

Mount Primary School
Design Technology
Curriculum Design
Long Term Plan & Progression



Design Technology Intent

At Mount Primary School, we follow the National Curriculum for Design and Technology.

Through the DT curriculum, children become engineers, designers, chefs and architects which enables them to create a range of structures, mechanisms, textiles, electrical systems and food products with a real life purpose. Presenting children with a design brief relating to skills they have learned, allows them to apply these skills, along with technical knowledge, to create functional products. These experiences imitate realistic challenges which may be faced in these career paths. Successfully completing these challenges builds confidence as well as inspiring children to explore careers in technology.

Design Technology Implementation

We teach Design and Technology through investigative and evaluative activities, focus skills tasks and the design, make and evaluate process. Children learn technical knowledge and skills which are then applied to create functional products with specific purposes.

In EYFS, children are beginning to learn knowledge and skills through play which become the foundation for each of the aspects of DT. Through practical activities, F2 children experiment with tools, materials and joining methods as well as familiarising themselves with different types of foods.

Throughout KS1 and KS2, children are learning through a cycle of investigative and evaluative activities, focus tasks and the design, make, evaluate process. Investigative and evaluative activities involve analysing current products to assess whether they are fit for purpose and decide which positive aspects of the products could be used for our own designs.

Focus tasks are short activities specifically designed to allow children to experiment with and practice the skills they will need to complete the construction of their final product.

When pupils arrive at the designing stage of the process, they are able to make informed design decisions considering the knowledge they have acquired from studying current products and practising skills during focus tasks. During the making stage, pupils are able to practically apply what they've learned and evaluate and adapt their designs as they make.

DT is split into 5 aspects; structures, food technology, textiles, mechanisms/mechanical systems and electrical systems. Children complete one project each term covering three of these aspects within a year. Projects are planned to include progression within each aspect so that prior skills and knowledge are built upon and extended.

Design Technology Impact

Teaching using this model has allowed teachers to assess children's understanding throughout each project. Investigative and evaluative activities highlight gaps in knowledge which can be a focus moving forward during the project. Focus Tasks give a clear opportunity for teachers to isolate and assess specific technical knowledge and skills and also allow children to identify their own strengths and weaknesses therefore make more informed design choices.

Children are not afraid to make changes to their designs during their making process and are consequently more comfortable making mistakes before finding solutions. Children are able to confidently reflect on their own finished products and that a finished product does not have to be perfect to show that knowledge has been learned; correctly reflecting on what went wrong and how to fix it also indicates understanding.

Design Technology Long Term Plan							
Key Concepts	Subject Specific Vocabulary	Research & Design	Making & Technical Knowledge				Evaluate
			Structures	Mechanisms	Textiles	Electrical Systems	
	F2	Y1	Y2	Y3/4 A	Y3/4 B	Y5/6 A	Y5/6 B
Autumn	Structures Construction Building and balancing My house models Paper structures-joins	Mechanisms - Sliders and Levers Moving picture book or card	Mechanisms - Wheels and Axles Moving Vehicles	Mechanical systems - Levers and Linkages Robotic arm (grabber)	Food - Healthy and Varied Diet Dips and Dippers	Structures - Frame Structures Playground Equipment	Textiles - Combining different fabric shapes Fabric Christmas decoration
Spring	Food Self-serve snack Cutting and preparing Porridge Fruit Kebab	Structures - Free Standing Structures Bridges	Food - Preparing Fruit and Vegetables Salad	Food - Healthy and Varied Diet Sandwich/wrap	Electrical Systems Motorised vehicle	Food - Celebrating Culture and Seasonality Challa Bread	Mechanical Systems - Pulleys, gears or cams Fairground ride
Summer	Safely exploring tools Outdoor workshop	Food - Preparing fruits and vegetables Fruit salad or Smoothie	Textiles - Templates and joining techniques Puppet	Textiles - 2D shape to 3D product Coin purse with fastening (using traditional fabrics from different countries/cultures)	Structures - Shell Structures Playground equipment	Electrical Systems - Using more complex switches and circuits Motorised vehicle	Food - Celebrating culture and seasonality Cooking for a dietary needs e.g. vegan, food intolerance/allergy

Statutory Coverage

National Curriculum & EYFS	F2	KS1	KS2
	<p>Physical Development: Progress towards a more fluent style of moving, with developing control and grace. Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.</p> <p>Expressive Art and Design: Explore, use and refine a variety of artistic effects to express their ideas and feelings. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills.</p> <p>ELG Physical Development: Use a range of small tools, including scissors, paintbrushes and cutlery.</p> <p>ELG Expressive Art and Design: 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>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</p> <p>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</p> <p>Evaluate Explore and evaluate a range of existing products evaluate their ideas and products against design criteria</p> <p>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.</p>	<p>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</p> <p>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</p> <p>Evaluate 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> <p>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.</p>

Progression Map

Key Concept - Use subject specific vocabulary						
F2	Y1	Y2	Y3/4A	Y3/4B	Y5/6A	Y5/6B
Mechanisms move tools up down roll push Structures build strong join hard weak soft stretchy bendy tall higer Food taste smell sweet hot cold tasty crunchy Textiles soft rough smooth warm thin thick	Mechanisms Push Pull Force Equipment Tools Lever Slider Move Lift Up Down forwards backwards Direction pivot slot bridge/guide join Structures Strong Strength Material Weight Structure Build Assemble Join Attach Stiff Stable Shape Triangle tower frame weak base	Mechanisms Wheel Axle Roll Move Design Model Make Mock-up Test Evaluate Vehicle axle holder chassis body assembling cutting joining finishing fixed free moving mechanism Food Sweet Salty Bitter Sour Savoury Fruit Vegetables Protein Grains Dairy Carbohydrates Textiles Mark out	Mechanisms Purpose Design Design criteria Assemble Linkage Lever Bar Link Pivot Join Measure Centimetres Mechanism Slot Bridge Guide Input Process Output Linear Rotary Food Carbohydrates Protein Dairy Vitamins Minerals Purpose Farming Benefits Grown Caught Reared Home grown Imported Processed Unprocessed Cook	Food Cook Boil Roast Bake Fry Chop Knife Utensil Slice Peel Grate Mix Knead Hazard Safety Burn hygiene Electrical systems Circuit Electrical system Switches Bulb Motor Control Connection Battery Wire insulator conductor crocodile clip system input device output device Structures Shell structure	Structures Strength Shape Material Weak 3D Structure Reinforce frame structure stiffen strengthen reinforce triangulation stability shape join temporary permanent Food Seasonality Weather Growth Production Factories Processed Celebration Religion Cultural Electrical Systems Electrical Components Functional Computer Program Monitor Control series circuit	Textiles Research Limitation Stitches Sew Seam Seam allowance Invisible stitch Overcast stitch Millimetres Mechanical Systems Cams Pulleys Gears Rotation Linear Linkage Grooved Rim Force Lift Movement Rotary Motion Food Recipe Ingredients Nutritional Adapted Taste Texture Aroma Fat Sugar Carbohydrate Protein Vitamins

	top metal wood plastic scissors Food food animal plant vegetable meat eggs fish meal eat cutting safety knife flesh skin seed pip core slicing squeezing healthy diet Ingredients tasting	Template Measure Textiles Material Join Thread Needle Sew Attach Decorate Finish Quality Suitable features	Heat Temperature Texture Taste Flavour sweet sour hot spicy appearance smell preference greasy moist cook fresh savoury hygienic edible frozen tinned seasonal harvested healthy/varied diet Textiles Fastening Joining Shaping Cutting Finishing Appealing Aesthetic Seam Needle Thread Stitch Running stitch Back stitch Pattern piece	2-D (two-dimensional) shape Net Cross-sectional diagram three-dimensional (3-D) shape cube cuboid prism vertex edge face tabs adhesives joining assemble accuracy material stiff strong	parallel circuit input device output device system flowchart	Nutrients Nutrition Healthy varied, gluten dairy allergy intolerance savoury source seasonality
--	---	---	---	--	--	--

Key Concept - Research & Design

F2	Y1	Y2	Y3	Y4	Y5	Y6
<p>Safely experiment with a variety of tools, materials and resources</p> <p>Explore a variety of techniques, experimenting with colour, design, texture, form and function</p> <p>Talk about what they want to make and what materials they will use Talk about why certain materials have been chosen</p>	<p>Work within a range of contexts (e.g. local area)</p> <p>Communicate their own ideas and opinions on existing products through discussion</p> <p>Communicate what product they are making (including who the product is for and how it will work)</p> <p>Use materials, kits and components to explore mock ups and templates</p> <p>Design own product through drawings (with templates to support where necessary)</p> <p>Annotate their designs with basic labels Verbally explain the materials and tools they plan to use and why</p>	<p>Work within a range of contexts (e.g. historical)</p> <p>Communicate their opinions about why they like existing products</p> <p>State what products they are designing and making</p> <p>Design and label own designs with diagrams and words (showing how the criteria has been met)</p> <p>Develop ideas through drawing and talking</p> <p>Explain how the product will function</p> <p>Model ideas using basic prototypes</p> <p>Use ICT where appropriate to develop and communicate ideas</p>	<p>Work confidently within a range of contexts</p> <p>Communicate the strengths and weaknesses of existing products</p> <p>Design a functional product that meets a range of requirements</p> <p>Describe their design using an accurate sketch</p> <p>Create functional models of their product, where applicable</p> <p>Using research, develop realistic design criteria and use them to inform ideas</p> <p>Use discussion to share and clarify ideas</p> <p>With modelling, plan a step-by-step guide which details the order of steps</p>	<p>Communicate how research of existing products will inform their design</p> <p>Design a functional product that meets a range of design requirements (ensuring it is realistic and appropriate)</p> <p>Describe their design using an accurate sketch and explanation</p> <p>Devise a template or prototype to decide the strength and/or reliability of a product</p> <p>Take in to account what another user would want when choosing materials or tools</p> <p>Plan a step-by-step instructional guide and explain it to others</p> <p>Gather information about the needs and wants of individuals</p> <p>Demonstrate creativity when designing products</p>	<p>Communicate the strength and weaknesses of different products in relation to the specification of the task and how this will inform their design</p> <p>After conducting thorough research, create a range of designs through collaborative thinking</p> <p>Describe and analyse a range of designs to create the most effective final design in relation to purpose</p> <p>Create a detailed prototype explain how their plan meets the design criteria</p> <p>Consider the user's opinion and functionality when selecting appropriate materials and tools, justifying their selection</p> <p>Produce a detailed step-by-step plan, which explains why their finished product will be of good quality based on their plan</p> <p>Use a complex IT program to enhance the quality of the product being designed</p>	<p>Conduct market research and other thorough research before planning designs – use this analysis in relation to the specification of the task and how this will inform their design</p> <p>After conducting thorough research, create a range of designs through collaborative thinking exemplifying diversity in designs</p> <p>Work collaboratively to discuss and compromise on ideas</p> <p>Justify own opinions to others when creating a final design from different views and cross-sections</p> <p>Use a prototype of template to check if their design will be successful and adapt it where necessary</p> <p>Work within constraints (e.g. timing, budget) when selecting materials and tools, justifying their selection</p> <p>Produce a detailed step-by-step plan, which explains why their finished product will be of good quality (with consideration to audience, purpose, culture and society)</p>

Key Concept - Making & Technical Knowledge - Structures

F2	Y1	Y2	Y3/4A	Y3/4B	Y5/6A	Y5/6B
<p>-Use equipment and resources safely</p> <p>-Name and use simple tools, materials, and resources</p> <p>-Name and use different ways of joining and attaching in their work (such as various types of glue, tape, string etc. – and select them appropriately</p> <p>-Use simple language to describe the properties of materials such as ‘hard’, ‘strong’, ‘bendy’, ‘stretchy’</p>	<p>- Assemble, join and combine materials and components to create a stable structure</p> <p>-Join materials and components in different ways</p>			<p>- Make and assemble a model -Measure materials to use in a model or structure</p> <p>-Join materials and components in different ways</p> <p>-Construct 3D geometric shapes using nets</p> <p>-Create special features for individual designs</p> <p>-Measure, mark, cut out and shape components with some accuracy</p>	<p>-Demonstrate resourcefulness when tackling practical problems</p> <p>-Independently measure and mark wood accurately to build a wooden bridge structure</p> <p>-Demonstrate correct techniques when use a saw Identify where a structure needs reinforcement and use card corners for support</p> <p>-Understand basic wood function properties</p> <p>-Draw upon new and prior knowledge of structures</p> <p>-Accurately construct a 3D model</p> <p>-Draw upon new and prior knowledge to reinforce the final structure, justifying choices</p>	

Key Concept - Making & Technical Knowledge - Mechanisms

F2	Y1	Y2	Y3/4A	Y3/4B	Y5/6A	Y5/6B
<ul style="list-style-type: none"> - Use ramps to observe and discuss movement of vehicles -Use simple vocabulary such as 'roll', 'down', 'wheels', 'move' and 'push' when discussing the movement of the vehicle -Experiment with moving vehicles on different surfaces -To observe moving toys with levers and pulleys such as diggers and cranes 	<ul style="list-style-type: none"> -Cut and shape card -Assemble, join and combine simple components -Create a simple moving model that uses a lever and slider -Use split pins for pivots -Use finishing techniques (including those from art and design) 	<ul style="list-style-type: none"> -Measure, mark and cut materials and components -Experiment with adjusting elements of design (e.g. length of string) -Assemble wheels, axles and brackets correctly to enable rotating movement -Choose appropriate joining techniques when assembling vehicle -Use finishing techniques (including those from art and design) 	<ul style="list-style-type: none"> -Measure, mark and cut materials and components -Use a series of levers and linkages to create a robotic arm -Use split pins for fixed and loose pivots -Select materials due to their functional and aesthetic characteristics -Create a range of mechanical levers to create movement -Apply a range of finishing techniques (including those from art and design), with some accuracy 			<ul style="list-style-type: none"> - Make informed design decisions between, lever, gear or pulley for fairground ride design. -Measure, mark and cut materials and components -Use appropriate and considered joining techniques for fairground ride -Problem solve/ adapt designs throughout assembly process -Make an effective moving fairground ride -Apply a range of finishing techniques (including those from art and design), with accuracy

Key Concept - Making & Technical Knowledge - Textiles

F2	Y1	Y2	Y3/4A	Y3/4B	Y5/6A	Y5/6B
<p>-Discuss different textures and colours of materials</p> <p>-Begin to operate fastenings independently in everyday situation e.g. velcro their shoes, zip their coat etc</p> <p>-Explore appropriateness of materials for different situations e.g. a fluffy coat in the winter, soft filling for a teddy bear</p>		<p>- Cut and join fabric working towards accuracy</p> <p>-Make and test a paper template with some accuracy and in keeping with the design criteria</p> <p>-Measure, mark and cut out fabric using a paper template</p> <p>-Select a stitch to join fabric, working to sew neat stitches</p>	<p>- Cut and join fabric with some accuracy</p> <p>-Make and test a paper template/ pattern piece accurately and in keeping with the design criteria</p> <p>-Measure, mark and cut out fabric using a paper template</p> <p>-Select a stitch to join fabric, working to sew neat stitches</p> <p>-Select a fastening for coin purse</p> <p>-Attach fastening to coin purse using sewing stitch</p>			<p>- Cut and join fabric with accuracy</p> <p>-Make a template using CAD (Microsoft Word)</p> <p>-Test template accurately and in keeping with the design criteria</p> <p>-Measure, mark and cut out fabric using a paper template</p> <p>-Select a stitch to join fabric, using sew neat stitches</p>

Key Concept - Making & Technical Knowledge – Electrical Systems

F2	Y1	Y2	Y3/4A	Y3/4B	Y5/6A	Y5/6B
<p>-Recognise that electrical systems can be turned on with a switch e.g. light switches, toys, phones, computers</p> <p>-Be aware of basic electrical safety e.g. do not touch plugs</p>				<p>-Make a working electrical circuit including a motor, switch and lights</p> <p>- Attach a working circuit to a moving vehicle to enable powered movement.</p>	<p>-Programme a crumble circuit board to control motor within a circuit</p> <p>-Programme a crumble circuit board to control lights within a circuit</p> <p>- Attach a working Crumble- programmed circuit to a moving vehicle to enable powered movement and lights.</p>	

Key Concept - Making & Technical Knowledge – Cooking & Nutrition

F2	Y1	Y2	Y3/4A	Y3/4B	Y5/6A	Y5/6B
<p>-Begin to develop a food vocabulary, using simple language to describe the properties of food such as 'sweet', 'tasty', 'crunchy', 'hot'</p> <p>-Begin to think about and explore different types of food</p> <p>-Introduction to healthy food and diet</p> <p>-Opportunities to prepare and choose healthy snacks</p> <p>-Use correct hand hygiene before eating or participating in group cooking</p>	<p>-Follow health and hygiene procedures</p> <p>-Chop fruit safely under adult supervision</p> <p>-Use a range of healthy ingredients (fruit)</p> <p>-Combine ingredients for fruit smoothie</p>	<p>-Follow health and hygiene procedures</p> <p>-Use a range of healthy ingredients (vegetables)</p> <p>-Chop vegetables safely keeping fingers away from blade and chopping on a board</p> <p>-Make choices for salad based on sensory preferences</p>	<p>-Use a range of food ingredients</p> <p>-Explain their ingredient choices in relation to original design criteria</p> <p>-Measure ingredients using recipe with some accuracy</p> <p>-Follow the instructions of a recipe</p> <p>-Demonstrate that they have taken care and given consideration to the appearance of their product</p>	<p>-Follow a recipe using multiple steps (with support)</p> <p>-Measure ingredients with some accuracy</p> <p>-Chop ingredients safely keeping fingers away from blade and chopping on a board</p> <p>-Grate ingredients safely keeping fingers away from blade and chopping on a board</p> <p>-Combine ingredients safely, following basic hygiene rules</p> <p>-Adapt a recipe</p>	<p>-Prepare food safely and hygienically to avoid cross-contamination</p> <p>-Accurately measure out ingredients</p> <p>-Follow a multi-step recipe independently</p> <p>-Select ingredients based on sensory preferences</p> <p>- Use correct kneading and plaiting techniques to make Challa bread</p>	<p>-Follow a recipe, including using the correct quantity of each ingredient</p> <p>-Adapt a recipe based on research of dietary needs/allergies</p> <p>-Work to a given timescale</p> <p>-Use all cooking equipment safely and with precision</p> <p>-Prepare food safely and hygienically to avoid cross-contamination</p>

Key Concept - Evaluate

F2	Y1	Y2	Y3/4A	Y3/4B	Y5/6A	Y5/6B
<p>-Adapt their work and techniques where necessary</p> <p>-Discuss what they have made and what worked well</p> <p>-Talk about what they could do differently next time</p> <p>-Share their creations and discuss the processes they have used</p> <p>-Return to and build on their previous learning, refining ideas and developing their ability to represent them</p>	<p>-Talk about their design and what they are making</p> <p>-Make some simple judgements about their product and ideas (what they like, how it could be made better)</p> <p>-Explore existing products (talk about how they work and what they are used for)</p>	<p>-Suggest strengths and weaknesses of different existing products</p> <p>-Make simple judgements, in more detail than Y1, how their finished product relates to the original design criteria</p> <p>-Suggest basic changes to improve their products during the process</p>	<p>-Acknowledge where and when products were made</p> <p>-Explore how well products have been made and why specific materials have been chosen</p> <p>-Make decisions to change plan and/or design throughout the making process</p> <p>-Explain what they have changed to make improvements to final product</p> <p>-Explain how current product are fit for purpose</p>	<p>-Identify the strengths and areas of development in their ideas and products</p> <p>-Use the original design criteria to evaluate completed product</p> <p>-Evaluate product thinking of both appearance and mechanisms during the process</p> <p>-Explain how some current products are fit for purpose and some are not.</p> <p>-Explain whether their finished product is fit for purpose</p>	<p>-Ensure that the evaluation of their product's effectiveness is ongoing throughout the designing and making process</p> <p>-Consistently check whether anything can be improved before going ahead with it</p> <p>-Seek advice to refine and improve the final product</p> <p>-Evaluate the quality of design, manufacture and fitness for purpose of their products as they design and make</p> <p>-Evaluate the function and appearance against the original criteria</p>	<p>-Generate discussions with peers and decide whether the product is fit for purpose (during each stage of the process)</p> <p>-Evaluate their ideas and products against the original design specification</p> <p>-Investigate and analyse how much products cost</p> <p>-Discuss a range of elements that could improve their product (including alternative resources, budget and technology)</p> <p>-Offer constructive evaluation to others to</p>