

# D&T long-term knowledge growth

## Rationale for content sequencing



Year N	Substantive D&T content	Recurring themes, ideas and language	
	<p>In Nursery, children develop early design and technology (D&amp;T) skills through hands-on exploration. They construct models using blocks, junk modelling, and natural materials, developing their fine motor skills and problem-solving abilities as they begin to use tools such as scissors and other one-handed implements with increasing control. Children learn to join materials using glue, masking tape, hole punches, and treasury tags, which supports creativity, independence, and experimentation with different ways of building and creating.</p> <p>Children also have opportunities to take part in simple cooking activities such as making biscuits, pancakes, and seasonal treats like Easter bakes. They help to mix ingredients and prepare simple recipes, as well as make play dough. Through these experiences, children begin to observe how materials change and combine, giving them early opportunities to notice different states and textures while developing practical skills and confidence in following simple processes.</p>		
Year R	Substantive D&T content	Recurring themes, ideas and language	
Reception	Food: Baking Bread	<p>Reception children also take part in cooking and baking activities throughout the year. These experiences deepen their understanding of food, healthy eating, and how materials can change state through actions like <i>mixing, melting, heating, and cooling</i>.</p> <p>By the end of Reception, children are confidently expressing their ideas through a variety of media, selecting tools and techniques purposefully, and evaluating and improving their work. These experiences directly support their achievement of the Early Learning Goal for <i>Creating with Materials</i>, helping them to become imaginative, capable, and reflective young designers.</p>	<p>Pupils begin to develop an understanding of which foods are healthy and unhealthy. They connect learning about healthy lifestyles and diet, from other areas of the curriculum, to work in D&amp;T. Pupils begin to understand the importance of using cooking utensils safely and develop their fine motor skills to cut, knead, and shape the dough. <b>Contribution to wider D&amp;T knowledge and what later content this prepares for these skills are further developed in Year 1 when they make fruit fondue.</b></p>

	Workshop	<p>In Reception, children continue to develop their creativity and design skills through regular access to a well-resourced workshop area. Here, they are encouraged to explore a wide range of materials and tools independently and with purpose. Children are supported to plan their creations, make thoughtful choices, and talk about their ideas using increasingly specific vocabulary such as <i>design, create, model, material, connect</i> and <i>join</i>.</p> <p>As part of the design process, children are guided to reflect on what they have made, consider what worked well, and suggest ways to develop or improve their work. This fosters a growth mindset and encourages them to be creative problem-solvers. They begin to understand that design is a process that involves planning, doing, reviewing, and refining.</p> <p>Tools such as scissors, hole punches, glue, and joining materials like string, tape, treasury tags and split pins are introduced to support more complex creations. Children are taught how to use these tools safely and with increasing confidence and skills.</p>	<p>In Reception, children begin to develop an understanding of the design process through hands-on, purposeful experiences. They are encouraged to explore and talk about existing products, noticing how they are made and what makes them successful. This helps to spark ideas for their own creations and introduces the concept of designing with a purpose in mind. Children are supported to think about <i>who</i> their product is for and <i>what</i> it needs to do, helping them to establish simple criteria for success. With this in mind, they plan their work, choose appropriate tools and materials, and learn how to use them safely and effectively.</p> <p><b>This lays a strong foundation for more complex tasks in later years, such as creating a chair for a Teddy in year 1.</b></p>
Year 1 Autumn 2	<p>Know how to make freestanding structures stronger, stiffer and more stable</p> <p>Select from and use a wide range of materials and components according to characteristics and use simple cutting, shaping, joining and fastening skills</p> <p>Generate ideas based on simple design criteria</p> <p>Evaluate ideas and final product</p>	<p>Pupils explore and develop an understanding of 'freestanding structures' to enable them to plan efficiently to meet the design brief. Fine motor skills are developed as pupils continue to use tools to 'cut' and 'join' their chosen materials together to make a chair for a Teddy. Through focused tasks, they 'fold' paper and card in different ways and are encouraged to find ways to make their structures 'strong' and 'stable'. Pupils test the 'functionality' of their chairs, 'evaluate' the 'product' they have made and make suggestions for improvement.</p>	<p>Pupils continue to understand the importance of the different stages of the design process including exploring existing products to influence initial designs and considering purpose to establish criteria for a successful product. By developing an understanding of the design process, children can select tools and materials effectively and formulate clear plans for construction. <b>This prepares pupils for measuring, cutting and joining materials together effectively when assembling axles in Year 2.</b></p>

Year 1 Spring 1	Mechanisms: Sliders and levers	Pupils develop an understanding of book designs by comparing and contrasting products over time. They analyse construction methods to gain an understanding of the function of moving parts including 'sliders' and 'levers' and develop the vocabulary to describe these functions including 'pivot', 'left', 'right', 'push', 'pull', 'up' and 'down'. Through focused tasks, pupils select and use tools to 'cut', 'shape' and 'join' paper/card to produce simple 'mechanisms' such as 'flaps', 'sliders' and 'levers', understanding that different mechanisms produce different movement. They 'evaluate' their product in relation to the 'purpose', 'user' and simple 'design criteria'.	Pupils begin to understand the importance of the design process in order to meet a design brief for a specific audience. They develop their understanding of the movement of a variety of mechanisms and the function of a mechanism in a product. Pupils begin to self and peer evaluate their outcomes against the design brief and make suggested improvements. Through KS1/KS2 pupils continue to build on these skills of planning and evaluation. <b>Pupils' understanding of mechanisms is built on in Year 2 by exploring wheels and axles, which then prepares them for making a mechanism for a fairground in Year 5.</b>
	Product: Information book for a Year 1 pupil learning about the history of London Transport		
	Understand that different mechanisms produce different types of movement		
	Use simple cutting, shaping, joining and fastening skills		
	Generate ideas based on simple design criteria		
	Evaluate ideas and final product		
<b>Year 2</b>	<b>Substantive D&amp;T content</b>	<b>Recurring themes, ideas and language</b>	<b>Contribution to wider D&amp;T knowledge and what later content this prepares for</b>
Year 2 Autumn 1	Research - bridges around the world and Zaha Hadid fact file	Pupils understand why bridges were first constructed, exploring their historical role in overcoming natural obstacles and enabling safer travel and trade. Pupils investigate the different 'purposes' of bridges, including transport by foot, animals, and vehicles, and learn about the main 'types of bridges' such as beam, arch, truss, suspension, cantilever, cable-stayed, and movable. Through focused tasks, pupils explore the role of 'architects' in bridge design, including influential figures such as Zaha Hadid, and examine famous examples of bridges from around the world. Pupils consider which 'materials' and 'structural shapes' are most effective for strength and stability, and carry out practical activities to 'test' how much weight their bridges can hold.	Pupils build on their knowledge of how structures are designed and constructed to serve a purpose. This unit supports pupil understanding of materials, strength, stability and how different structural forms can be applied to solve real-world problems. Pupils develop confidence in testing and evaluating their designs, considering weight, balance and safety, which prepares them for more complex projects in KS2 involving moving mechanisms and larger-scale structures. This unit also develops their awareness of architectural design, inspiring creativity and innovation, and provides strong foundations for future units such as <b>shell structures in year 3.</b>
	Investigate - the different bridges and their structures as well as purposes		
	Design - choose a structural design of a bridge and draw a detailed diagram with annotations		
	Make - glueing, assembling, strengthen		
	Evaluate - how strong is the bridge, what weight can it hold, how could the structure be improved		
Year 2 Autumn 2	Food: Understand the history behind bread	Pupils understand where bread first originated from including the historical symbolism and how it has evolved over time. Pupils explore bread, through 'taste test evaluations', understanding	Pupils build on their knowledge of where ingredients come from and the production processes. This unit supports pupil understanding of hygiene, nutrition, healthy eating and a varied
	Product: Speciality bread to be served to children in the dining hall at lunchtime		

	Select and use appropriate utensils to measure and combine ingredients	how different 'ingredients' are used to create different 'products' and their 'designs' in relation to specific 'audiences'. Through focused tasks, pupils are given opportunities to follow and adapt 'basic recipes', practise 'weighing' accurately and develop 'cutting', 'shaping', 'rubbing' and 'kneading' skills. They explore whether the final product has met the 'intended design outcome' and 'evaluate' their product critically.	diet in preparation for KS2 where children are exposed to creating a wider range of dishes. Pupils develop confidence with using measuring scales accurately, are able to follow recipes step by step and adapt them for an intended audience. <b>This prepares pupils well for designing and making their own burgers in Year 6.</b>
	Evaluate ideas and final product taking into account the views of others when making improvements		
Year 2 Summer 1	Mechanisms: Wheels and axles	Pupils evaluate a range of products with 'wheels' and 'axles' before looking at the 'purpose' and 'key features' of an ambulance. They generate simple 'design criteria' and develop their own ideas for making a toy ambulance through talking and drawing. Through focused tasks, pupils learn how to 'assemble fixed and free axles'. They explore the use of a range of materials for different parts of their product, considering 'function' and 'strength' and how to 'measure', 'cut' and 'join' materials together effectively.	Pupils build their skills to understand the importance of how to create mechanisms and measure accurately <b>in preparation for the Year 4 unit on 'pop up' books. In Year 5 pupils consolidate their understanding of mechanisms</b> and are encouraged to independently select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement, where they are given the creative freedom to design their own fairground rides.
	Product: Toy ambulance for a 6 year old		
	Assemble fixed and free axles; mark out, hold, cut and join materials and components correctly		
<b>Year 3</b>	<b>Substantive D&amp;T content</b>	<b>Recurring themes, ideas and language</b>	<b>Contribution to wider D&amp;T knowledge and what later content this prepares for</b>
Year 3 Autumn 2	Textiles: 2-D shape to 3-D product	Pupils explore a range of existing bags to determine suitability of material and construction. They compare this with the use of animal hides in the Bronze Age. Through investigating how materials are 'joined' and 'finished' using a 'range of stitches', pupils develop simple design criteria for a product with an end user in mind. They create a simple 'pattern' and select appropriate tools and materials before 'cutting', 'joining' and 'finishing' their final bag. Pupils evaluate the outcome against the intended use.	Building on the skills of stitching, <b>pupils will further develop their understanding of sewing skills in Year 6</b> to make more complex designs for a Make Do and Mend project.
	Product: Bag designed for a Bronze Age hunter gatherer to collect their findings		
	Investigate and analyse products related to the final product		
	Select and use a range of tools to join fabric securely		
	Use simple patterns and templates for marking out including seam allowances		
Apply understanding of how to strengthen and reinforce material			
Year 3 Spring 2	Food: Understand and apply the principles of a healthy and varied diet	Pupils learn about the origins of pizza before investigating and evaluating a range of existing	When added to the knowledge learned in Year 4, 5 and 6 about preparing food safely and

	<p>Product: Pizza inspired by the local target audience</p> <p>Investigate and analyse a range of existing pizzas in order to develop design criteria</p> <p>Select appropriately from a range of utensils</p> <p>Continue to develop food preparation skills</p>	<p>pizzas for taste and texture. They carry out and record market research using IT tools to determine the design criteria most suitable for the target audience. Pupils select and explain their use of ingredients and the tools and equipment required to prepare toppings. They continue to develop a range of food preparation skills such as 'peeling', 'grating' and 'cutting and slicing' using the 'bridge' and 'claw' techniques. Pupils evaluate the final product with reference to the design criteria and the opinion of others.</p>	<p>hygienically, pupils will leave school armed with specific examples of food preparation skills that lead to successful cooking. Investigating the origins of pizza will help pupils appreciate how food has developed and been influenced by a variety of cultures and places. In learning about selecting and using appropriate utensils and equipment to prepare and combine ingredients, <b>pupils are prepared to carry out more accurate making and measuring in Year 4, 5 and 6.</b> Learning about where food comes from and how it influences modern recipes, enables children to start asking questions about what new recipes were influenced by – crucial for work on European food in Year 4.</p>
<p>Year 3 Summer 1/2</p>	<p>Structures: Shell structures</p> <p>Product: Keep-sake box for favourite belongings</p> <p>Develop knowledge of how to construct strong, stiff shell structures</p> <p>Select and use appropriate tools to measure, mark out, cut, score, shape and assemble</p> <p>Use finishing techniques suitable for the product they are creating</p> <p>Use knowledge of nets of 3D shapes</p>	<p>Pupils explore and evaluate a range of existing containers for 'purpose', 'construction' and 'suitability of materials' used. They investigate a range of 'nets' to create '3-D shapes' and, through focused tasks, learn how to 'measure', 'cut', 'score' and 'join' materials to make different shaped packages. Using what they know, they write a clear 'design brief' and 'design criteria' before selecting tools and materials to make their final product. Pupils consider the final 'appearance' by decorating their product. Evaluations will include consideration of 'suitability', 'durability', 'accuracy of construction' and 'aesthetic appeal'.</p>	<p>Pupils will gain an understanding of how shell structures are used and why they are a necessary element of packaging. They will be prepared to raise questions about how packaging is made and designed in different contexts. <b>Pupils will be prepared to choose tools and materials effectively when creating board games in Year 4.</b></p>
<b>Year 4</b>	<b>Substantive D&amp;T content</b>	<b>Recurring themes, ideas and language</b>	<b>Contribution to wider D&amp;T knowledge and what later content this prepares for</b>
<p>Year 4 Autumn 2</p>	<p>Food: Healthy and varied diet</p> <p>Product: Sandwich based upon regional ingredients</p> <p>Explore and make links to foods from different regions of Europe</p>	<p>Pupils will explore the geographical mapping of specific foods based upon regions of Europe, gathering information about existing foods and ingredients available. They will investigate products by carrying out 'sensory evaluations' of regional dishes in relation to 'taste', 'smell' and</p>	<p>In this unit pupils continue to develop a secure understanding of the geographical mapping of specific foods and where they originate from in Europe, and that they are processed and imported to the UK.</p>

	<p>Make choices about ingredients through evaluation and testing</p> <p>Use a variety of tools and equipment for spreading, grating and cutting</p>	<p>'texture'. By identifying the main ingredients of a dish pupils will deduce which 'food combinations' are successful and 'deconstruct' dishes to identify key elements to support the planning of their own designs. Through focused tasks, pupils learn to select and use a range of 'utensils' and techniques as appropriate, to prepare ingredients 'hygienically' including the 'bridge' and 'claw' techniques, 'grating', 'peeling', 'chopping', 'slicing', 'mixing' and 'spreading'.</p> <p>Pupils evaluate their on-going work to help refine their products and eventual outcomes, using a variety of technical vocabulary to help explain their understanding.</p>	<p>Building upon fine motor skills from previous years in relation to the preparation of food, pupils refine new techniques <b>in preparation for work in Year 5 to design and make a Viking Stew.</b></p>
<p>Year 4 Spring 1</p>	<p>Mechanical systems: Levers and linkages</p> <p>Product: Book of Greek Myths for a Year 1 pupil</p> <p>Analyse construction methods used to create moveable books, linkages and levers</p> <p>Select and use appropriate materials and equipment to measure, cut, join and assemble components to form a working lever or linkage mechanism</p> <p>Understand the difference between fixed and loose pivots</p> <p>Evaluate the functionality and quality of their product using technical vocabulary to explain</p>	<p>Building on knowledge gained of 'sliders' and 'levers' in Year 1 and 'wheels' and 'axles' in Year 2, pupils evaluate existing moveable books and products to develop their understanding of how 'levers' and 'linkage mechanisms' operate and create specific movements. Pupils add to their understanding of mechanisms that cause movement, exploring different types of 'joins' and how the application of transference forces can create 'direction' and 'movement'. They identify the necessary 'components' used to form basic levers such as 'pivots', 'outputs', 'guides' and 'inputs'.</p> <p>Applying the prerequisite skills of 'cutting', 'measuring', 'shaping' and 'joining', pupils assemble basic lever and linkage mechanism to create moveable 'pop up' book designs. They continue to develop accuracy and quality through the selection of appropriate tools and materials, and on-going evaluations of functionality against specific design criteria.</p>	<p>Pupils build upon existing knowledge of the design process in relation to analysing products, planning, using accurate diagrams and combining materials to form a final product. They develop their ability to explain why specific mechanisms are most effective and suited to specific products and movements. <b>This unit prepare pupils for the challenges of designing and making a mechanical system as part of a fairground ride in Year 5.</b></p>

Year 4 Summer 2	Electrical systems: Simple circuits and switches	<p>Pupils develop an understanding of board game designs by comparing and contrasting products and analysing construction methods. Through an evaluation of how products meet a user's needs, pupils identify strengths and areas for development that influence their own designs.</p> <p>They continue to broaden their understanding of 'electricity' in science in order to assemble 'basic circuits' as part of their design. They identify the 'components' required for a 'switch' in order to produce a working product and make design choices to reflect this.</p> <p>By identifying the main stages of making their product, pupils select appropriate tools and techniques. Refining skills related to construction, children 'measure', 'mark out', 'cut' and 'shape' a range of materials, using appropriate tools, equipment and techniques. To complete their board game products they 'join' and 'combine' materials and components accurately in 'temporary' and 'permanent' ways, enabling them to make continuous choices related to a final outcome.</p>	<p>Pupils continue to understand the importance of the different stages of the design process, exploring existing products to influence initial designs and considering purpose to establish criteria for a successful product.</p> <p>Based on an understanding of construction techniques from previous years pupils become more aware of the range of techniques to accurately assemble, join and combine materials.</p> <p><b>Pupils will develop their understanding of electronic circuits and specific components in Year 5.</b></p>
	Product: Children's board game to enhance knowledge of the Romans		
	Explore a range of board games and how they have developed over time		
	Investigate the use of simple circuits to enhance the appeal of board games		
	Construct a circuit with basic components, join and combine materials according to their functional properties and aesthetic qualities		
<b>Year 5</b>	<b>Substantive D&amp;T content</b>	<b>Recurring themes, ideas and language</b>	<b>Contribution to wider D&amp;T knowledge and what later content this prepares for</b>
Year 5 Autumn 2	Food: Celebrating culture and seasonality	<p>When added to knowledge of what constitutes a 'healthy diet', pupils take inspiration from design throughout history investigating food available to the Vikings with reference to 'seasonality'.</p> <p>Pupils refine their recipes using spices, a range of freely available vegetables and adapt to the modern plate. In addition, pupils build on prior skills of 'chopping', 'peeling' and 'slicing', ensuring that they remain safe. They evaluate their final product against a previously drawn up design</p>	<p>Becoming secure with designing and making savoury foods, with a healthy diet in mind, <b>ensures pupils are prepared to design, adapt and make healthy burgers in Year 6.</b></p>
	Product: Modern stew based on a Viking stew		
	Evaluate a Viking stew and improve using spices and more freely available vegetables		
	Understand seasonality in relation to food products		

	Use peeling, chopping, slicing, mixing, cooking and measuring	specification, taking into account the views of others when making improvements.	
Year 5 Spring 2/ Summer 1	Mechanical systems: Pulleys or gears	Building on previously taught skills, precise 'measuring', 'cutting' and 'joining' skills are developed to create a fairground ride with a specific audience in mind. Pupils further develop their understanding of circuits from Year 4 to allow their fairground rides to move on their own. Through focused tasks, they learn about different sized 'gears', investigate 'direction' and 'speed of rotation', and build working circuits. Pupils develop 'measuring', 'marking', 'cutting', 'shaping' and 'joining' skills using a range of tools as appropriate. Finally, pupils critically evaluate the 'quality' of their product, the 'manufacture', 'functionality', 'innovation' and 'fitness for purpose', by comparing it to the original design specification.	This unit consolidates previous experiences of simple mechanical systems ( <b>Year 2</b> ) as well as work incorporating simple electrical circuits and switches ( <b>Year 4</b> ).
	Product: Toy fairground ride		
	Design and make a mechanical system to make a fairground ride rotate		
	Design and make a wooden construction to support a mechanical system		
	Use sawing, cutting, drilling, gluing and sanding		
<b>Year 6</b>	<b>Substantive D&amp;T content</b>	<b>Recurring themes, ideas and language</b>	<b>Contribution to wider D&amp;T knowledge and what later content this prepares for</b>
Year 6 Autumn 1	Food: Celebrating culture and seasonality	Throughout the D&T curriculum in KS2, pupils learn the skills of product design, including extending the range, and evaluating products suggesting improvements. In this unit, pupils 'research' the origins of the burger and its impact on American culture. They 'analyse' the findings of research into the 'nutritional value' of a range of burgers, as well as carrying out 'sensory evaluations'. From this, pupils design their own burger 'recipe', communicating their intentions through 'exploded diagrams'. They select and use 'utensils' and 'equipment' to accurately 'measure' and 'combine' appropriate ingredients, 'shape a patty' and finally 'cook' their product. Pupils 'evaluate' their burger against their design specification, with the intended 'user' in mind.	When added to the knowledge that children gain in Years 4, 5 and 6 about <b>preparing food safely and hygienically</b> , pupils will leave school armed with specific examples of food preparation skills that lead to successful cooking. This unit also builds on the childrens' knowledge of <b>healthy diets</b> . At KS3, as part of their work with food, pupils are taught <b>how to cook and apply the principles of nutrition and healthy eating</b> . 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.
	Product: Burger as a new item on the school dinner menu		
	Research who invented the burger and investigate the impact of burgers on American culture		
	Research and analyse the nutritional value of various types of burgers		
	Choose a burger recipe according to sensory research		
	Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients		
	Evaluate the final product using a design specification		

Year 6 Spring 1	Textiles: Combining different fabric shapes	This unit, to create a cushion, builds on sewing skills learned in Year 3: making a bag for a Bronze Age hunter gatherer. Having developed an understanding of 'Make Do and Mend' through work in history, pupils consider how to 'repurpose' and 'recycle' materials. Through focus tasks, they learn to 'measure' and 'cut' fabric, 'pin', 'sew' and 'join' materials accurately using a variety of 'stitches'. They consider a range of ways of 'decorating' their cushion. Pupils evaluate their final product for 'functionality' and 'aesthetics'.	In KS3 children continue to design, make and evaluate. Through a variety of creative and practical activities, pupils are taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They work in a range of domestic and local contexts. This unit engages the <b>fashion</b> context.
	Product: Cushion linked to 'Make Do and Mend' campaign of WW2		
	Disassemble a cushion to investigate and evaluate how a cushion is made		
	Communicate design ideas using a diagram and step by step planning		
	Develop skills of threading a needle, joining textiles and using a range of stitches		
	Select from and use a range of tools and equipment to make a cushion that is accurately assembled and well finished		
	Evaluate the final product for functionality and aesthetics		