

## Design and Technology

### Sequence of Units & core knowledge sequence

			Unit(s)	Focus	<b>Assessment Focus</b> Central substantive knowledge/concepts & application of these
<b>Early Years</b>	<b>Reception</b>	Autumn	<b><u>Expressive Arts and Design</u></b> Early Learning Goal for 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 Make use of props and materials when role playing characters in narratives and stories.		
		Spring			
		Summer			
<b>Key Stage 1</b>	<b>Yr1&amp;2 Cycle A</b>	Autumn	Design Make	<b>Textiles: Puppets</b> Children explore different ways of joining fabrics before creating their own hand puppets based upon characters from a well-known fairy-tale. Throughout they work to develop their technical skills of cutting, gluing, stapling and pinning and sewing.	Use a template to create a design for a puppet Cut fabric neatly with scissors Learn different ways in which to join fabrics together: pinning, stapling, gluing Use joining methods to decorate a puppet Reflect on a finished product, explaining likes and dislikes
		Spring	Design Make Evaluate Technical Knowledge	<b>Mechanisms: Moving Story Book Sliders</b> Children experiment with sliders before planning and making three pages of a moving story book, based on a familiar story. They will draw the page backgrounds, make the moving parts and assemble it.	Design a moving story book for a given audience Learn that levers and sliders are mechanisms and can make things move Follow a design to create moving models that use levers and sliders Test a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed
		Summer	Make Evaluate Cooking and Nutrition	<b>Food: Fruit and Vegetables</b> Children handle and explore fruits and vegetables and learn how to identify which category they fall into, before undertaking taste testing to establish their chosen ingredients for the smoothie they will make a design packaging for	Understand the difference between fruits and vegetables Describe and group fruits by texture and taste Taste and evaluate different food combinations Describe appearance, smell and taste Suggest information to be included on packaging
	<b>Yr1&amp;2 Cycle B</b>	Autumn	Design Make Evaluate	<b>Textiles: Pouches</b> Children learn to sew. By making their own template, children can ensure that their pieces of fabric will be exactly the right size. With their fabric cut out, pupils use a simple running stitch to join two pieces together before decorating the front of it, according to their designs.	Design a pouch Selecting and cut fabrics for sewing Decorate a pouch using fabric glue or running stitch Evaluate the quality of the stitching on others' work Discuss as a class, the success of their stitching against the success criteria Identify aspects of their peers' work that they particularly like and why
		Spring	Design Make Evaluate Technical Knowledge	<b>Structures: Constructing a windmill</b> Inspired by the song, 'Mouse in a windmill', children design, decorate and build a windmill for their mouse client to live in, developing an understanding of different types of windmill, how they work and their key features.	Learn the importance of a clear design criteria Include individual preferences and requirements in a design Make stable structures from card, tape and glue Follow instructions to cut and assemble the supporting structure of a windmill Making functioning turbines and axles which are assembled into a main supporting structure
		Summer	Design Make Evaluate Technical Knowledge	<b>Mechanisms: Wheels and Axles</b> Children learn about the main components of a wheeled vehicle; experiment with mechanisms to help them develop their understanding of how wheels, axles and axle holders work; assume the role of a mechanic to problem-solve why wheels won't rotate; demonstrate learning by designing and building their own moving vehicles.	Design a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move Adapt mechanisms when needed Test mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move Test mechanisms, identifying what stops wheels from turning Identify what mechanism makes a toy or vehicle roll forwards

					Learn that for a wheel to move it must be attached to an axle
<b>Key Stage 2</b>	<b>Yr 3&amp;4 Cycle A</b>	Autumn	Design Make Evaluate	<b>Textiles: Cushions</b> Having already learnt the basics of sewing and decorating fabric in earlier years, this topic offers extra challenge by introducing two new skills to add to their repertoire: cross stitch and appliqué. After learning these techniques, they apply their knowledge to the design, decoration and assembly of their very own cushions	Design and make a template from an existing cushion and applying individual design criteria Follow design criteria to create a cushion Select and cut fabrics with ease using fabric scissors Thread needles with greater independence Tie knots with greater independence Sew cross stitch to join fabric Decorate fabric using appliqué Complete design ideas with stuffing and sewing the edges Evaluate an end product and think of other ways in which to create similar items
		Spring	Design Make Evaluate Technical Knowledge	<b>Mechanical Systems: Slingshot car</b> Children transform lollipop sticks, wheels, dowels and straws into a moving car. They will be using a glue gun to construct the materials, making the launch mechanism, designing and also making the body of the vehicle using nets and assembling these to the chassis	Learn that all moving things have kinetic energy Understand that kinetic energy is the energy that something (object person) has by being in motion Design a shape that reduces air resistance Draw a net to create a structure from Choose shapes that increase or decrease speed as a result of air resistance Measure, mark, cut and assemble with increasing accuracy Describe what characteristics of a design and construction made it the most effective
		Summer	Design Make Evaluate Technical Knowledge	<b>Electrical Systems: Torches</b> In this topic, children apply their scientific understanding of electrical circuits to create a torch made from easily available materials and objects. They will also design and evaluate their product against set design criteria.	Design a torch, considering the target audience and creating both design and success criteria focusing on features of individual design ideas Learn how electrical items work Learn what electrical conductors and insulators are Understand that a battery contains stored electricity and can be used to power products Identify the features of a torch Make a torch with a working electrical circuit and switch Use appropriate equipment to cut and attach materials Assemble a torch according to the design and success criteria Test and evaluate the success of a final product
	<b>Yr 3&amp;4 Cycle B</b>	Autumn	Design Make Evaluate Technical Knowledge	<b>Mechanical Systems: Pneumatic toys</b> In this topic, children apply their scientific understanding of electrical circuits to create a torch made from easily available materials and objects. They will also design and evaluate their product against set design criteria.	Design a toy which uses a pneumatic system Develop design criteria from a design brief Generate ideas using thumbnail sketches and exploded diagrams Learn that different types of drawings are used in design to explain ideas clearly Understand how pneumatic systems work Learn that mechanisms are a system of parts that work together to create motion Understand that pneumatic systems can be used as part of a mechanism Learn that pneumatic systems force air over a distance to create movement Create a pneumatic system to create a desired motion Build secure housing for a pneumatic system Use syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy Select materials due to their functional and aesthetic characteristics Manipulate materials to create different effects by cutting, creasing, folding, weaving

				Test and modifying the outcome, suggesting improvements
	Spring	Design Make Evaluate Technical Knowledge	<b>Structures: Pavilions</b> Pupils explore pavilion structures, learning about what they are used for and investigating how to create strong and stable structures before also designing and creating their own pavilions, complete with cladding.	Design a stable pavilion structure that is aesthetically pleasing and select materials to create a desired effect Learn what pavilions are and their purpose Build on prior knowledge of net structures and broadening knowledge of frame structures Learn that architects consider light, shadow and patterns when designing Implement frame and shell structure knowledge Build frame structures designed to support weight Create a range of different shaped frame structures Make a variety of free-standing frame structures of different shapes and sizes Select appropriate materials to build a strong structure and for the cladding Reinforce corners to strengthen a structure Create a design in accordance with a plan Learn to create different textural effects with materials Describe what characteristics of a design and construction made it the most effective
	Summer	Design Make Evaluate Cooking and Nutrition	<b>Food: Adapting a recipe</b> Children work in groups to adapt a simple biscuit recipe, to create the tastiest biscuit. While making they will also ensure that their creation comes within the given budget of overheads and costs of ingredients	Design a biscuit within a given budget, drawing upon previous taste testing Follow a baking recipe Cook safely, following basic hygiene rules Adapt a recipe Evaluate a recipe, considering: taste, smell, texture and appearance Describe the impact of the budget on the selection of ingredients Understand the environmental impact on future product and cost of production Evaluate and compare a range of products
<b>Yr 5&amp;6 Cycle A</b>	Autumn	Design Make Evaluate Technical Knowledge	<b>Electrical Systems: Steady Hand Game</b> Using their understanding of electrical systems and design, pupils are challenged with designing and creating a steady hand game. Pupils will use nets to create their bases and their knowledge of electrical circuits to build a circuit with a buzzer which closes when the handle contacts the wire frame	Design a steady hand game - identifying and naming the components required Draw a design from three different perspectives Generate ideas through sketching and discussion Model ideas through prototypes Make electromagnetic motors and tweak the motor to improve its function Construct a stable base for an electromagnetic game Accurately cut, fold and assemble a net Make and test a circuit Incorporate a circuit into a base Understand how electromagnetic motors work Learn that batteries contain acid, which can be dangerous if they leak Learn that when electricity enters a magnetic field it can make a motor Test own and others finished games, identifying what went well and making suggestions for improvement
	Spring	Design Make Evaluate Technical Knowledge	<b>Mechanical Systems: Automata Toys</b> Using woodworking materials and skills, pupils construct a window display using an automata mechanism; measuring and cutting their materials, assembling the frame, choosing cams, designing	After experimenting with a range of cams, create a design for an automata toy based on a choice of cam to create a desired movement Understand how linkages change the direction of a force making things move at the same time

				the characters that sit on the followers and also finishing with a foreground and background.	Measure, mark and check the accuracy of the dowel pieces required Measure, mark and cut components accurately using a ruler and scissors Assemble components accurately to make a stable frame Understand that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles Select appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set Evaluating the work of others and receive feedback on own work
	Summer	Design Make Evaluate Technical Knowledge		<b>Structures: Playgrounds</b> This topic draws upon pupils' skills and knowledge of structures, challenging them to design and create a model of a new playground featuring five apparatus, made from three different structures. Creating a footprint as the base, pupils can practise visualising objects in plan view and also get creative with their use of natural features and cladding for their structures	Design a playground featuring a variety of different structures, considering how the structures will be used, considering effective and ineffective designs Build a range of play apparatus structures drawing upon new and prior knowledge of structures Measure, mark and cut wood to create a range of structures Use a range of materials to reinforce and add decoration to structures Know that structures can be strengthened by manipulating materials and shapes Identify the shell structure in everyday life (cars, aeroplanes, tins, cans) Understand man made and natural structures Improve a design plan based on peer evaluation Test and adapt a design to improve it as it is developed Identifying what makes a successful structure
<b>Yr5&amp;6 Cycle B</b>	Autumn	Design Make Evaluate		<b>Textiles: Waistcoats</b> Using the skills they've developed over the past few years, children select fabrics, use templates, pin, decorate and stitch to create a waistcoat for a person or purpose of their choosing	Design a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme Annotate designs Use template pinning panels onto fabric Mark and cut fabric accurately, in accordance with a design Sew a strong running stitch, making small, neat stitches and following the edge Tie strong knots Learn different decorative stitches Sew accurately with even regularity of stitches Decorate a waistcoat - attaching objects using thread and adding a secure fastening Evaluate work continually as it is created
	Spring	Design Make Evaluate Technical Knowledge		<b>Structures: Bridges</b> This topic develops children's understanding of secure structures and introduces them to measuring, sawing and joining wood accurately. After learning about different types of bridges and also exploring how the strength of structures can be affected by the shapes used. Children create their own wooden bridge and test its durability.	Design a structure that is able to support weight Create a frame structure with focus on triangulation Make a range of different shaped beam bridges Use triangles to create truss bridges that span a given distance and supports a load Build a wooden bridge structure Independently measure and mark wood accurately Select appropriate tools and equipment for particular tasks Use the correct techniques to saw safely Explore how to create a strong beam Identify arch and beam bridges and understand the terms: compression and tension Identify stronger and weaker structures Find different ways to reinforce structures

					<p>Understand how triangles can be used to reinforce bridges</p> <p>Articulate the difference between beam, arch, truss and suspension bridges</p> <p>Suggest points for improvements for own bridges and those designed by others</p> <p>Identify where a structure needs reinforcement and use card corners for support</p> <p>Adapt and improve own bridge structure by identifying points of weakness and reinforcing them as necessary</p>
		Summer	<p>Design</p> <p>Make</p> <p>Evaluate</p> <p>Cooking and Nutrition</p>	<p><b>Food:</b></p> <p><b>Come Dine with Me</b></p> <p>Working in groups, children research and prepare a three-course meal taught as a rotational activity over three lessons. They will taste-test and score their food and when they aren't cooking, they will research the journey of their main ingredient from 'farm to fork' or write a favourite recipe to include in a class cookbook.</p>	<p>Write a recipe, explaining the key steps, method and ingredients</p> <p>Include facts and drawings from research undertaken</p> <p>Learn how to research a recipe by ingredient</p> <p>Record relevant ingredients and equipment needed for a recipe</p> <p>Understand the combinations of food that will complement one another</p> <p>Understanding where food comes from, describing the process of 'Farm to Fork' for a given ingredient</p> <p>Evaluate a recipe, considering: taste, smell, texture and origin of the food group</p> <p>Suggest and write up points of improvements in productions</p> <p>Evaluate health and safety in production to minimise cross contamination</p> <p>r</p>