Design Technology Skills and Knowledge Progression map

Key Themes	Developing and evaluating ideas	construction	mechanics	electronics	food technology	textiles
Reception						
Reception Skills/Knowledge	Building from an idea or drawing – understanding making a plan and talking about it	Towers, rows, junk modelling – understanding cause and effect	Understanding cause and effect – pulleys, wheels, levers, scales	Understanding power on and off, effect of switches to make lights come on etc	Understanding hand hygiene. Understanding different types of food. Making choices. Understanding food can be made of other foods – ingredients and finished product	Touch, feel, smell of materials. Understanding that every day objects are made of similar and different materials. Talking about different materials and how they look, feel.

Year 1						
	Developing and evaluating ideas	construction	mechanics	electronics	food technology	textiles
Year 1 Skills/Knowledge	Learning the importance of a clear design criteria. Use templates to create designs. Including individual preferences and requirements in a design. Generate, develop, model and	Making stable structures from card, tape and glue. Understanding unstable constructions will fall down. Describing the purpose of structures e.g bridges, roofs, walls, beams	Creating labelled drawings which illustrate where movement occurs. Identify in everyday objects where movement occurs. Learning that for a wheel to move it must be attached to an axle		Create a recipe from a selection of ingredients to meet a specific brief. Understand that cooking requires particular tools and make judgements about which are most appropriate to a task e.g. spoon or knife	Understand that Fabrics can be joined Together in different ways: pinning, stapling, gluing Experiment with different ways to join fabrics and evaluate the success.

	communicate his/her ideas through talking and drawing. Evaluate this/her own product.	Understanding that some shapes make more stable constructions than others.				

Year 2						
	Developing and evaluating ideas	construction	mechanics	electronics	food technology	textiles
Year 2 Skills/Knowledge	Design purposeful, functional and appealing products based design criteria. Generate, develop, model and communicate their ideas through talking, drawing and mock-ups and where appropriate information communication technology. Select from and use a range of tools and materials to perform practical tasks. Evaluate his/her own product against this/her design criteria. Generating and	Learning about different types of structures, found in the natural world and in everyday objects. Creating joints and structures from paper/card and tape. <u>Technical knowledge:</u> Identifying natural and man-made structures • Identifying when a structure is more or less stable than another • Knowing that shapes and structures with wide, flat bases or legs are the most stable	Creating a class design criteria for a moving card. <u>Technical knowledge</u>: Learning that mechanisms are a collection of moving parts that work together in a machine. • Learning that there is an input and output in a mechanism. • Identifying mechanisms in everyday objects. • Learning that a lever is something that turns on a pivot.		Technical knowledge: • Understanding what makes a balanced diet • Knowing where to find the nutritional information on packaging • Knowing the five food groups	Technical knowledge: **Joining** items using fabric glue or stitching • Identifying benefits of these techniques • Threading a needle • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric

	communicating ideas using sketching and modelling. Confidently explore and evaluate a range of existing products.	• Understanding that the shape of a structure affects its strength • Using the vocabulary: strength, stiffness and stability • Knowing that materials can be manipulated to improve strength and stiffness • Building a strong and stiff structure by folding paper				

Year 3						
	Developing and evaluating ideas	construction	mechanics	electronics	food technology	textiles
Year 3 Skills/Knowledge	Develop skills in choosing a suitable technique to strengthen or repair a product, or create a recipe. Identify a current designer and discuss their influence in a given area. Creating special features for individual designs. Developing design criteria from a	Constructing a range of 3D geometric shapes using nets. Drawing and labelling a_____ design using 2D shapes, labelling: - the 3D shapes that will create the features - materials need and colours. **Technical Knowledge:** Extending the knowledge of wide	Design and include a moving element into a construction using sliders or levers. Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots. • Know and use technical vocabulary relevant to the project.		Develop skills in accurately following a recipe. Creating a healthy and nutritious recipe for _____ using seasonal ingredients, considering the taste, texture, smell and appearance of the dish. Describing the benefits of seasonal fruits and vegetables and	Develop skills and understanding of basic stitching techniques, successfully joining material with stitches. Develop skills and understanding of embellishment and decoration techniques, successfully altering the appearance of a design. Selecting and cutting fabrics with ease using fabric scissors.

	design brief. Generating ideas using thumbnail sketches and exploded diagrams.	and flat based objects are more stable • Understanding the terminology of strut, tie, span, beam. • Understanding the difference between frame and shell structure.			the impact on the environment. Suggesting points for improvement. **Technical knowledge:** Learning that climate affects food growth • Working with cooking equipment safely and hygienically • Learning that vegetables and fruit grow in certain seasons • Learning that each fruit and vegetable gives us nutritional benefits • Learning to use, store and clean a knife safely	Sewing cross stitch to join fabric. Decorating fabric using appliqué. **Technical Knowledge:** Threading needles with greater independence. • Tying knots with greater independence. • Sewing cross stitch and appliqué. • Understanding the need to count the thread on a piece of even weave fabric in each direction to create uniform size and appearance. • Understanding that fabrics can be layered for affect.

Year 4						
	Developing and evaluating ideas	construction	mechanics	electronics	food technology	
Year4 Skills/Knowledge	Show understanding of how a product works by taking it apart and explaining. Develop skills in accurately measuring	Designing a stable shell structure that is aesthetically pleasing and selecting materials to create a desired effect.	Develop an understanding of how the science of forces is used in devices. Technical knowledge: Understanding how pneumatic	Making a torch with a working electrical circuit and switch. Assembling a torch according to the design and success	Develop skills in measuring to the nearest gram, understanding the scale. Develop skills in cutting and heating food safely. Following a baking recipe.	

	materials to the nearest mm. Writing design criteria for a product, articulating decisions made.	Using CAD to produce the design. Building frame structures designed to support weight. Investigating a range of different shaped frame structures. Making a variety of free standing frame structures of different shapes and sizes. Selecting appropriate materials to build a strong structure and for the cladding. Creating a design in accordance with a plan. <u>Technical Knowledge:</u> • Building on prior knowledge of net structures and broadening knowledge of frame structures. • Learning that architects consider light, shadow and	systems work. • Learning that mechanisms are a system of parts that work together to create motion. • Understanding that pneumatic systems can be used as part of a mechanism. • Learning that pneumatic systems force air over a distance to create movement.	criteria and evaluating it against these. <u>Technical Knowledge:</u> • 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.	Cooking safely, following basic hygiene rules. Describing the impact of the budget on the selection of ingredients. Evaluating and comparing a range of products . Describing the impact of the budget on the selection of ingredients. Evaluating and comparing a range of products. Adapting a recipe and evalutating the success. <u>Technical Knowledge:</u> 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.	

		patterns when designing. • Implementing frame and shell structure knowledge. • Considering effective and ineffective designs.				

Year 5						
	Developing and evaluating ideas	construction	mechanics	electronics	food technology	textiles
Year 5 Skills/Knowledge	Develop skills to create products <eg>cutting, drilling, screwing, sawing, gluing, sanding</eg>. Develop skills in taking inspiration from others designers and applying to elements of his/her work. Designing appropriate templates whilst considering proportion.	Designing a stable structure that is able to support weight. Creating frame structure with focus on triangulation. Technical knowledge Finding different ways to make a structure more stable.	Develop skills in applying scientific knowledge of forces to produce a successfully moving mechanism using mechanisms such as levers, pulleys, gears and pneumatics. . Designing a toy vehicle which uses a mixture of structures and mechanisms. Naming each mechanism, input and output accurately. Making mechanisms and/ or structures using gears and pulleys produce		Develop skills in a range of savoury baking techniques. Understand and discuss knowledge of correctly storing and handling ingredients. Identifying and describing healthy benefits of food groups. Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. Cutting and	Develop skills in and successfully use a range of different stitches appropriate to a task. Understand the need for seam allowance in sewing, and apply this effectively. Designing an item of clothing considering the main component shapes required and creating an appropriate template. Technical Knowledge Learning to sew blanket stitch to join fabric • Applying blanket stitch so the space between the

			movement. **Technical Knowledge** Knowing that an input is the motion used to start a mechanism • Knowing that output is the motion that happens as a result of starting the input • Knowing that mechanisms control movement Identifying stronger and weaker structures Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.		preparing vegetables safely. Using equipment safely, including knives, hot pans and hobs. **Technical Knowledge:** Understanding where food comes from. • Understanding what constitutes a balanced diet. • Learning to adapt a recipe to make it healthier.	stitches are even and regular • Threading needles independently

Year 6						
	Developing and evaluating ideas	construction	mechanics	electronics	food technology	
Year 6 Skills/Knowledge	Develop an understanding of the appropriate tool to choose for a specific task.	Designing a playground featuring a variety of different structures, giving careful consideration to how the structures	Experiment with cams to create a moving toy. Technical knowledge	Designing a steady hand game - identifying and naming the components required.	c Show understanding of ratio by scaling a recipe to produce different quantities.	

	Show skills in evaluating his/her work by suggesting improvements to a product. Create designs whilst giving careful consideration to how the structures will be used, considering effective and ineffective designs. Drawing a design from three different perspectives. Generating ideas through sketching and discussion. Modelling ideas through prototypes. Working to a given Timescale. Suggesting and writing up points of improvements in productions. Annotating designs.	will be used, considering effective and ineffective designs. 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 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	Understand that linkages can alter the direction of a force. Knowing that structures can be strengthened by manipulating materials and shapes – and consider this when attaching mechanisms. • Understanding man made and natural structures Technical Knowledge Understand that mechanical systems have an input, process and an output. • Understand how cams can be used to produce different types of movement and change the direction of movement. • Know and	Making electromagnetic motors and tweaking the motor to improve its function. Constructing a stable base for an electromagnetic game Decorating the base of the game to a high quality finish. Incorporating a circuit into a base. Technical Knowledge 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	Evaluating a recipe, considering: taste, smell, texture and origin of the food group. Writing a recipe, explaining the key steps, method and ingredients. Following a recipe, including using the correct quantities of each ingredient. Technical Knowledge: • 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	