris wheel • Mechanism • Lever • Linear motion • Linkage • Mechanical • Motion • Oscillating motion • Output • Pivot • Reciprocating motion • Rotary motion • Survey 	<ul style="list-style-type: none"> • Bulb • Buzzer • Cell • Component • Conductor • Copper • Design criteria • Electrical item • Electricity • Electronic item • Function • Insulator • Series circuit • Switch • Test • Torch • Wire 	<ul style="list-style-type: none"> • Shape • Target audience • Target customer • Template • Thread • Unique 	<ul style="list-style-type: none"> • Component • Conductor • Copper • Electrical item • Electricity • Electronic item • Function • Insulator • LED • Test • Torch • User • Wire
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Significant Individuals

Significant inventors and inventions pre 1600's	Significant inventors and inventions 1600's/ 1700's/ 1800's	Significant inventors and inventions 1900's- Now	Significant engineers	Significant Designers	Famous Chefs/ Bakers
<p>849–899 BCE: Anglo-Saxon times: type of candle clock invented by Alfred the Great.</p> <p>400 BCE: The Greek Dionysius the Elder of Syracuse, who was looking to develop a new type of weapon, invented the catapult.</p> <p>1475: First book printed in the English language, Recuyell of the Historyes of Troye, by William Caxton (c. 1422–c. 1491); eighteen copies survive.</p>	<p>1781: The Iron Bridge, the first metal bridge, cast and built by Abraham Darby III (1750–1789).</p> <p>1790: Sewing machine invented by Thomas Saint.</p> <p>1825: Opening of the Stockton and Darlington Railway, the world's first operational steam passenger railway; it was taken over by the North Eastern Railway in 1863.</p> <p>1862: The invention of Plastic by Alexander Parkes (1813-1890)[58]</p> <p>1892: Improved Ironing Board, Invented by Sarah Boone.</p> <p>1887: Automatic Elevator Doors, Invented by Alexander Miles.</p> <p>1881: Carbon Light Bulb Filament, Invented by Lewis Latimer.</p>	<p>1902: Mary Anderson invented windscreen wipers.</p> <p>1903: The Wright Brothers invented the airplane having made the first successful human flight.</p> <p>1923: The Three-Light Traffic Signal, Invented by Garrett Morgan.</p> <p>1940: Refrigerated Trucks, Invented by Frederick McKinley Jones.</p> <p>1964: Electret Microphone, Co-Invented by James E. West.</p> <p>1965: Stephanie Kwolek was an American-Polish chemist who worked with synthetic (humanly-constructed) fibres. She invented Kevlar, an incredibly light but very strong material.</p> <p>1966: Home Security System, Co-Invented by Marie Van Brittan Brown.</p> <p>1974: James Dyson his first invention – the Ballbarrow -</p>	<p>Walter Braithwaite, born in Jamaica, revolutionized engineering at Boeing by developing computer-aided design/computer-aided manufacturing (CAD/CAM) systems.</p> <p>Aerospace engineer Dr. Aprille Ericsson.</p> <p>Dr. Wanda Austin, instrumental not only in shaping the U.S. aerospace industry, but also in ensuring national security within the space community.</p> <p>Isambard Kingdom Brunel He assisted in the building of SS Great Britain, the largest ship of its time which was also the first propeller-driven vessel/ bridges.</p> <p>Henry Ford Through his own experiments, he designed and developed a four-wheel vehicle</p>	<p>(1905–57). French fashion designer Christian Dior dominated world fashion in the decade following World War II.</p> <p>Vivienne Westwood In the 1960's, alongside her husband Malcolm McLaren, she designed clothes with a rock 'n' roll influence which was very shocking to people at the time.</p> <p>Patrick Robinson has contributed to some of the most established and influential fashion brands of all time - Giorgio Armani, Paco Rabanne and Perry Ellis.</p>	<p>Alain Ducasse- One of his signature dishes is the "Capon Magro", a seafood salad first course based on a 16th-century recipe.</p> <p>Gordon Ramsay-He is a British celebrity chef, best known for his high-adrenaline cooking shows.</p> <p>Heston Blumenthal-He is famous for his unusual flavor pairings, such as bacon-and-egg ice cream.</p> <p>Jamie Oliver- He is another UK-based TV celebrity chef. He is famous for trying to encourage healthy eating, with his food philosophy being all about fresh ingredients and farm-to-table cooking at home</p> <p>Mary Berry- British baker, food writer, and television presenter known for her role as a judge on The Great British Bake Off.</p> <p>Julia Child- American chef, author, and television personality who introduced</p>

	<p>Thomas Edison He is famous for the light bulb and the motion picture camera. 1891</p>	<p>replaced the wheel of a wheelbarrow with a ball.</p> <p>Color IBM PC Monitor and Gigahertz Chip, Co-Invented by Mark Dean c. 1980 and 1999</p> <p>Steve Jobs designed the iPod in 2001 to satisfy the demand for music on the move. It was very popular because it was small and stylish.</p> <p>2007: The RepRap Project, the first self-replicating 3D Printer, developed at the University of Bath.</p>	<p>which Edison supported.</p>		<p>French cuisine to the American public.</p>
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