

Design and Technology Education

At Normanby Primary School, Design and Technology (DT) forms an important part of the curriculum. It is a practical and inspiring subject that promotes self-reflection, resilience and independence within our children across all year groups. It provides a multitude of opportunities for our young people to design and make products that solve real-life problems within a variety of contexts by using the skills that they learn and build upon throughout their educational journey. Most importantly, these open-ended projects celebrate innovation and imagination; and encourage children to be bold, to be brave and to take risks.

Foundation Stage		
	FS1	FS2
Creating with materials	<p>Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park. Provide lots of flexible and open-ended resources for children's imaginative play.</p> <p>Explore different materials freely, to develop their ideas about how to use them and what to make. Develop their own ideas and then decide which materials to use to express them.</p> <p>Join different materials and explore different textures. Offer opportunities to explore scale using long strips of wallpaper, child size boxes and different surfaces to work on e.g, paving, floor, table or easel. Use glue and masking tape for sticking pieces of scrap materials onto old cardboard boxes, hammers and nails, glue guns, paperclips and fasteners.</p>	<p>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>Provide opportunities to work together to develop and realise creative ideas. Provide children with a range of materials for children to construct with. Encourage them to think about and discuss what they want to make Discuss problems and how they might be solved as they arise. Reflect with children on how they have achieved their aims. Teach children different techniques for joining materials, such as how to use adhesive tape and different sorts of glue. Provide a range of materials and tools and teach children to use them with care and precision and independence.</p>

Early Learning Goal: 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.

Year Group	Year 1 Theme 1	Year 1 Theme 2	Year 1 Theme 3
Learning Theme	Cooking and Nutrition: Hedgehog Dip	Peg Dolls Cooking and Nutrition: Marmalade Sandwiches	Design and construction: Houses for the Three Pigs
Substantive Knowledge	<ul style="list-style-type: none"> • Food comes from either plants, like apples, or animals, like milk and eggs. • The Eatwell Plate shows food groups like fruit, vegetables, dairy, proteins, and carbohydrates for a balanced diet. • Fruits and vegetables like carrots, cucumbers, apples, and peppers are suitable for making dips. • Fruits grow on plants, and animal products come from sources like cows, chickens, or fish. • Designs should consider how a product looks (appearance) and how it works (function). • Fruit and vegetables can be safely prepared by washing, peeling, and cutting, without using heat. • Tools like peelers and knives have specific purposes to help prepare food safely and accurately. • A successful product is one that works well, looks good, and meets the needs of the user. • Designs can be improved by changing features like shape, material, or function based on testing and feedback. 	<ul style="list-style-type: none"> • Sandwiches can be savoury or sweet; Paddington eats marmalade ones • Food items can be designed and described before being made • Spreading and cutting as basic food preparation skills • Evaluating helps improve future design and making • Victorian children made their own toys like peg dolls • Finished products can be discussed and evaluated for improvement 	<ul style="list-style-type: none"> • Houses are made from different materials with different properties (e.g. bricks = strong). • The purpose of a structure influences material choice. • Stronger materials are more suitable for building. • Folding, overlapping, and joining materials makes structures stronger. • Tape and glue have different joining properties. • Evaluating a product helps improve future work. Know that different materials and joining methods affect strength.
Disciplinary Knowledge	<ul style="list-style-type: none"> • Practise using tools safely (e.g. knife for cutting). • Draw from real experiences with food. • Generate ideas collaboratively. • Create and sequence visual instructions. • Explain their own ideas and suggest improvements. • Follow a design plan. • Work hygienically (wash hands, handle food safely). • Use cutting and assembling techniques. • Talk about what worked well. • Identify what they could do differently. • Suggest alternative ideas (e.g. could we make another animal?). 	<ul style="list-style-type: none"> • Talk about design preferences; compare tastes and textures • Plan a design and write instructions; communicate clearly • Follow steps in order, use tools with guidance, work safely • Use sensory vocabulary to reflect on a finished product • Observe and comment on materials and designs in real artefacts • Label key features; suggest tools and methods • Select tools/materials; assemble using joining techniques • Reflect on strengths and areas to improve; express opinions 	<ul style="list-style-type: none"> • Discuss different materials used in real-life homes. • Use vocabulary to describe and compare buildings. • Ask and answer questions about strength and materials. • Talk about ideas clearly. • Create a labelled drawing or list of materials. • Plan with a purpose in mind. • Cut, fold, glue, and tape materials with help. • Assemble materials to match design. • Use scissors and glue safely. • Reflect on their work verbally. Identify what went well and what was tricky. • Make suggestions for how to improve.

Year Group	Year 2 Theme 1	Year 2 Theme 2	Year 2 Theme 3
Learning Theme	Construction: Great Fire of London Houses	Textiles: Antarctic Animal Puppets	Cooking and Nutrition Hawaiian Fruit Salad
Substantive Knowledge	<ul style="list-style-type: none"> Houses in 1666 were built with wood and tightly packed together and that structures were narrow and leaned over streets. Tudor-style houses were narrow and overhanging. Buildings can be made stronger by adding internal support and selecting appropriate materials. Techniques (cutting, folding, joining) help make structures more stable and realistic. 	<ul style="list-style-type: none"> Puppets can be used for storytelling or play Antarctic animals have distinct features. Materials like felt are used in puppet-making. Fabric can be joined with glue, staples, or stitches. Running stitch is a basic hand sewing technique. Templates guide cutting. Decoration includes eyes, flippers, beaks, etc. Safety when using tools is important. Evaluation improves work. Comparing design and product shows success. 	<ul style="list-style-type: none"> Traditional Hawaiian dishes often include fruit, fish, and vegetables The Eatwell plate shows 5 food groups Hawaii grows tropical fruits like pineapple, papaya, mango Simple tools (e.g. knife, board) are needed to make a fruit salad Bridge and claw grips are used for safe cutting Dishes must be prepared safely and hygienically Evaluation involves comparing the end product to the design Reflection can help improve skills and planning
Disciplinary Knowledge	<ul style="list-style-type: none"> Observe historical house structures. Discuss and explain ideas. Begin to compare old vs modern homes. Draw and label their house design. Begin to write and follow simple design criteria. Select materials and tools for purpose. Measure, cut and score with some accuracy. Join using glue or tape. Begin to use tools safely (scissors, rulers, glue sticks). Discuss strengths and weaknesses. Suggest changes or improvements. Compare final product with original design. 	<ul style="list-style-type: none"> Observe and analyse existing products. Create a labelled design for a puppet. Make material and design choices. Practise different joining techniques. Use a running stitch on fabric. Select appropriate joining method. Cut and assemble accurately. Join using chosen method. Apply decorations and finishing touches. Reflect on design choices and outcomes. Evaluate strengths and improvements. 	<ul style="list-style-type: none"> Categorising ingredients Labelling food groups Observation and discussion skills Writing a simple design Listing tools and equipment Describing cutting methods Using child-safe knives appropriately Following instructions accurately Creating a final product based on a plan Evaluating taste and appearance Identifying changes for next time Reflecting on skills used

Year Group	Year 3 Theme 1	Year 3 Theme 2	Year 3 Theme 3
Learning Theme	<u>Cooking & Nutrition</u> – Eat Well Plate, Australian Salad	<u>Design/Make/Evaluate</u> – Shelter	<u>Design/Make/Evaluate</u> – Catapult (Trebuchet)
Substantive Knowledge	<ul style="list-style-type: none"> • A healthy diet includes a balance of food groups shown on the Eatwell Plate, supporting varied and nutritious eating. • Food reflects cultural traditions; different cultures use specific ingredients, flavours, and cooking methods. • Food provides energy, nutrients, and supports growth; different types of food have different health benefits. • Safe techniques like handwashing and using clean equipment help ensure food is cooked hygienically and safely. • Australian diets include traditional Indigenous foods and recipes from migrant communities, showing cultural diversity. • Evaluating meals helps improve cooking by identifying what worked well and what could be changed next time. 	<ul style="list-style-type: none"> • Shelters protect people from weather and danger and provide comfort; they differ across times, cultures, and climates. • Effective shelters solve problems like wind or rain by being waterproof, windproof, or well-insulated. • Design criteria help ensure a product meets its purpose and performs as needed. • Strong, weather-resistant materials are chosen for shelters based on properties like strength, flexibility, and durability. • Planning helps organise tasks, avoid mistakes, and complete design projects more efficiently. • Using the correct tools and materials ensures a product is made safely, accurately, and to a good standard. • Materials can be joined using glue, tape, tabs, and folds; strong structure depends on good joining techniques. • Mistakes in design are normal and help improve the final product through learning and problem-solving. • Finishing techniques like painting, trimming, or smoothing improve a product’s appearance and structure. • Reinforcement strengthens structures and helps them last longer by making them more stable and durable. • Products are evaluated on how well they meet the original purpose and design criteria. 	<ul style="list-style-type: none"> • Catapults have been used throughout history, e.g., Mangonel and Trebuchet, and that catapults are designed for launching projectiles. • Catapults need to meet specific criteria (e.g., power, accuracy). • Different materials have specific properties (e.g., strength, flexibility). • A step-by-step plan helps ensure accuracy in making. • There are a range of joining methods including gluing, tying, or using tabs. • Evaluation involves reflecting on the design, function, and effectiveness.
Disciplinary Knowledge	<ul style="list-style-type: none"> • Sort and classify foods into correct groups. • Recognise food origins. • Use food knowledge to match needs and energy levels. • Follow instructions accurately. • Practise consistent chopping methods. Practise safe food preparation (bridge and claw methods) • Reflect and compare outcomes. • Evaluate own cooking against a design plan. • Reflect on improvements. 	<ul style="list-style-type: none"> • Work collaboratively to create a design criteria and describe purpose clearly. • Label drawings with materials and features. • Produce a written, step-by-step plan for making. • Estimate quantities and list tools. • Practise safe use of scissors, hole punches, split pins, etc. • Explore and test joining methods. • Evaluate success using a scaffolded form and compare to original design. 	<ul style="list-style-type: none"> • Research different catapults (e.g., Mangonel, Trebuchet) and describe their functionality and key parts. • Collaboratively create a design criteria for success. • Use design criteria to create and label a detailed design. • Choose appropriate materials based on functionality. • Create a step-by-step written plan including materials and tools needed for making. • Use safety measures when cutting and joining materials. • Practise making small joints to understand their strength. • Evaluate the design during construction to make improvements. • Evaluate whether the catapult meets the design criteria. • Suggest improvements based on the test results.

Year Group	Year 4 Theme 1	Year 4 Theme 2	Year 4 Theme 3
Learning Theme	Cooking and Nutrition	Textiles: Money Containers	Design/Construction: Bridges
Substantive Knowledge	<ul style="list-style-type: none"> The Eat Well Plate contains five food groups. Each food group plays a role in a healthy diet. Food comes from plants and animals in the UK and around the world. Certain foods are seasonal. Savoury dishes can be made with ingredients from each food group. Cooking techniques help with taste and texture. Evaluation improves final products. Testing and feedback help refine work. 	<ul style="list-style-type: none"> Modern money containers have different materials, fastenings, and sizes. Common materials used for modern purses (e.g., leather, fabric). Stitches used in historical sewing (running, back, over stitch). Differences between stitches and their uses. Anglo-Saxon purses were simple, often made of leather or fabric. Fastenings for purses might include buttons, zips, or buckles. Clear plans and steps are needed for successful making. The correct use of materials and tools is important for a functional product. The process of joining fabric through stitching. The importance of using appropriate stitching techniques for strength and durability. Evaluate the final product to identify what worked and areas to improve. Testing the functionality of the purse. 	<ul style="list-style-type: none"> Beam, Arch, Suspension, Cantilever bridges are types of bridges. Purpose, strengths, and key components of bridges. Bridges must meet different needs (height, strength, function). - Historical and modern bridge examples. Bridge structures must be strong and allow for transport and clearance. Materials affect structure. Bridge features (span, load-bearing parts, clearance). Stability and strength are affected by how materials are joined. Structures must support load and maintain shape. Product evaluation compares outcome to brief.
Disciplinary Knowledge	<ul style="list-style-type: none"> Label and categorise foods correctly. Justify food choices in meal planning. Identify food origins (grown, reared, caught). Analyse dishes for their ingredients and sources. Use tools and techniques safely (peeling, grating, chopping, kneading, baking). Follow a step-by-step recipe. Record evaluations with evidence. Use annotated photos and peer feedback to reflect. 	<ul style="list-style-type: none"> Investigate existing products and evaluate their features. Use observations and research to inform the design process. Understand the different types of stitches. Reflect on which techniques are best for different projects. Use the findings from the previous lessons to design a product that is both functional and appealing. Justify choices of materials and tools. Develop a step-by-step plan, ensuring materials and tools are listed. Think critically about the creation process and potential problems. Use stitching techniques accurately. Ensure that materials are joined securely and fastenings are applied correctly. Evaluate the final product against the original design criteria. Suggest improvements based on the outcome. 	<ul style="list-style-type: none"> Ask questions to guide research. Use drawings and note-taking to record findings. Organise and present research using digital tools (Book Creator/Keynote). Generate and refine ideas based on function. Communicate thinking through annotated drawings. Create labelled diagrams showing multiple views. Justify design decisions. Use cutting, joining, reinforcing, and combining techniques. Test and adapt construction. Evaluate against design criteria. Consider testing results and suggest improvements.

Year Group	Year 5 Theme 1	Year 5 Theme 2	
Learning Theme	Cooking and Nutrition – Prepare and Cook a Savoury Dish	Design/Make/Evaluate: Moon Buggies	
Substantive Knowledge	<ul style="list-style-type: none"> • Ancient Greeks used seasonal, local produce (e.g. olives, grains, cheese, herbs). • Seasonal changes affect food growth and harvest. • Different foods contain nutrients (e.g. calcium in cheese, fibre in vegetables). • Healthy meals combine a balance of food types. • Food preparation includes steps like kneading, mixing, slicing, baking. • Safe hygiene practices prevent illness. Know that some foods must be cooked before eating. 	<ul style="list-style-type: none"> • Moon buggies are vehicles designed to transport astronauts and equipment across the Moon’s surface. • Real moon buggies use strong, lightweight materials and have features like large wheels and protective frames. • A design brief and criteria are based on research to guide the purpose, materials, and features of a product. • Triangulated shapes strengthen structures by distributing weight and adding stability to frames and models. 	
Disciplinary Knowledge	<ul style="list-style-type: none"> • Research and interpret historical sources. • Compare historical and modern diets. • Sort foods by season or origin. • Use knowledge of food groups to design a balanced meal. • List required equipment and steps in a recipe plan. • Follow instructions and handle tools safely. • Apply appropriate cooking methods (grate, knead, bake). • Adapt if ingredients or tools differ. • Reflect critically on personal and peer products. • Annotate product photos or tasting notes. 	<ul style="list-style-type: none"> • Research and select key facts from various sources. • Record findings effectively using labelled diagrams or notes. • Translate research into a clear, achievable design. • Use diagrams to communicate ideas. • Create a functional design brief. • Measure and cut with accuracy. • Follow a step-by-step plan. • Adapt design when needed. • Use appropriate tools and techniques. • Evaluate using the original design criteria, recording findings and presenting product confidently and clearly. 	

Year Group	Year 6 Theme 1	Year 6 Theme 2	
Learning Theme	Research/Design/Make/Evaluate: Anderson Shelters	Research/Design/Make/Evaluate: Fairground Rides	
Substantive Knowledge	<ul style="list-style-type: none"> • Anderson shelters were built during WWII for air raid protection. • Anderson Shelter key features: corrugated metal, curved arch, partially buried for safety. • Different materials have different properties (strength, durability, flexibility). • Design criteria helps guide a functional and purposeful structure • Effective shelters require sturdy construction and accurate use of tools. 	<ul style="list-style-type: none"> • Fairground rides are built for entertainment and use different motions like spinning, swinging, or lifting to move passengers. • Fairground rides have key design features such as strong frames, safety barriers, moving parts, and decorative elements. • Design criteria are developed through research to guide the function, safety, and appearance of a fairground ride model. • Pulleys, gears, and belt drives transfer motion and control speed or direction in mechanical systems. • Motion is transferred in rides through systems like gears, belts, or motors to make parts move. • Electrical circuits need components like batteries, wires, and bulbs connected correctly for a device to function. • Circuit diagrams use symbols to show how electrical components are connected in a working system. • Functional circuits are built by connecting components properly, so electricity flows and powers devices. • Adding more cells to a circuit increases the voltage and power, making devices work more strongly or brightly. 	
Disciplinary Knowledge	<ul style="list-style-type: none"> • Record research using appropriate sources. • Identify purpose and materials of real-world designs. • Conduct simple comparative tests for material strength. • Record results accurately. • Use evidence to inform design choices. • Draw labelled diagrams and write design specifications. • Apply construction skills using tools and materials safely. • Work collaboratively. • Compare model to original design. • Suggest clear improvements based on performance. 	<ul style="list-style-type: none"> • Research and analyse existing products, recording and findings • Develop and justify design decisions • Build and test working pulley and gear systems • Record labelled diagrams explaining systems used • Create detailed annotated diagrams • Plan materials, steps, and methods • Anticipate challenges • Follow plan to construct ride • Use tools and materials safely • Collaborate and solve problems during construction • Compare final product to criteria: Identify successful elements and areas to improve 	