



PROGRESSION OF SKILLS & KNOWLEDGE MAP

ST JOHN FISHER RC PRIMARY SCHOOL



Design and Technology 2023-2024

Design Make Evaluate Technical

SKILLS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
TERM	AUTUMN 1	AUTUMN 2	SUMMER 1	AUTUMN 2		SPRING 2
Structures	<p>Constructing a windmill The importance of a clear design criteria. Include individual preferences and requirements in a design. Make stable structures from card, tape and glue. Turn 2D nets into 3D structures. Follow instructions to cut and assemble the supporting structure of a windmill. Make functioning turbines and axles which are assembled into a main supporting structure. Evaluate a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't. Suggest points for improvements.</p>	<p>Baby bear's chair Generate and communicate ideas using sketching and modelling. Examine different types of structures, found in the natural world and in everyday objects. Make a structure according to design criteria. Create joints and structures from paper/card and tape. Build a strong and stiff structure by folding paper. Explore the features of structures. Compare the stability of different shapes. Test the strength of their own structures. Identify the weakest part of a structure. Evaluate the strength, stiffness and stability of own structure</p>	<p>Constructing a castle Design a castle with key features to appeal to a specific person/purpose. Draw and label a castle using 2D shapes. Design/decorate a castle tower on CAD software. Construct a range of 3D shapes using nets. Create special features for individual designs. Make facades from a range of recycled materials. Evaluate own work and others based on the aesthetic of the finished product and comparison to original design. Suggest points for modification of the individual design.</p>	<p>Pavilions Design a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. 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 cladding. Reinforce corners to strengthen a structure. Create a design in accordance with a plan. Create different textural effects with materials. Evaluate structures made by the class. Describe what characteristics of a design and construction made it the most effective. Consider effective and ineffective designs.</p>		<p>Playgrounds Design a playground featuring a variety of different structures, giving careful consideration to 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 Improve a design plan based on peer evaluation. Test and adapt a design to improve it as it is developed. Identify what makes a successful structure.</p>

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TERM		SPRING 2 AND SUMMER 2		SPRING 2	SPRING 1	
Mechanisms / mechanical systems		<p>Mechanisms: Making a moving monster Create a class design criterion for a moving monster. Design a moving monster for a specific audience in accordance with a design criteria Make linkages using card for levers and split pins for pivots. Experiment with linkages adjusting the widths, lengths and thicknesses of card used. Cut and assemble components neatly Evaluate own designs against design criteria. Use peer feedback to modify a final design</p> <p>Mechanisms: Fairground wheel Select a suitable linkage system to produce the desired motion Design a wheel. Select materials according to their characteristics. Follow a design brief. Evaluate different designs. Test and adapt a design</p>		<p>Making a slingshot car 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. Personalising a design Measure, mark, cut and assemble with increasing accuracy. Make a model based on a chosen design. Evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.</p>	<p>Making a pop-up book Design a pop-up book which uses a mixture of structures and mechanisms. Name each mechanism, input and output accurately. Storyboard ideas for a book. Follow a design brief to make a pop-up book, neatly and with focus on accuracy. Make mechanisms and/or structures using sliders, pivots and folds to produce movement. Use layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result. Evaluate the work of others and receive feedback on their own work. Suggest points for improvement</p>	

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TERM	SUMMER 1		AUTUMN 1		SUMMER 1	
Cooking and nutrition	<p>Fruit and Vegetables Design smoothie carton packaging by-hand or on ICT software. Chop fruit and vegetables safely to make a smoothie. Identify if a food is a fruit or a vegetable. Learn where and how fruits and vegetables grow. Taste and evaluate different food combinations. Describe appearance, smell and taste. Suggest information to be included on packaging.</p>		<p>Eating Seasonally Create a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish. Know how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination. Following the instructions within a recipe. Establish and use design criteria to help test and review dishes. Describe the benefits of seasonal fruits and vegetables and the impact on the environment. Suggest points for improvement when making a seasonal tart</p>		<p>What could be healthier? Adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. Write an amended method for a recipe to incorporate the relevant changes to ingredients. Design appealing packaging to reflect a recipe. Cut and prepare vegetables safely. Use equipment safely, including knives, hot pans and hobs. Know how to avoid cross-contamination. Follow a step-by-step method carefully to make a recipe. Identify the nutritional differences between different products and recipes. Identify and describe healthy benefits of food groups.</p>	

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<u>TERM</u>			<u>SPRING 1</u>	<u>SUMMER 2</u>	<u>AUTUMN 1</u>	<u>SUMMER 2</u>
Digital world Electrical systems			<p>Digital world: Electronic Charm Problem solve by suggesting potential features on a Micro: bit and justifying my ideas. Develop design ideas for a technology pouch. Draw and manipulate 2D shapes, using computer-aided design, to produce a point of sale badge. Use a template when cutting and assembling the pouch. Follow a list of design requirements. Select and use the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch. Apply functional features such as using foam to create soft buttons. Write a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm. Analyse and evaluate an existing product.</p>	<p>Electrical systems: Torches Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. Making a torch with a working electrical circuit and switch. Using appropriate equipment to cut and attach materials. Assembling a torch according to the design and success criteria. Evaluating electrical products. Testing and evaluating the success of a final product.</p>	<p>Digital world: Doodlers Identify factors that could be changed on existing products and explain how these would alter the form and function of the product. Develop design criteria based on findings from investigating existing products. Develop design criteria that clarifies the target user. Alter a product's form and function by tinkering with its configuration. Make a functional series circuit, incorporating a motor. Construct a product with consideration for the design criteria. Break down the construction process into steps so that others can make the product. Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. Determine which parts of a product affect its function and which parts affect its form. Analyse whether changes in configuration positively or</p>	<p>Digital world: Navigating the world Write a design brief from information submitted by a client. Develop design criteria to fulfil the client's request. Consider and suggest additional functions for my navigation tool. Develop a product idea through annotated sketches. Place and manoeuvre 3D objects, using CAD. Change the properties of, or combining one or more 3D objects, using CAD. Consider materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). Explain material choices and why they were chosen as part of a product concept. Programme an N, E, S, W cardinal compass. Explain how my program fits the design criteria and how it would</p>

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			Identify the key features of a pouch.		negatively affect an existing product. Peer evaluate a set of instructions to build a product.	be useful as part of a navigation tool. Develop an awareness of sustainable design. Identify key industries that utilise 3D CAD modelling and explaining why. Describe how the product concept fits the client's request and how it will benefit the customers. Explain the key functions in my program, including any additions. Explain how my program fits the design criteria and how it would be useful as part of a navigation tool. Explain the key functions and features of my navigation tool to the client as part of a product concept pitch. Demonstrate a functional program as part of a product concept pitch

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TERM	SPRING 1					AUTUMN 2
Textiles	<p>Puppets Use a template to create a design for a puppet. Cut fabric neatly with scissors. Use joining methods to decorate a puppet. Sequence the steps taken during construction. Reflect on a finished product, explaining likes and dislikes.</p>					<p>Waistcoats Design a waistcoat in accordance to a specification linked to a set of design criteria. Annotate designs, to explain their decisions. Use a template when cutting fabric to ensure they achieve the correct shape. Use pins effectively to secure a template to fabric without creases or bulges. Mark and cut fabric accurately, in accordance with their design. Sew a strong running stitch, making small, neat stitches and following the edge. Tie string knots. Decorate a waistcoat, attaching features (such as appliqué) using thread. Finish the waistcoat with a secure fastening (such as buttons). Learn different decorative stitches. Sew accurately with evenly spaced, neat stitches. Reflect on their work continually through the design, make and evaluate process.</p>

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KNOWLEDGE	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
TERM	AUTUMN 1	AUTUMN 2	SUMMER 1	AUTUMN 2		SPRING 2
Structures	<p>Constructing a windmill The shape of materials can be changed to improve the strength and stiffness of structures. Cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). Axles are used in structures and mechanisms to make parts turn in a circle. Begin to understand that different structures are used for different purposes. A structure is something that has been made and put together. A client is the person I am designing for. Design criteria is a list of points to ensure the product meets the clients need and wants. A windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. Windmill turbines use wind to turn and make the machines inside work. A windmill is a structure with sails that are moved by the wind.</p>	<p>Baby Bear's chair Shapes and structures with wide, flat bases or legs are the most stable. The shape of a structure affects its strength. Materials can be manipulated to improve strength and stiffness. A structure is something which has been formed or made from parts. A 'stable' structure is one which is firmly fixed and unlikely to change or move. A 'strong' structure is one which does not break easily. A 'stiff' structure or material is one which does not bend easily Natural structures are those found in nature. Man-made structures are those made by people.</p>	<p>Constructing a castle Wide and flat based objects are more stable. Understand the importance of strength and stiffness in structures. Know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. A façade is the front of a structure. A castle needed to be strong and stable to withstand enemy attack. A paper net is a flat 2D shape that can become a 3D shape once assembled. A design specification is a list of success criteria for a product.</p>	<p>Pavilions Understand what a frame structure is. A 'free-standing' structure is one which can stand on its own. A pavilion is a decorative building or structure for leisure activities. Cladding can be applied to structures for different effects. Aesthetics are how a product looks. A product's function means its purpose. The target audience means the person or group of people a product is designed for. Architects consider light, shadow and patterns when designing</p>		<p>Playgrounds Structures can be strengthened by manipulating materials and shapes. A 'footprint plan' is an area of a project site. In the real world, design can impact users in positive and negative ways. A prototype is a cheap model to test a design idea.</p>

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KNOWLEDGE	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
	3 main parts of a windmill are the turbine, axle and structure.					
<u>TERM</u>		<u>SPRING 2 AND SUMMER 2</u>		<u>SPRING 2</u>	<u>SPRING 1</u>	
Mechanisms / mechanical systems		<p><u>Mechanisms: Making a moving monster</u> Mechanisms are a collection of moving parts that work together as a machine to produce movement. There is always an input and output in a mechanism. An input is the energy that is used to start something working. An output is the movement that happens as a result of the input. A lever is something that turns on a pivot. A linkage mechanism is made up of a series of levers. To know some real-life objects that contain mechanisms.</p> <p><u>Mechanisms: Fairground wheel</u> Different materials have different properties and are therefore suitable for different uses.</p>		<p><u>Making a slingshot car</u> All moving things have kinetic energy. Kinetic energy is the energy that something (object/person) has by being in motion. Air resistance is the level of drag on an object as it is forced through the air. The shape of a moving object will affect how it moves due to air resistance. Products change and evolve over time. Aesthetics means how an object or product looks in design and technology. A template is a stencil you can use to help you draw the same shape accurately. A birds-eye view means a view from a high angle (as if a bird in flight). Graphics are images which are designed to explain or advertise something.</p>	<p><u>Pop-up book</u> Mechanisms control movement. Mechanisms can be used to change one kind of motion into another. Sliders, pivots and folds create paper-based mechanisms. A design brief is a description of what I am going to design and make. Designers often want to hide mechanisms to make a product more aesthetically pleasing.</p>	

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KNOWLEDGE	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
		<p>The features of a Ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.</p> <p>It is important to test my design as I go along so that I can solve any problems that may occur.</p>		<p>It is important to assess and evaluate design ideas and models against a list of design criteria.</p>		
<u>TERM</u>	<u>SUMMER 1</u>		<u>AUTUMN 1</u>		<u>SUMMER 1</u>	
Cooking and nutrition	<p><u>Fruit and Vegetables</u> The difference between fruits and vegetables. Some foods typically known as vegetables are actually fruits (e.g. cucumber). A blender is a machine which mixes ingredients together into a smooth liquid. A fruit has seeds and a vegetable does not. Fruits grow on trees or vines. Vegetables can grow either above or below ground. Vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber)</p>		<p><u>Eating Seasonally</u> Not all fruits and vegetables can be grown in the UK. Climate affects food growth. Vegetables and fruit grow in certain seasons. Cooking instructions are known as a 'recipe'. Imported food is food which has been brought into the country. Exported food is food which has been sent to another country. Imported foods travel from far away and this can negatively impact the environment. Each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre. Vitamins, minerals and fibre are important for energy,</p>		<p><u>What could be healthier?</u> Beef is from cattle and how beef is reared and processed, including key welfare issues. They can adapt a recipe to make it healthier by substituting ingredients. I can use a nutritional calculator to see how healthy a food option is. 'Cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.</p>	

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<u>TERM</u>			<u>SPRING 1</u>	<u>SUMMER 2</u>	<u>AUTUMN 1</u>	<u>SUMMER 2</u>
Digital world/ Electrical systems			<p>growth and maintaining health.</p> <p>Safety rules for using, storing and cleaning a knife safely.</p> <p>Similar coloured fruits and vegetables often have similar nutritional benefits.</p>			
			<p><u>Electronic Charm</u> In programming, a 'loop' is code that repeats something again and again until stopped. A Micro: bit is a pocket-sized, codeable computer.</p> <p>The 'Digital Revolution' is a feature of some of the products that have evolved as a result.</p> <p>In Design and technology, the term 'smart' means a programmed product.</p> <p>Know the difference between analogue and digital technologies.</p> <p>Understand what is meant by 'point of sale display.'</p> <p>CAD stands for 'Computer-aided design'.</p>	<p><u>Electrical systems: Torches</u> Electrical conductors are materials which electricity can pass through.</p> <p>Electrical insulators are materials which electricity cannot pass through.</p> <p>A battery contains stored electricity that can be used to power products.</p> <p>An electrical circuit must be complete for electricity to flow.</p> <p>A switch can be used to complete and break an electrical circuit.</p> <p>The features of a torch: case, contacts, batteries, switch, reflector, lamp, lens.</p> <p>Facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison</p>	<p><u>Electrical systems: Doodlers</u> Series circuits only have one direction for the electricity to flow.</p> <p>When there is a break in a series circuit, all components turn off.</p> <p>An electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.</p> <p>A motorised product is one which uses a motor to function.</p> <p>Product analysis is critiquing the strengths and weaknesses of a product.</p> <p>'Configuration' means how the parts of a product are arranged</p>	<p><u>Digital world: Navigating the world</u> Accelerometers can detect movement.</p> <p>Sensors can be useful in products as they mean the product can function without human input.</p> <p>Designers write design briefs and develop design criteria to enable them to fulfil a client's request.</p> <p>'Multifunctional' means an object or product has more than one function.</p> <p>Magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.</p>

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<u>TERM</u>	<u>SPRING 1</u>					<u>AUTUMN 2</u>
Textiles	<p><u>Puppets</u> 'Joining technique' means connecting two pieces of material together. There are various temporary methods of joining fabric by using staples, glue or pins. Different techniques for joining materials can be used for different purposes. A template (or fabric pattern) is used to cut out the same shape multiple times. Drawing a design idea is useful to see how an idea will look</p>					<p><u>Waistcoats</u> It is important to design clothing with the client/ target customer in mind. Using a template (or clothing pattern) helps to accurately mark out a design on fabric. The importance of consistently sized stitches and the impact</p>

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ART & DESIGN – EARLY YEARS Term by Term

RECEPTION

KNOWLEDGE & SKILLS	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
Theme	Getting to know school & each other All About Me	Space Whatever Next	South Pole Lost & Found	A world of difference All Are Welcome	Castles Into the castle	Pirates Portside Pirates
Knowledge taught within theme	Learning how to use and manipulate a variety of tools – scissors, paintbrushes, cutters etc. Painting ourselves Exploring a variety of media – free painting and cutting & sticking, 3D modelling Diwali – Act out story to music Make and decorate clay divas Create Rangoli patterns Home Corner – Pretend Play	Planets using a variety of media Creating rockets – 3D Exploring a variety of media – free painting and cutting & sticking, 3D modelling Space station – pretend play	Create / paint a penguin 2D & 3D Create the (puppet) characters from the story 3D so the children can retell the story Exploring a variety of media – free painting and cutting & sticking, 3D modelling South pole – pretend play	Exploring a variety of media – free painting and cutting & sticking, 3D modelling	Creating trebuchets Creating a drawbridge – pulley system Create their own castles – 3D Exploring a variety of media – free painting and cutting & sticking, 3D modelling Castle – pretend play	Make their own boats (3D) for science experiment – floating and sinking Exploring a variety of media – free painting and cutting & sticking, 3D modelling Pirates – pretend play Portside pirates – song and other sea shanties
Skills taught within theme	<p>Explore, use and refine a variety of artistic effects to express their ideas and feelings.</p> <p>Return to and build on their previous learning, refining ideas and developing their ability to represent them.</p> <p>Create collaboratively, sharing ideas, resources and skills.</p> <p>Make use of props and materials when role playing characters in narratives and stories</p> <p>Develop storylines in their pretend play</p> <p>Use a range of small tools, including scissors, paint brushes and cutlery</p> <p>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form, and function</p> <p>Share their creations, explaining the process they have used</p> <p>Explore the natural world around them, making observations and drawing pictures of animals and plants</p> <p>Begin to show accuracy and care when drawing</p>					

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ART & DESIGN – EARLY YEARS Term by Term

NURSERY

KNOWLEDGE & SKILLS	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
Theme	Starting School & settling In Colours of the Rainbow	Colour & Pattern	Happy & Healthy	Growing	Ourselves & our senses	Journeys Holidays
Knowledge taught within theme	Through stories, learn to differentiate between the colours in a rainbow. Explore the primary colours and then mix colours together to make the secondary colours Painting with different markers-thick, thin, roller, textured roller, fingers, and different methods-splatter, dripping, Layering wet tissue paper to mix colours and collage	Look closely at patterns in our environment and in animals that live in the jungle. Explore camouflage and how colours do/do not stand out clearly on their backgrounds. Printing patterns String painting Learn about the colours of Christmas-shiny, reflective colours and surfaces. Using coloured foil to create an effect	Recreate shape, colours and textures of different vegetables, fruit etc. through close observation of the objects Drawing, painting, collage, moulding dough to respond to key stories-e.g. Handa's fruit basket, Oliver's vegetables, Goldilocks bowl of porridge etc.	Closely observe and recreate the growth of a seed, bean, and caterpillar. Draw, paint, mould, recreate with construction resources	Draw myself, my family Collage 'me'....look closely in the mirror and recreate facial features. Make a 'touch' board. Choose different textures to include. Use junk materials to make a musical instrument Make a telescope Make a megaphone SUSTAINABILITY-Plastic use: 'Turn trash into treasure' Recycle plastic to make musical instruments	Pack a suitcase Draw and cut items to include Design a holiday outfit to dress a stick puppet of myself on holiday Draw a simple map with arrows to show direction
Skills taught within theme	Children differentiate between colours and explore combinations of colour.	Make imaginative 'small worlds' with blocks and construction kits such as cities, towns and parks to develop stories and imagine experiences.	Children join different materials and explore different textures. Children create closed shapes with continuous lines, and begin to use these shapes to represent objects.	Children can draw with increasing complexity. Children develop their own ideas and then decide which materials to use to express them.	Children show different emotions in their drawings-happiness, sadness, fear etc. Children develop their own ideas and then decide which materials to use to express them.	Children can use drawing to represent ideas like movement or loud noises.