



St Luke's CE First School

Design Technology Curriculum Progression of Skills and Knowledge

In our St Luke's family, we recognise we are all God's children and through our caring and nurturing environment, we follow His word. We trust and rely on God's teaching so that we can encourage each other, develop our relationship with God and the world, and flourish in all that we do.

God's word is a lamp to my feet and a light to my path (Psalm 119 v.105)

This document explains how Design and Technology skills and knowledge are developed to support children in reaching the key stage outcomes as outlined in the National curriculum. New learning is weighted toward the start of each key stage, allowing ample opportunity for it to be revisited and applied in later years. As a result, knowledge accumulation may appear heavier in some year groups than others.

At St Luke's, we follow The Kapow Primary Design and Technology curriculum. It aims to inspire children to become curious, creative and innovative thinkers with a broad understanding of how products are designed and made and to 'think like designers and engineers.' The intention is for children to develop the confidence to identify problems, generate ideas, plan and create products and evaluate their outcomes. Kapow Primary's D&T scheme of work has been designed as a spiral curriculum with the following key principles in mind:

- **Cyclical** – pupils return to the key knowledge and skills again and again during their time at St Luke's
- **Increasing depth** – each time a skill is revisited, it is covered with greater complexity
- **Prior knowledge** – pupils build upon previous foundations rather than starting again

EYFS

Design

- Making verbal plans and material choices
- Developing a junk model
- Designing a junk model boat
- Using knowledge from exploration to inform design
- Designing a soup recipe as a class
- Designing soup packaging
- Discussing what a good design needs
- Designing a simple pattern with paper
- Designing a bookmark
- Choosing from available materials

Make

- Improving fine motor/scissor skills with a variety of materials
- Joining materials in a variety of ways (temporary and permanent)
- Joining different materials together
- Describing their junk model, and how they intend to put it together
- Making a boat that floats and is waterproof, considering material choices
- Chopping plasticine safely
- Chopping vegetables with support
- Exploring fine motor/threading and weaving (under, over technique) with a variety of materials
- Using a prepared needle and wool to practise threading

Evaluate

- Giving a verbal evaluation of their own and others' junk models with adult support
- Checking to see if their model matches their plan
- Considering what they would do differently if they were to do it again
- Describing their favourite and least favourite part of their model
- Making predictions about, and evaluating different materials to see if they are waterproof
- Making predictions about, and evaluating existing boats to see which floats best
- Testing their design and reflecting on what could have been done differently
- Investigating how the shape and structure of a boat affect the way it moves
- Tasting the soup and giving opinions
- Describing some of the following when tasting food: look, feel, smell and taste
- Choosing their favourite packaging design and explaining why

Technical Knowledge	Structures • To know there are a range to different materials that can be used to make a model and that they are all slightly different • To know how to make simple suggestions for how to fix their junk model • To know that 'waterproof' materials are those which do not absorb water • To know that some objects float and others sink • To know the different parts of a boat	Cooking and Nutrition • To know that soup is ingredients (usually vegetables and liquid) blended together • To know that vegetables are grown • To recognise and name some common vegetables • To know that different vegetables taste different • To know that eating vegetables is good for us • To discuss why different packages might be used for different foods	Textiles • To know that a design is a way of planning our idea before we start • To know that threading is putting one material through an object
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Year 1

Design	Skills Identifying needs and problems - Thinking about what others might want from a design. - Beginning to recognise how products and designs in the world around us solve certain needs. Developing for a user - Considering who they are designing for - identifying the user. - Stating what they intend to make and why - identifying the purpose. Generating ideas - Talking about ideas, with purpose and user in mind. - Talking about existing products when generating ideas. Communicating ideas - Using basic drawing skills to communicate ideas.	Knowledge Identifying needs and problems - To know that different users may want different things from a design. - To know that the 'user' is the person who will use the product. - To know that designers usually design and make something to solve a problem. Developing for a user - To know that who they are designing for makes a difference to what they design. - To know that the purpose is what something is for. Generating ideas - To know that existing products can help when deciding what to design. Communicating ideas - To know that drawings are a way to explain ideas.
Make	Skills Planning - Planning more than one step ahead. Selecting materials - Choosing between a small number of materials, ingredients or components. - Explaining their choices based on personal experiences. Selecting equipment - Requesting equipment appropriate to the purpose (e.g. scissors for cutting, glue for joining). Tool safety - Explaining in simple terms why certain tools must be handled carefully. - Following and recalling simple safety instructions.	Knowledge Selecting materials - To know that choosing different materials or components will have an effect on what their product does or looks like. Tool safety - To know that some tools are sharp, such as scissors and knives and to know that following instructions means using tools safely. Tool use - Marking and measuring: To know that straight lines, equal spacing and finding the middle of an object help to make products more accurate. - Cutting: To know that different tools and techniques are used to cut materials and soft foods safely and accurately. - Joining: To know that materials can be joined in different ways to create a secure and neat finish. - Shaping: To know that tools are used to change the shape of different materials. - Finishing: To know that texture and careful colouring improve how a product looks and feels.

	Tool use • Marking and measuring: Measuring, marking and spacing materials accurately using simple tools and by identifying midpoints. • Cutting: Cutting straight and spaced lines, larger shapes and simple holes safely and with control. • Joining: Joining materials using glue, tape or simple stitching. • Shaping: Using simple tools to shape materials by cutting and forming. • Finishing: Finishing products using controlled colouring and simple textures.	
Evaluate	Skills Evaluating existing products • Discussing existing products, saying what they like about them. • Comparing two products and discuss which is better for a specific purpose. Evaluating own ideas and products • Discussing how their products could be improved based on personal preferences. • Comparing their finished products with their original designs. Giving and receiving feedback • Saying what they like about their peers' designs and products. • Accepting feedback and understanding it is meant to improve their work.	Knowledge Evaluating existing products • To know that some products will be better than others Evaluating own ideas and products • To know that their ideas or products can be made better. • To know that their final product might be different to their original idea. Giving and receiving feedback • To know that their ideas can make someone else's work better. • To know that other people's ideas can help make their work better.

Technical Knowledge	Textiles Skills • Discussing fabric properties. • Threading large needles. • Rehearsing sewing techniques with large needles and thick thread like wool. • Sewing a running stitch in large-weave embroidery fabric or hessian. • Beginning to sew stitches into a fabric. • Creating patterns and following them with stitching. • Spacing stitches evenly. • Pinning fabric to a template. • Selecting fabric for sewing. • Sewing a running stitch, with evenly spaced, neat, even stitches to join fabric. Knowledge • To know that sewing is a method of joining fabric. • To know that evenly spaced stitches help when following a pattern. • To know that 'joining' means connecting two pieces of material together. • To know that there are various temporary methods of joining fabric by using staples, glue or pins. • To know that a template (or fabric pattern) is used to cut out the same shape multiple times.	Structures Skills • Recognising that different structures are used for different purposes. • Exploring the features of structures. • Describing structures as buildings or freestanding structures. • Making stable structures from card. • Creating supporting structures to aid stability. • Using stable objects, such as cylinders, to create structures. • Building a strong and stiff structure by folding paper. • Folding to strengthen or stiffen. • Comparing the stability of different shapes. • Identifying the weakest part of a structure. Knowledge • To know that a structure is something that has been made and put together. • To understand that the shape of a structure affects its strength. • To know that stable structures do not topple. • To know that shapes and structures with wide, flat bases or legs are the most stable. • To know that adding weight to the base of a structure can make it more stable. • To know that materials can be manipulated to improve strength and stiffness. • To know that a 'strong' structure is one which does not break easily. • To know that a 'stiff' structure or material is one which does not bend easily.	Cooking and Nutrition Skills • Understanding where fruits and vegetables come from. • Chopping fruit and vegetables safely to make a smoothie. • Juicing fruits safely to make a smoothie. • Describing appearance, smell and taste. Knowledge • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables are any edible part of a plant (e.g. potatoes are roots, lettuce is leaves, cucumber is a fruit). • To know that a fruit has seeds. • To know that 'ingredients' means the items in a mixture or recipe. • To know that different foods have different appearance, taste and smell. • To know that kitchen equipment can be used to prepare foods.

Year 2

Design	Skills	Knowledge
Make	Skills Developing for a user - Using a simple design brief that outlines the intended use, target user and key features of the product, to create simple design criteria. Generating ideas - Creating ideas with design criteria in mind. - Referring to specific parts of existing products when generating ideas. Communicating ideas - Making a series of drawings to show how something works. - Using labels to explain parts of a design, label materials etc, including using ICT. - Integrating moving parts when creating mock-ups.	Knowledge Developing for a user - To know that a design brief helps to decide what to make. - To know that design criteria are the steps for making a product successful. Generating ideas - To know that the design criteria help when thinking of ideas. - To know that different products work in different ways and have parts that make them work Communicating ideas - To know that drawings can help explain how something works. - To know that a label explains part of a drawing.
	Skills Planning - Planning more than one step ahead. Selecting materials - Choosing materials, ingredients or components from a wider range of materials, ingredients or components. - Explaining their choices based on the properties of materials and components. Selecting equipment - Selecting from a wider range of equipment some of which are used for the same purpose (e.g. joining by sewing instead of glue). Tool safety - Explaining in simple terms why certain tools must be handled carefully. - Following and recalling simple safety instructions. Tool use - Marking and measuring: Measuring, marking and spacing lines of a given length using simple tools. - Cutting: Cutting a range of materials with improving control by adjusting grip and positioning the material carefully.	Knowledge Planning - To know that a plan is deciding what to do first and next. Selecting materials - To know some properties of materials like hard, soft, flexible, waterproof, strong etc. Selecting equipment - To know that some pieces of equipment are better suited to certain jobs. Tool safety - To know that some tools are sharp like scissors and knives. - To know that following instructions means using tools safely. Tool use - Marking and measuring: To know that length can be measured and marked to improve the accuracy of products. - Cutting: To know that changing grip and how a material is held can make cutting safer and more accurate. - Joining: To know that careful alignment and neat application make a join stronger and tidier.

	- Joining: Joining materials by aligning edges carefully and applying glue or stitches neatly and evenly. - Shaping: Using templates and known shapes to create and adapt forms for a purpose. - Finishing: Applying consistent brush/pen/pencil strokes to create balance in their finishing.		- Shaping: To know that templates and geometric shapes can help create accurate forms that improve how a product works. - Finishing: To know that balanced and consistent finishing improves the overall appearance of their product.	
Evaluate	Skills		Knowledge	
	Evaluating existing products - Discussing a range of existing products and saying what they like and dislike about them. - Comparing a range of products and explaining why some better meet different design criteria than others. Evaluating own ideas and products - Evaluating their ideas and creations against simple design criteria. - Discussing whether they were able to use the tools and techniques effectively. Giving and receiving feedback - Suggesting improvements to their peers’ designs and products.		Evaluating existing products - To know that existing products can be evaluated against design criteria. Evaluating own ideas and products - To know that design criteria help to decide if their product is a success. - To know what different tools and equipment do. Giving and receiving feedback - To know that improve means to make something better. - To know that their suggestions can improve someone else’s work.	
Technical Knowledge	Structures		Cooking and Nutrition	
	Skills	Skills	Mechanisms	
	- Recognising that different structures are used for different purposes. - Exploring the features of structures. - Describing structures as buildings or freestanding structures. - Making stable structures from card. - Creating supporting structures to aid stability. - Using stable objects, such as cylinders, to create structures. - Building a strong and stiff structure by folding paper. - Folding to strengthen or stiffen. - Comparing the stability of different shapes. - Identifying the weakest part of a structure.	- Understanding where fruits and vegetables come from. - Selecting foods to create a balanced recipe. - Selecting foods based on their food group. - Chopping foods safely to make a wrap. - Grating foods. - Snipping smaller foods instead of cutting.	- Recognising and exploring everyday objects that have mechanisms. - Recognising everyday objects that use a slider mechanism (e.g. drawers, sliding doors, a paper trimmer). - Recognising everyday objects that utilise wheels and axles (shopping trolley, car, revolving door). - Recognising that wheels must be able to turn to work effectively. - Exploring everyday objects that use levers (e.g. scissors, tongs, door handle, stapler).	

	Knowledge • To know that a structure is something that has been made and put together. • To understand that the shape of a structure affects its strength. • To know that stable structures do not topple. • To know that shapes and structures with wide, flat bases or legs are the most stable. • To know that adding weight to the base of a structure can make it more stable. • To know that materials can be manipulated to improve strength and stiffness. • To know that a 'strong' structure is one which does not break easily. • To know that a 'stiff' structure or material is one which does not bend easily.	Knowledge • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables are any edible part of a plant (e.g. potatoes are roots, lettuce is leaves, cucumber is a fruit). • To know that 'diet' means the food and drink that a person or animal usually eats. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • To know that a balanced diet is eating foods from different food groups. • To know that a fruit has seeds. • To know that 'ingredients' means the items in a mixture or recipe. • To know that different foods have different appearance, taste and smell. • To know that kitchen equipment can be used to prepare foods.	Knowledge • To know that many moving objects contain internal parts to help them function. • To know that mechanisms usually limit unwanted movement. • To know that a slider mechanism moves an object in a straight line (e.g. left/right, up/down). • To know that sliding mechanisms are designed to keep movement in one direction (e.g. using guides/rails etc). • To know that an axle allows the wheel to turn without falling off. • To know that a pivot is the part that a lever moves around.
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Year 3 and 4

Design	Skills	Knowledge
Make	Skills	Knowledge

Identifying needs and problems - Noticing simple problems or needs in their everyday life. - Using empathy and conducting simple surveys to recognise the needs of others. Developing for a user - Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. Generating ideas - Taking part in structured idea-generation sessions. - Coming up with more ideas and considering the feasibility of their ideas in the classroom. Communicating ideas - Beginning to use 2D CAD software to communicate their ideas. - Developing drawing and sketching skills with a focus on clarity and simplicity. - Developing designs by adding detail and justifications about materials, tools, methods. - Beginning to recognise the benefit of a range of diagram types or prototypes to communicate ideas. (eg. sketches, cross-sectional diagram, thumbnail sketches and exploded diagrams). - Creating prototypes using materials with similar properties to their final design.

Identifying needs and problems - To know that a problem or need is something that a designer can help to solve. Developing for a user - To know that a target audience is a group of people that might like the idea. Generating ideas - To know that thinking together can help generate ideas. - To know that not everything can be made in the classroom. Communicating ideas - To know that CAD is computer-aided design. - To know that CAD can be used to better communicate ideas. - To know that extra information on drawings or diagrams can help the user understand a design or idea. - To know that thumbnail sketches are less detailed quick sketches. - To know that a cross-sectional diagram shows the inside of a product. - To know that an exploded diagram shows how the parts of a product fit together. - To know that a prototype is a detailed model that helps a user understand how a product will work.

Planning - Ordering the main stages of making into a plan. Selecting materials - Selecting materials, components or ingredients from a wider choice but within a limited design space (e.g. seasonal ingredients from May and June in the UK). - Selecting materials, components or ingredients based on their form as well as their functional properties. - Explaining their choices with regard to function and form.
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Planning - To know that ordering the steps of a build can make it easier. Selecting materials - To know that form is the look and shape of something. - To know that function is what something does and how it works. Selecting equipment - To know that different pieces of equipment will be used at different stages in a plan.
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	Selecting equipment - Selecting equipment required for a series of tasks based on the plan. Explain why each piece is suitable for each stage. Tool safety - Suggesting simple safety rules based on their understanding of tool dangers. - Participating in discussions about classroom safety procedures. - Following detailed safety instructions. Tool use - Marking and measuring: Using a ruler accurately to measure and mark straight lines. - Cutting: Cutting more complex shapes and a wider range of materials and foods accurately and safely (e.g. using a bridge or claw hold when chopping foods). - Joining: Joining materials securely by selecting and applying appropriate joining methods for the material and purpose. - Shaping: Creating and refining accurate 2D and 3D shapes to suit the function of a product. - Finishing: Applying precise and varied finishing techniques to enhance appearance and surface quality.	Tool safety - To know that different tools and equipment have different dangers. Tool use - Marking and measuring: To know that a ruler is used to measure and mark length precisely. - Cutting: To know that different tools and techniques are suited to specific materials and levels of resistance. - Joining: To know that stronger and long lasting joins may be needed depending on the materials and how the product will be used. - Shaping: To know that accurate shaping and refining of 2D and 3D forms improves appearance and performance. - Finishing: To know that finishing techniques can improve both the look and performance of a product.
Evaluate	Skills Evaluating existing products - Investigating and analysing a range of existing products by looking at their functionality and appeal. - Analysing why specific products, designers or inventors are successful. Evaluating own ideas and products - Evaluating their designs by comparing them against design criteria and considering feedback from peers to suggest improvements. - Evaluating how effective their chosen materials and tools were in fulfilling the design brief. Giving and receiving feedback - Explaining why they think certain aspects of a peer's design are effective or why they suggested specific improvements. - Reflecting on feedback to decide if and how it could be used to improve future iterations.	Knowledge Evaluating existing products - To know that some products are more successful than other because of their function. - To know that designers and inventors create products. Evaluating own ideas and products - To know that choices of materials and equipment can affect the final product. - To know that feedback is ideas and suggestions from other people that can help improve their work. Giving and receiving feedback - To know that the better the suggestions the better the feedback. - To know that they can choose to use feedback or not.

Technical Knowledge	Mechanisms	Structures	Textiles
	Skills - Beginning to understand how mechanisms work. - Using a series of pivots to create linkages. - Combining levers to create linkages. - Recognising pneumatic systems in everyday objects (e.g. a car boot, an adjustable chair). Knowledge - To understand that a mechanical system can allow us to move something more easily. - To know that mechanical systems have more than one mechanism that moves to make them work. - To know that mechanical systems are often hidden in products to make them look more appealing. - To know that pushing air can be used to move a mechanism. - To know that linkages can be used to create more movement in a mechanical system. - To know that a combination of mechanisms can improve a product. - To know that by using a mechanical system, they can make the car go further. - To know that either the wheels move around the axle or with the axle and the advantages and disadvantages of each.	Skills - Beginning to understand how different structures are built - Constructing a range of 3D shapes. - Stiffening structures. - Strengthening structures by ribbing. - Making a variety of free standing shell structures of different shapes and sizes. Knowledge - To know how a range of structures are built. - To know a shell structure is a hollow shape with a thin outer layer. - To know that 3D shapes can form structures. - To know that structures can be strengthened by manipulating materials and shapes. - To stiffen structures by layering. - To strengthen structures by layering materials (lamination). - To strengthen structures by ribbing.	Skills - Threading needles with greater independence. - Sewing with smaller needles to create smaller stitches. - Selecting similar or different colour thread to hide or show the stitch. - Creating a template. - Sewing cross stitch to decorate or join fabric. - Decorating fabric using appliqué. - Stuffing and sewing to finish a product. - Making and testing a paper template. - Incorporating a fastening to a design. - Sewing using a running stitch. Knowledge - To know that smaller stitches with similar colour thread to the fabric can hide the stitching. - To know that thread of a different colour to the fabric will make the stitch more decorative. - To know that appliqué is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. - To know that when two edges of fabric have been joined together it is called a seam. - To know that it is important to leave space on the fabric for the seam. - To know that some products are turned inside out after sewing so the stitching is hidden. - To know that different fastening types are useful for different purposes. - To know that a fastening is something that holds two pieces of material together.

	Cooking and Nutrition	Electrical Systems	Digital World
	Skills	Skills	Skills
	Knowledge	Knowledge	Knowledge
	- Identifying foods with different nutritional properties. - Recognising the seasonality of foods. - Understanding that many foods are imported from other countries. - Following the instructions within a recipe. - Tasting seasonal ingredients. - Selecting seasonal ingredients. - Peeling ingredients safely. - Cutting safely with a vegetable knife. - Following a baking recipe, including the preparation of ingredients. - Cooking safely, following basic hygiene rules.	- Recognising and exploring everyday electrical products. - Identifying some electrical components. - Using batteries and other electrical components safely. - Creating a working electrical circuit. - Incorporating switches into circuits.	- Beginning to use understanding from computing to control products. - Begin to use a micro:bit as the starting point for a product. - Using code to control button presses. - Using code to sense light. - Using code to monitor time. - Using a micro:bit simulator to test code.
	- To know that not all fruits and vegetables can be grown in the UK and are seasonal - To know that climate affects food growth. - To know that cooking instructions are known as a 'recipe'. - To know that imported food is food which has been brought into the country. - To know that similar coloured fruits and vegetables often have similar nutritional benefits. - To know that the appearance of food is as important as taste. - To know which foods are grown in the UK in a specified season. - To know which foods can be cut and peeled using equipment. - To know that the amount of an ingredient in a recipe is known as the 'quantity.' - To know that safety and hygiene are important when cooking. - To know the following cooking techniques: sieving, measuring, stirring, cutting out and shaping.	- To know that an electrical system is a group of parts (components) that work together to transport electricity around a circuit. - To know some common features of an electric product (e.g. switch, battery, plug, dials, buttons, etc). - To know that a battery contains stored electricity that can be used to power products. - To know that an electrical circuit must be complete for electricity to flow. - To know that a switch can be used to complete and break an electrical circuit.	- To know that creating simple programs can help control products. - To know some features of a micro:bit. - To know that loops and variables can be used in programmable products - To know that a simulator is able to replicate the functions of an existing piece of technology.

