



## ST MARY'S CATHOLIC PRIMARY SCHOOL

# Design Technology – Progression of Skills and Knowledge

Design Technology (D&T) involves thinking about what products are used for and the needs of those who use them. A good D&T activity has to have sufficient depth and breadth to enable pupils to learn practical skills and provide them with the knowledge to make products that move/ light up/ are structurally sound and don't collapse/ are safe and healthy. Pupils need to be able to test, refine and develop the products they design and make to check that they work and improve them if they do not.


### EYFS

Teachers should:	Design	Make	Evaluate	By the end of EYFS children should be able to (linked to ELGs)
<p>Set up and engage children in learning experiences that help children to explore and combine different media with a purpose in mind. e.g. A chair for teddy. Allow children opportunities to Construct with a purpose in mind, using a variety of</p> <p><b>Resources</b> Provide children with a variety of learning experiences that develop their use of simple tools and techniques to shape assemble and join materials,</p>	<p>Can select appropriate resources. Can use gestures, talking and arrangements of materials and components to show design Can use represent their own ideas and thoughts, or those created by the teacher, through design and technology. Use language of designing and making (join, build, shape, longer, shorter, heavier etc.)</p>	<p>To be able to construct with a purpose and using a variety of resources. Use simple tools and techniques to create own products. Build and construct with a wide range of objects. Be able to select tools &amp; techniques to shape, assemble and join materials together. Replicate given structures with materials / components. Discuss how to make an activity safe and hygienic. Understand different media can be combined for a purpose</p>	<p>Adapt work if necessary. Dismantle, examine and talk about existing objects/structures. Consider and manage some risks. Practise some appropriate safety measures independently. To be able to talk about how things work. Look at similarities and differences between existing objects / materials / tools. Show an interest in technological toys. Be able to describe textures</p>	<p>By the end of EYFS children should be able to (linked to ELGs)</p> <p><b>Creating with Materials</b> Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p> <p><b>Speaking</b> Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary;</p> <p><b>Fine Motor</b> Use a range of small tools, including scissors, paint brushes and cutlery;</p>
<p><b>Technical Knowledge:</b>  <b>Materials and structures:</b> To be able to develop their own ideas through selecting and using materials and working on processes that interest them. Through their explorations they find out and make decisions about how media and materials can be combined and changed.  <b>Textiles:</b> Begin to be interested in and describe the texture of things.            Experiments to create different textures.  <b>Food and Nutrition:</b> To begin to understand some food preparation tools, techniques and processes.            Practise stirring, mixing, pouring, blending.            Discuss how to make an activity safe and hygienic.            Discuss the use of my senses.            Understand the need for variety in food.            Begin to understand that eating well contributes to good health.</p>				

<b>Vocabulary</b> Scissors Stick Join Cut Sew Material Card Strong Weak	<b>Assessment</b> Tell me about what you are making? Why did you choose to use this? How did you join this? What other way could you do this? Is this strong enough? What have you made?
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### YEAR 1/ 2 Design and Technology

#### Across KS1:

Teachers should	Generating, developing, modelling, and communicating ideas across KS1 <b>Across KS1 pupils should:</b>	Understanding contexts, users, and purposes <b>Across KS1 pupils should:</b>		By the end of KS1 children should be able to;
Talk about, explore and share a range of relevant products. Look closely at how the products are made and what their function is. Talk about how they are suitable for their use and the features that they have that support this. Show / model ideas exploring materials and testing things out. State the design criteria and what this means.	<ul style="list-style-type: none"> <li>• generate ideas by drawing on their own experiences</li> <li>• use knowledge of existing products to help come up with ideas</li> <li>• develop and communicate ideas by talking and drawing</li> <li>• model ideas by exploring materials, components, and construction kits and by making templates and mock-ups</li> <li>• use information and communication technology, where appropriate, to develop and communicate their ideas</li> </ul>	<ul style="list-style-type: none"> <li>• work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry, and the wider environment</li> <li>• state what products they are designing and making</li> <li>• say whether their products are for themselves or other users</li> <li>• describe what their products are for</li> <li>• say how their products will work</li> <li>• say how they will make their products suitable for their intended users</li> <li>• use simple design criteria to help develop their ideas</li> </ul>		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
Provide children with opportunities prior to planning and making to Explore: 	<ul style="list-style-type: none"> <li>• what products are</li> <li>• who products are for</li> <li>• what products are for</li> <li>• how products work</li> <li>• how products are used</li> </ul>			

	<ul style="list-style-type: none"> <li>• where products might be used</li> <li>• what materials products are made from</li> <li>• what they like and dislike about products</li> </ul>			
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### Planning and Making

Teachers should:	Planning	Practical skills and techniques	By the end of Year 1 children should
Model how to plan Make drawings and diagrams to support their thinking Talk about how they select tools and materials and why they have chosen them. Model how to measure, mark out, cut, shape, assemble and join. Look at a range of finishing techniques.	Across KS1 pupils should: <ul style="list-style-type: none"> <li>• plan by suggesting what to do next</li> <li>• select from a range of tools and equipment, explaining their choices</li> <li>• select from a range of materials and components according to their characteristics             <ul style="list-style-type: none"> <li>• Identify a purpose for what they intend to design and make</li> </ul> </li> <li>• Make simple drawings and label parts</li> </ul>	Across KS1 pupils should: <ul style="list-style-type: none"> <li>• follow procedures for safety and hygiene</li> <li>• use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components</li> <li>• measure, mark out, cut, and shape materials and components</li> <li>• assemble, join, and combine materials and components</li> <li>• use finishing techniques, including those from art and design</li> </ul>	Be able to create a simple plan and know what they need to do next. Select tools and equipment and say why they have chosen them. Work safely. Measure, mark out, cut, and shape materials Know how to join and finish their models use different techniques.

YEAR 1	Structures	Mechanisms	Cooking and nutrition	Textiles	By the end of year 1 Children should be able to;
Design	Learn the importance of a clear design criteria <ul style="list-style-type: none"> <li>• show individual preferences and requirements in a design</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how to adapt mechanisms, using bridges or guides to control the movement</li> <li>• Design a moving story book for a given audience</li> <li>• Design a vehicle that includes wheels, axles, and axle holders, which will allow the wheels to move</li> <li>• Create a clearly labelled drawing which illustrates movement</li> </ul>	Combine ingredients to make a product.	Use a template to create a design for a puppet	<ul style="list-style-type: none"> <li>• Draw on their own experience to help generate ideas</li> <li>• Suggest ideas and explain what they are going to do</li> <li>• Identify a target group for what they intend to design and make</li> <li>• Model their ideas in card and paper</li> </ul> Develop their design ideas applying findings from their earlier research

<p>Make</p>	<ul style="list-style-type: none"> <li>• Make stable structures from card, tape, and glue</li> <li>• Follow instructions to cut and assemble the supporting structure of a windmill</li> <li>• Make functioning turbines and axles which are assembled into a main supporting structure</li> </ul>	<ul style="list-style-type: none"> <li>• Follow a design to create a moving model that uses levers and sliders</li> <li>• Adapt mechanisms</li> </ul>	<p>Chop fruit and vegetables safely to make a smoothie</p> <ul style="list-style-type: none"> <li>• Identify if a food is a fruit or a vegetable</li> <li>• Learn where and how fruits and vegetables grow</li> </ul>	<p>Cut fabric neatly with scissors</p> <ul style="list-style-type: none"> <li>• Use joining methods to decorate a puppet</li> <li>• Sequence steps for construction</li> </ul>	<ul style="list-style-type: none"> <li>• Make their design using appropriate techniques</li> <li>• With help measure, mark out, cut, and shape a range of materials</li> <li>• Use tools <i>e.g. scissors and a hole punch</i> safely</li> <li>• Assemble, join, and combine materials and components together using a variety of temporary methods <i>e.g. glues or masking tape</i></li> <li>• Select and use appropriate fruit and vegetables, processes, and tools</li> <li>• Use basic food handling, hygienic practices, and personal hygiene</li> <li>• Use simple finishing techniques to improve the appearance of their product</li> </ul>
<p>Evaluate</p>	<p>Evaluate a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it is not</p> <ul style="list-style-type: none"> <li>• Suggest points for improvement</li> </ul>	<ul style="list-style-type: none"> <li>• Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed</li> <li>• Reviewing the success of a product by testing it with its intended audience</li> <li>• Testing mechanisms, identifying what stops</li> </ul>	<ul style="list-style-type: none"> <li>• Taste and evaluate different food combinations</li> <li>• Describe appearance, smell, and taste</li> <li>• Suggest information to be included on packaging</li> </ul>	<p>Reflect on a finished product, explain likes and dislikes</p>	<ul style="list-style-type: none"> <li>• Evaluate their product by discussing how well it works in relation to the purpose</li> <li>• Evaluate their products as they are developed, identifying strengths and possible changes they might make</li> </ul>

		wheels from turning, knowing • that a wheel needs an axle in order to move			<ul style="list-style-type: none"> <li>Evaluate their product by asking questions about what they have made and how they have gone about it</li> </ul>
Technical knowledge	Describe the purpose of structures, including windmills • Learn how to turn 2D nets into 3D structures <ul style="list-style-type: none"> <li>Learn that the shape of materials can be changed to improve the strength and stiffness of structures</li> <li>Understand that cylinders are a strong type of structure that are often used for windmills and lighthouses • Understand that windmill turbines use wind to turn and make the machines inside work • Understand that axles are used in structures and mechanisms to make parts turn in a circle • Develop an awareness of different structures for different purposes</li> </ul>	Learning that levers and sliders are mechanisms and can make things move • Identifying whether a mechanism • is a lever or slider and determining what movement the mechanism will make • Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement • Identifying what mechanism makes a toy or vehicle roll forwards • Learning that for a wheel to move it must be attached to an axle	Understand the difference between fruits and vegetables <ul style="list-style-type: none"> <li>Describe and group fruits by texture and taste</li> </ul>	Learn different ways in which to join fabrics together: pinning, stapling, gluing	Use and understand vocabulary introduced with each project. Recognise examples of the structures, mechanisms , joins etc in everyday objects.

YEAR 2	Structures	Mechanisms	Cooking	Textiles	By the end of Year 2 children should be able to ;
Design	Generate and communicate ideas using sketching and modelling <ul style="list-style-type: none"> <li>Learn about different types of structures, found</li> </ul>	Create a class design criterion for a moving monster <ul style="list-style-type: none"> <li>Design a moving monster for a specific</li> </ul>	Design a healthy wrap based on a food combination which work well together	Design a pouch	<ul style="list-style-type: none"> <li>Generate ideas by drawing on their own and other people's experiences</li> </ul>

	in the natural world and in everyday objects	audience in accordance with a design criterion <ul style="list-style-type: none"> <li>• Select a suitable linkage system to produce the desired motions</li> <li>• Design a wheel</li> <li>• Select appropriate materials based on their properties</li> </ul>			<ul style="list-style-type: none"> <li>• Develop their design ideas through discussion, observation, drawing and modelling</li> <li>• Identify a purpose for what they intend to design and make</li> <li>• Identify simple design criteria</li> <li>• Make simple drawings and label parts</li> </ul>
Make	Make a structure according to design criteria <ul style="list-style-type: none"> <li>• Create joints and structures from paper/card and tape</li> </ul>	Make linkages using card for levers and split pins for pivots <ul style="list-style-type: none"> <li>• Experiment with linkages adjust the widths, lengths and thicknesses of card used</li> <li>• Cut and assemble components neatly</li> <li>• Select materials according to their characteristics</li> <li>• Follow a design brief</li> </ul>	Slice food safely using the bridge or claw grip <ul style="list-style-type: none"> <li>• Construct a wrap that meets a design brief</li> </ul>	Select and cut fabrics for sewing <ul style="list-style-type: none"> <li>• Decorate a pouch using fabric glue or running stitch</li> </ul>	<ul style="list-style-type: none"> <li>• Begin to select tools and materials; use vocab' to name and describe them</li> <li>• Measure, cut and score with some accuracy</li> <li>• Use hand tools safely and appropriately</li> <li>• Assemble, join, and combine materials to make a product</li> <li>• Cut, shape, and join fabric to make a simple garment. Use basic sewing techniques</li> <li>• Follow safe procedures for food safety and hygiene</li> </ul> <p>Choose and use appropriate finishing techniques</p>
Evaluate	Explore the features of structures <ul style="list-style-type: none"> <li>• Compare the stability of different shapes</li> <li>• Test the strength of own structures</li> </ul>	Evaluate own designs against design criteria <ul style="list-style-type: none"> <li>• Use peer feedback to modify a final design</li> <li>• Evaluate different designs</li> </ul>	Describe the taste, texture and smell of fruit and vegetables <ul style="list-style-type: none"> <li>• Taste test food combinations and final products</li> </ul>	Troubleshoot scenarios posed by teacher <ul style="list-style-type: none"> <li>• Evaluate the quality of the stitching on others' work</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate against their design criteria</li> <li>• Evaluate their products as they are developed, identifying strengths and possible</li> </ul>

	<ul style="list-style-type: none"> <li>Identify the weakest part of a structure</li> <li>Evaluate the strength, stiffness, and stability of own structure</li> </ul>	<ul style="list-style-type: none"> <li>Test and adapt a design</li> </ul>	<ul style="list-style-type: none"> <li>Describe the information that should be included on a label</li> <li>Evaluate which grip was most effective</li> </ul>	<ul style="list-style-type: none"> <li>Discuss as a class, the success of their stitching against the success criteria</li> <li>Identify aspects of their peers' work that they particularly like and why</li> </ul>	<p>changes they might make</p> <p>Talk about their ideas, saying what they like and dislike about them</p>
Technical knowledge	<ul style="list-style-type: none"> <li>Identify natural and man-made structures</li> <li>Identify when a structure is more or less stable than another</li> <li>Know that shapes and structures with wide, flat bases or legs are the most stable</li> <li>Understand that the shape of a structure affects its strength</li> <li>Use the vocabulary: strength, stiffness, and stability</li> <li>Know that materials can be manipulated to improve strength and stiffness</li> <li>Building a strong and stiff structure by folding paper</li> </ul>	<ul style="list-style-type: none"> <li>Learn that mechanisms are a collection of moving parts that work together in a machine</li> <li>Learn that there is an input and output in a mechanism</li> <li>Identify mechanisms in everyday objects</li> <li>Learn that a lever is something that turns on a pivot</li> <li>Learning that a linkage is a system of levers that are connected by pivots</li> <li>Explore wheel mechanisms</li> <li>Learn how axels help wheels to move a vehicle</li> </ul>	<ul style="list-style-type: none"> <li>Understand what makes a balanced diet</li> <li>Know where to find the nutritional information on packaging</li> <li>Know the five food groups</li> </ul>	<ul style="list-style-type: none"> <li>Join items using fabric glue or stitching</li> <li>Identify benefits of these techniques</li> <li>Thread a needle</li> <li>Sew using a running stitch, with evenly spaced, neat, even stitches to join fabric</li> <li>Neatly pin and cut fabric using a template.</li> </ul>	<ul style="list-style-type: none"> <li>Use specific vocabulary that they have been taught</li> <li>Be able to recognise and name examples of different structures, mechanisms and joining methods in their environment and to begin to express an opinion about their features/ uses.</li> </ul>

### Evaluating

Teachers should:	Across KS1 pupils should As a class	Small groups	One to one	By the end of the year children should
Question children at each stage of the process about their ideas, plans and choices of materials.	<ul style="list-style-type: none"> <li>talk about their design ideas and what they are making</li> <li>Ask if they have had to make any adaptations and why</li> </ul>	<ul style="list-style-type: none"> <li>make simple judgements about their products and ideas against design criteria</li> </ul>	<ul style="list-style-type: none"> <li>suggest how their products could be improved</li> </ul>	<ul style="list-style-type: none"> <li>Recognise if products are fit for purpose</li> <li>Know the features that make them function correctly</li> <li>Know what could be improved upon and know how they could do this another time.</li> </ul>

### Knowledge and understanding

Teachers should	Formal – Across KS1 pupils should know:	Experiential	By the end of KS1 children should have been given the opportunity to;
Recognise that a more valuable learning experience in design and technology comes from children exploring products and generating ideas based on their experiences. Then being taught a mixture of technical, formal knowledge as well as being given the opportunity to experiment with these processes for themselves. Show how to invent and design and overcome issues in order to create a product.	<ul style="list-style-type: none"> <li>• about the simple working characteristics of materials and components</li> <li>• about the movement of simple mechanisms such as levers, sliders, wheels, and axles</li> <li>• how freestanding structures can be made stronger, stiffer, and more stable</li> <li>• that a 3-D textiles product can be assembled from two identical fabric shapes</li> <li>• that food ingredients should be combined according to their sensory characteristics</li> <li>• the correct technical vocabulary for the projects they are undertaking</li> </ul>	<p>Each child should have to opportunity to discover</p> <p>That design and technology is relevant in a range of contexts [for example, the home and school, gardens and playgrounds, the local community, industry, and the wider environment].</p> <p>Begin to feel confident at expressing their preferences but recognise that it may not be the same as their friend</p> <p>Understand that they can get ideas by exploring first hand</p> <p>Begin to build a knowledge of what different materials behave like and start to recognise what you can use them for .</p>	<ul style="list-style-type: none"> <li>• Discover that Design and Technology has a significant purpose in our lives.</li> <li>• Begin to feel confident to express their ideas about different products and to be able to say what works well and why.</li> <li>• Experience the connection between brain, hand, and eye</li> <li>• Understand ideas can come through hands-on exploration</li> <li>• Begin to build knowledge of what different materials and techniques can offer the creative individual</li> <li>• Work at different scales, alone and in groups</li> </ul>

Key Vocabulary				
KS1	FOOD	TEXTILES	SPECIFIC MAKING	GENERAL (ACROSS ALL D&T WORK)
	Amount Baking Sheet Basin Chopping Board Cleaning cloths Grater Ingredients Knead	Centimetre/metre Fabric crayons Fabric pens Needle Pattern Pin Ribbon	2-D 3-D Clay Cut Materials Metal Plastic	Design Plan Product Criteria Evaluate



	Masher Measure Measuring jug Measuring spoons Method Mixing bowl Pastry cutters Peeler Pizza tray Recipe Saucepans Scales Sieve Weigh Wooden spoon	Silk Stitch Tape measure Thread Velcro Wool Zip	PVA glue Wire Wood Levers Sliders Wheels Axels Linkage Structures Stronger Stiffer Stable/ stability Pivot	
<b>ASSESSMENT QUESTIONS</b>	<p>Tell me about what you have made?  Why do you choose to use / make it from this?  What was the most difficult part of making it?  How did you overcome any challenges?  Does your product do what you wanted it to do?  What are its strengths?  What possible changes did you make / could you make?  What are you most pleased with about it?</p>			

## KS2 Design and Technology

### *Generating ideas*

Teachers should:	Generating, developing, modelling, and communicating ideas across KS1 <b>Across KS2 pupils should:</b>	Understanding contexts, users, and purposes <b>Across KS2 pupils should:</b>	By the end of KS2 children should be able:
use existing products to inspire pupils and to support their investigations, testing, and analysis Use focused tasks and demonstrate effectively Use their own work to model ideas, and to explain the methods they use to identify the problem or to tackle a task	<ul style="list-style-type: none"> <li>• share and clarify ideas through discussion</li> <li>• model their ideas using prototypes and pattern pieces</li> <li>• use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas</li> <li>• use computer-aided design to develop and communicate their ideas</li> </ul> <b>In early KS2 pupils should also:</b>	<ul style="list-style-type: none"> <li>• work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment</li> <li>• describe the purpose of their products</li> <li>• indicate the design features of their products that will appeal to intended users</li> <li>• explain how particular parts of their products work</li> </ul> In early KS2 pupils should also: <ul style="list-style-type: none"> <li>• gather information about the needs and wants of</li> </ul>	To investigate existing products that they know, and use them to support with their designs Test out ideas Explain their thinking

<p>use resources effectively and adapt for children who need it. Use targeted questioning Encourage classes to contribute to the development of success criteria Model and use technical language and subject-specific terms accurately Structure learning effectively to encourage the pooling of ideas and findings. Support pupils evaluating and extending or improving the ideas ensure D&amp;T was relevant by linking activity to pupils' interests, establishing real contexts for their work,</p>	<ul style="list-style-type: none"> <li>• generate realistic ideas, focusing on the needs of the user</li> <li>• make design decisions that take account of the availability of resources</li> </ul> <p><b>In late KS2 pupils should also:</b></p> <ul style="list-style-type: none"> <li>• generate innovative ideas, drawing on research</li> <li>• make design decisions, taking account of constraints such as time, resources, and cost</li> </ul>	<p>individuals and groups • develop their own design criteria and use these to inform their ideas In late KS2 pupils should also: • carry out research, using surveys, interviews, questionnaires, and web-based resources • identify the needs, wants, preferences and values of individuals and groups • develop a simple design specification to guide their thinking</p>	<p>Use the success criteria to help create a successful product</p> <p>Make use of resources Make clear decisions</p>
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**Planning and Making across KS2**

<p>Teachers should:</p>	<p>Planning Across KS 2 children should:</p>	<p>Practical skills and techniques Across KS2 children should:</p>	<p>By the end of KS2 children should be able to;</p>
<p>Plan opportunities for children to find out how products work and how well they fit their purpose and meet the needs of users:</p> <ul style="list-style-type: none"> <li>• Ensure lessons build firmly on pupils' earlier learning and ensure progressive challenge, breadth and depth to their designing and making</li> <li>• Use good individual questioning and well-managed class discussion enable pupils to confidently develop design criteria in response to design briefs</li> <li>• show examples of their own work to support pupils' understanding of the mechanisms and construction required to design and make products safely and accurately</li> <li>• Focus clearly on what pupils need to learn, and demonstrate the activities required to bring this about</li> <li>• Use a range of resources, including ICT and computer-aided design</li> </ul>	<p>Select tools and equipment suitable for the task</p> <ul style="list-style-type: none"> <li>• explain their choice of tools and equipment in relation to the skills and techniques they will be using</li> <li>• select materials and components suitable for the task</li> <li>• explain their choice of materials and components according to functional properties and aesthetic qualities</li> </ul> <p><b>In early KS2 pupils should also:</b></p> <ul style="list-style-type: none"> <li>• order the main stages of making</li> </ul> <p><b>In late KS2 pupils should also:</b></p> <ul style="list-style-type: none"> <li>• produce appropriate lists of tools, equipment, and materials that they need</li> <li>• formulate step-by-step plans as a guide to making</li> </ul>	<ul style="list-style-type: none"> <li>• follow procedures for safety and hygiene</li> <li>• use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components, and electrical components</li> </ul> <p><b>In early KS2 pupils should also:</b></p> <ul style="list-style-type: none"> <li>• measure, mark out, cut, and shape materials and components with some accuracy</li> <li>• assemble, join, and combine materials and components with some accuracy</li> <li>• apply a range of finishing techniques, including those from art and design, with some accuracy</li> </ul> <p>In late KS2 pupils should also:</p> <ul style="list-style-type: none"> <li>• accurately measure, mark out, cut, and shape materials and components</li> <li>• accurately assemble, join, and combine materials and components</li> <li>• accurately apply a range of finishing techniques, including those from art and design</li> </ul>	<p>Tackle challenges that are increasingly sophisticated</p> <p>Children should think like designers apply their technological knowledge, understanding of complex principles and construction techniques.</p>

		<ul style="list-style-type: none"> <li>• use techniques that involve several steps</li> <li>• demonstrate resourcefulness when tackling practical problems</li> </ul>	
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### Evaluating

Teachers should:	Across KS2 pupils should, as a class:	In small groups:	One to one	By the end of the KS2 children should
<ul style="list-style-type: none"> <li>• Help children investigate and analyse a range of existing products</li> <li>• Encourage children to evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</li> <li>• understand how key events and individuals in design and technology have helped shape the world</li> <li>• investigate new and emerging technologies</li> <li>• test, evaluate and refine their ideas and products against a specification, considering the views of intended users and other interested groups</li> </ul>	<p>Investigate a range of products Talk about -how well products have been designed</p> <ul style="list-style-type: none"> <li>• how well products have been made</li> <li>• why materials have been chosen</li> <li>• what methods of construction have been used</li> <li>• how well products work</li> <li>• how well products achieve their purposes</li> <li>• how well products meet user needs and wants</li> </ul> <p>Evaluate, test and question what they are going to make and have made throughout the process against the criteria Make adaptations and improvements when necessary.</p> <p>Talk about designers and the impact their work has / had on shaping the world <b>In early KS2 pupils should also investigate and analyse:</b></p> <ul style="list-style-type: none"> <li>• who designed and made the products</li> <li>• where products were designed and made</li> <li>• when products were designed and made</li> <li>• whether products can be recycled or reused</li> </ul> <p><b>In late KS2 pupils should also investigate and analyse:</b></p> <ul style="list-style-type: none"> <li>• how much products cost to make</li> <li>• how innovative products are</li> <li>• how sustainable the materials in products are</li> <li>• what impact products have beyond their intended purpose</li> </ul>	<p>Showcase and talk about their ideas and designs</p> <p>Test them out</p> <p>Talk about how they achieve the criteria set</p> <p>What is good about the design?</p>	<p>What difficulties if any did you have to overcome? What changes did you make?</p> <p>Were you influenced by any designs you have seen?</p>	<p>Be able to analyse and know about existing products and know how to use these to support them with their own designs Critically analyse their own designs and that of their classmates – thinking about the intended purpose and outcome. Know how to make changes to improve their work, recognising this is all part of the process of becoming a designer.</p> <p>Be able to test, evaluate and refine ideas.</p> <p>Know about other designers and know how they have helped shaped the world.</p>

## Knowledge and understanding

Teachers should	Across KS2 pupils should know:	By the end of KS 2 it will be evident that children are showing good achievement and challenge if they can:
<p>Model using the technical vocabulary</p> <p>Give formative feedback – question pupils to deepen their learning Identify the things the pupils is / has done well and where they need to make improvements Allow children to take responsibility for their own learning when they can.</p> <p>Give specific targets with support on how they can achieve them.</p> <p>Encourage children to respond and comment reflecting on their learning conversations in their DT journals alongside their planning.</p> <p>Track, analyse and assess throughout projects.</p>	<ul style="list-style-type: none"> <li>• how to use learning from science / mathematics to help design and make products that work</li> <li>• that materials have both functional properties and aesthetic qualities and that they can be combined</li> <li>• that mechanical and electrical systems have an input, process, and output</li> <li>• the correct technical vocabulary for the projects they are undertaking</li> </ul> <p><b>In early KS2 pupils should also know:</b></p> <ul style="list-style-type: none"> <li>• how mechanical systems such as levers and linkages or pneumatic systems create movement</li> <li>• how simple electrical circuits and components can be used to create functional products</li> <li>• how to program a computer to control their products</li> <li>• how to make strong, stiff shell structures</li> <li>• that a single fabric shape can be used to make a 3D textiles product</li> <li>• that food ingredients can be fresh, pre-cooked and processed</li> </ul> <p><b>In upper KS2 pupils should also know:</b></p> <ul style="list-style-type: none"> <li>• how mechanical systems such as cams or pulleys or gears create movement</li> <li>• how more complex electrical circuits and components can be used to create functional products</li> <li>• how to program a computer to monitor changes in the environment and control their products</li> <li>• how to reinforce and strengthen a 3D framework</li> <li>• that a 3D textiles product can be made from a combination of fabric shapes</li> </ul> <p><b>Food and nutrition</b></p> <ul style="list-style-type: none"> <li>• that a recipe can be adapted by adding or substituting one or more ingredients how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source</li> <li>• how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading, and baking</li> </ul> <p><b>In lower KS2 pupils should also know:</b></p> <ul style="list-style-type: none"> <li>• that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eat well plate</li> <li>• that to be active and healthy, food and drink are needed to provide energy for the body</li> </ul> <p><b>In upper KS2 pupils should also know:</b></p> <ul style="list-style-type: none"> <li>• that recipes can be adapted to change the appearance, taste, texture, and aroma</li> </ul>	<p>By the end of KS 2 it will be evident that children are showing good achievement and challenge if they can:</p> <ul style="list-style-type: none"> <li>• demonstrate a secure understanding of who they are designing and making for, the purpose of the product and how it would work, and the specific criteria their product must meet to be successful</li> <li>• communicate their innovative ideas and plans clearly and modify their designs and prototypes considering their testing and evaluation</li> <li>• develop technical competence, applying measurement and using tools and components with increasing accuracy to safely make well-finished products</li> <li>• draw effectively upon their scientific understanding and their knowledge of mechanisms, structures, forces, or the effect of heat to create and explain how their products work</li> <li>• use an increasingly technical vocabulary when talking or writing about what they might change as their work develops.</li> </ul>

• that different food and drink contain different substances – nutrients, water, and fibre  
– that are needed for health

Vocabulary Food	Textiles	Specific making (all D&T topics)	Key vocabulary (all D&T topics)	Assessment questions
Grams/Kilograms Hygiene Ladle Millilitre/Litre Spatula Temperature Whisk	Back stich Binca Bodkin Cotton thread Cross stitch Hook and eye Loom Pinking Shears Press stud Running stitch Seam allowance Sewing machine Tacking Thimble	Tenon saw Vice Wire Strippers Screws Nails Accurate Marking out Jointer Junior Hacksaw Motor Pliers Rotary Cutter Safety ruler Screwdriver Side cutters Snips Spanner Stapler Dowel Battery Battery Holder Light Bulb Bulb Holder Buzzer	Gears Glass paper Sand paper Bench Hook Bradawl Crocodile Clip Coping saw Disassemble Cutting Mat Drill Drill bits File G-Clamp Goggles Safety glasses Hammer Hole Punch Compass Pulley Switches Wheel Millimetre Saw	Analyse Combine Construct Criteria Evaluate Health and safety Parameters Requirements Pro type
				<p>How well does your product meet the design / success criteria? Does your product work? What materials did you use to make it form and why did you select them?</p> <p>What was the most difficult part of making it? How did you overcome any challenges? What are its strengths? What possible changes did you make / could you make? What are you most pleased with about it?</p>

YEAR 3	Structures	Mechanisms	Cooking	Textiles	Electrical systems
Design	Design a product with key features to appeal to a specific person/ purpose • Drawing and labelling a design using 2D shapes, labelling: - the 3D shapes that will create the features -	Designing a product which uses a <b>pneumatic system</b> • Developing design criteria from a design brief • Generating ideas using thumbnail sketches and exploded diagrams	Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell, and appearance of the dish	Design making a template from an existing product and applying individual design criteria	Design a product that uses a simple electrical circuit to make a light.

	materials need and colours	<ul style="list-style-type: none"> <li>• Learning that different types of drawings are used in design to explain ideas clearly</li> </ul>			
Make	<p>Constructing a range of 3D geometric shapes using nets</p> <ul style="list-style-type: none"> <li>• Creating special features for individual designs</li> <li>• Making facades from a range of recycled materials</li> </ul>	<p>Creating a pneumatic system to create a desired motion</p> <ul style="list-style-type: none"> <li>• Building secure housing for a pneumatic system</li> <li>• Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy</li> <li>• Selecting materials due to their functional and aesthetic characteristics</li> <li>• Manipulating materials to create different effects by cutting, creasing, folding, weaving</li> </ul>	<p>Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination</p> <ul style="list-style-type: none"> <li>• Following the instructions within a recipe</li> </ul>	<p>Follow a design criterion to make a product</p> <ul style="list-style-type: none"> <li>• Selecting and cutting fabrics with ease using fabric scissors</li> <li>• Sewing cross stitch to join fabric</li> <li>• Decorating fabric using appliqué</li> <li>• Completing design ideas with stuffing and sewing the edges</li> </ul>	<ul style="list-style-type: none"> <li>• Making a product that uses an electrical circuit following their design.</li> <li>• Using a range of materials and equipment safely</li> </ul>
Evaluation	<p>Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison, to the original design</p> <ul style="list-style-type: none"> <li>• Suggesting points for modification of the individual designs</li> </ul>	<p>Using the views of others to improve designs</p> <ul style="list-style-type: none"> <li>• Testing and modifying the outcome, suggesting improvements</li> </ul>	<p>Establishing and using design criteria to help test and review dishes</p> <ul style="list-style-type: none"> <li>• Describing the benefits of seasonal fruits and vegetables and the impact on the environment</li> <li>• Suggesting points for improvement when making a seasonal tart</li> </ul>	<p>Evaluating an end product and thinking of other ways in which to create similar items</p>	<p>Learning to give constructive criticism on own work and the work of others</p> <ul style="list-style-type: none"> <li>• Testing the success of a product against the original design criteria and justifying opinions</li> </ul>
Technical knowledge	<ul style="list-style-type: none"> <li>• Identifying features of a building</li> <li>• Identifying suitable materials to be selected and used for a castle, considering weight, compression, tension</li> <li>• Extending the knowledge of wide and flat based objects are more stable</li> </ul>	<p>Understanding how pneumatic systems work</p> <ul style="list-style-type: none"> <li>• Learning that mechanisms are a system of parts that work together to create motion</li> <li>• Understanding that pneumatic systems can be used as part of a mechanism</li> <li>• Learning</li> </ul>	<p>climate affects food growth</p> <ul style="list-style-type: none"> <li>• Working with cooking equipment safely and hygienically</li> <li>• Learning that imported foods travel from far away and this can negatively impact the environment</li> <li>• Learning that vegetables and fruit</li> </ul>	<p>Threading needles with greater independence</p> <ul style="list-style-type: none"> <li>• Tying knots with greater independence</li> <li>• Sewing cross stitch and appliqué</li> <li>• Understanding the need to count the thread on a piece of even weave fabric in</li> </ul>	<p>Understanding what a circuit is and how to make one.</p> <p>Recognise that if there is a break in the circuit electricity the light will not work.</p>

	Understanding the terminology of strut, tie, span, beam • Understanding the difference between frame and shell structure	that pneumatic systems force air over a distance to create movement	grow in certain seasons • Learning that each fruit and vegetable gives us nutritional benefits • Learning to use, store and clean a knife safely	each direction to create uniform size and appearance • Understanding that fabrics can be layered for affect	
<b>YEAR 4</b>	<b>Structures</b>	<b>Mechanisms</b>	<b>Cooking and nutrition</b>	<b>Textiles</b>	<b>Electrical systems</b>
Design	Design a stable structure that is aesthetically pleasing and selecting materials to create a desired effect • Building frame structures designed to support weight	<ul style="list-style-type: none"> <li>• Think about the shape of designs</li> <li>• Drawing a net to create a structure from</li> <li>• Choosing shapes that increase or decrease speed because of air resistance •</li> </ul> Personalising a design	Designing a food product within a given budget, drawing upon previous taste testing	Writing a design criterion for a product, articulating decisions made • e.g. Designing a personalised Book sleeve	Design a product , giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas
Make	Creating a range of different shaped frame structures <ul style="list-style-type: none"> <li>• Making a variety of free-standing frame structures of different shapes and sizes</li> <li>• Selecting appropriate materials to build a strong structure and for the cladding •</li> </ul> Reinforcing corners to strengthen a structure • Creating a design in accordance with a plan <ul style="list-style-type: none"> <li>• Learning to create different textural effects with materials</li> </ul>	Measuring, marking, cutting, and assembling with increasing accuracy <ul style="list-style-type: none"> <li>• Making a model based on a chosen design</li> </ul>	<ul style="list-style-type: none"> <li>• Following a baking recipe •</li> <li>• Cooking safely, following basic hygiene rules •</li> <li>• Adapting a recipe</li> </ul>	Making and testing a paper template with accuracy and in keeping with the design criteria • Measuring, marking and cutting fabric using a paper template • Selecting a stitch style to join fabric, working neatly sewing small neat stitches • Incorporating fastening to a design	Making a torch/ light with a working electrical circuit and <u>switch</u> • Using appropriate equipment to cut and attach materials • Assembling a torch according to the design and success criteria <ul style="list-style-type: none"> <li>•</li> </ul>
Evaluation	<ul style="list-style-type: none"> <li>• Evaluating structures made by the class •</li> <li>• Describing what characteristics of a design and construction made it the most effective •</li> <li>• Considering</li> </ul>	Evaluating the speed of a final product based on the effect of shape on speed and the accuracy of workmanship on performance	Evaluating a recipe, considering taste, smell, texture, and appearance <ul style="list-style-type: none"> <li>• Describing the impact of the budget on the selection of ingredients •</li> </ul> Evaluating and comparing a range of	Testing and evaluating an end product against the original design criteria • Deciding how many of the criteria should be met for the product to be considered successful •	Evaluating electrical products • Testing and evaluating the success of a final product and taking inspiration from the work of peers

	effective and ineffective designs		products • Suggesting modifications	Suggesting modifications for improvement •	
Technical knowledge	Learning what buildings are and their purpose • Building on prior knowledge of net structures and broadening knowledge of frame structures • Learning that architects consider light, shadow and patterns when designing • Implementing frame and shell structure knowledge • Considering effective and ineffective designs	• Learning that products change and evolve over time • Learning that all moving things have kinetic energy • Understanding that kinetic energy is the energy that something (object person) has by being in motion	Understanding the impact of the cost and importance of budgeting while planning ingredients for biscuits • Understanding the environmental impact on future product and cost of production	Understanding that there are different types of fastenings and what they are • Articulating the benefits and disadvantages of different fastening types	Learning how electrical items work • Identifying electrical products • Learning what electrical conductors and insulators are • Understanding that a battery contains stored electricity and can be used to power products • Identifying the features of a torch • Understanding how a torch works • Articulating the positives and negatives about different torches

YEAR 5	Structures	Mechanisms	Cooking and nutrition	Textiles	Electrical systems
Design	Design a stable structure that can support weight • Creating frame structure with focus on triangulation	Designing a mixture of structures and mechanisms • Naming each mechanism, input, and output accurately • Storyboarding ideas for a book	Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients • Writing an amended method for a recipe to incorporate the relevant changes to ingredients • Designing appealing packaging to reflect a recipe	Design a stuffed toy considering the main component shapes required and creating an appropriate template • Considering proportions of individual components	Design an electronic greetings card with a simple electrical control circuit • Creating a labelled design showing positive and negative parts in relation to the LED and the batter
Make	Make a range of different shaped beam bridges • Using triangles to create truss bridges that span a	Following a design focus on accuracy • Making mechanisms and/ or structures using sliders, pivots, and folds to	Cutting and preparing vegetables safely • Using equipment safely, including knives, hot pans, and hobs •	Creating a 3D stuffed toy from a 2D design • Measuring, marking, and cutting fabric accurately and	Making a working circuit • Creating electronics greeting card, referring to a design criterion • Mapping out where different components of the circuit will go



	<ul style="list-style-type: none"> <li>given distance and supports a load</li> <li>Building a wooden bridge structure</li> <li>Independently measuring and marking wood accurately</li> <li>Selecting appropriate tools and equipment for particular tasks</li> <li>Using the correct techniques to saws safely</li> <li>Identifying where a structure needs reinforcement and using card corners for support</li> </ul>	<ul style="list-style-type: none"> <li>produce movement</li> <li>Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result</li> </ul>	<ul style="list-style-type: none"> <li>Knowing how to avoid cross contamination</li> <li>Following a step by step method carefully to make a recipe</li> </ul>	<ul style="list-style-type: none"> <li>independently</li> <li>Creating strong and secure blanket stitches when joining fabric</li> <li>Using applique to attach pieces of fabric decoration</li> </ul>	
Evaluation	<ul style="list-style-type: none"> <li>Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary</li> <li>Suggesting points for improvements for own bridges and those designed by others</li> </ul>	<ul style="list-style-type: none"> <li>Evaluating the work of others and receiving feedback on own work</li> <li>Suggesting points for improvement</li> </ul>	<ul style="list-style-type: none"> <li>Identifying the nutritional differences between different products and recipes</li> <li>Identifying and describing healthy benefits of food groups</li> </ul>	<ul style="list-style-type: none"> <li>Testing and evaluating a product and giving point for further improvements</li> </ul>	<ul style="list-style-type: none"> <li>Evaluating a completed product against the original design sheet and looking at modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of electronic device, e.g.: buzzer</li> </ul>
Technical knowledge	<ul style="list-style-type: none"> <li>Exploring how to create a strong beam</li> <li>Identifying arch and beam bridges and understanding the terms: compression and tension</li> <li>Identifying stronger and weaker structures</li> <li>Finding different ways to reinforce structures</li> <li>Understanding how triangles can be used to reinforce bridges</li> <li>Articulating the difference between</li> </ul>	<ul style="list-style-type: none"> <li>Knowing that an input is the motion used to start a mechanism</li> <li>Knowing that output is the motion that happens as a result of starting the input</li> <li>Knowing that mechanisms control movement</li> <li>Describing mechanisms that can be used to change one kind of motion into another</li> </ul>	<ul style="list-style-type: none"> <li>Understanding where food comes from - learning that beef is from cattle and how beef is reared and processed</li> <li>Understanding what constitutes a balanced diet</li> <li>Learning to adapt a recipe to make it healthier</li> <li>Comparing two adapted recipes using a nutritional calculator and then identifying the healthier option</li> </ul>	<ul style="list-style-type: none"> <li>Learning to sew blanket stitch to join fabric</li> <li>Applying blanket stitch so the space between the stitches are even and regular</li> <li>Threading needles independently</li> </ul>	<ul style="list-style-type: none"> <li>Learning the key components used to create a functioning circuit</li> <li>Learning that graphite is a conductor and can be used as part of a circuit</li> <li>Learning the difference between series and parallel circuits</li> <li>Understanding that breaks in a circuit will stop it from working</li> </ul>

	beam, arch, truss and suspension bridges				
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YEAR 6	Structures	Mechanisms	Cooking	Textiles	Electrical systems
Design	Design a variety of different structures, considering how the structures will be used, considering effective and ineffective designs	experiment with a range of cams, creating a design based on a choice of cam to create a desired movement • Understanding how linkages change the direction of a force • Making things move at the same time	• Writing a recipe, explaining the key steps, method, and ingredients • Including facts and drawings from research undertaken	Design a waistcoat in accordance with specification linked to set of design criteria to fit a specific theme • Annotating designs	Design a steady hand game - identifying and naming the components required • Drawing a design from three different perspectives • Generating ideas through sketching and discussion • Modelling ideas through prototypes
Make	Building a range of play apparatus structures drawing upon new and prior knowledge of structures • Measuring, marking, and cutting wood to create a range of structures • Using a range of materials to reinforce and add decoration to structures	Measuring, marking and checking the accuracy of the jelutong and dowel pieces required • Measuring, marking and cutting components accurately using a ruler and scissors • Assembling components accurately to make a stable frame • Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles • Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set	Following a recipe including using the correct quantities of each ingredient • Adapting a recipe based on research • Working to a given timescale • Working safely and hygienically with independence	Using template pinning panels onto fabric • Marking and cutting fabric accurately, in accordance with a design • Sewing a strong running stitch, making small, neat stitches and following the edge • Tying strong knots • Decorating a waistcoat - attaching objects using thread and adding a secure fastening	Making electromagnetic motors and tweaking the motor to improve its function • Constructing a stable base for an electromagnetic game • Accurately cutting, folding and assembling a net • Decorating the base of the game to a high quality finish • Making and testing a circuit • Incorporating a circuit into a base

Evaluation	Improving a design plan based on peer evaluation • Testing and adapting a design to improve it as it is developed • Identifying what makes a successful structure	Evaluating the work of others and receiving feedback on own work • Applying points of improvements • Describing changes they would make/ do if they were to do the project again	Evaluating a recipe, considering taste, smell, texture, and origin of the food group • Taste testing and scoring final products • Suggesting and writing up points of improvements in productions • Evaluating health and safety in production to minimise cross contamination	Evaluating work continually as it is created	Testing own and others finished games, identifying what went well and making suggestions for improvement
Technical knowledge	Knowing that structures can be strengthened by manipulating materials and shapes • Identifying the shell structure in everyday life (cars, aeroplanes, tins, cans) • Understanding man made and natural structures	Using a bench hook to saw safely and effectively • Exploring cams, learning that different shaped cams produce different follower movements • Exploring types of motions and direction of a motion	Learning how to research a recipe by ingredient • Recording the relevant ingredients and equipment needed for a recipe • Understanding the combinations of food that will complement one another • Understanding where food comes from, describing the process of 'Farm to Fork' for a given ingredient	Learning different decorative stitches • Application and outcome of the individual technique • Sewing accurately with even regularity of stiches	Understanding how electromagnetic motors work • Learning that batteries contain acid, which can be dangerous if they leak • Learning that when electricity enters a magnetic field it can make a motor