Knavesmire Primary School - Curriculum Progression Document

Subject	Design Technology EYFS: Expressive Arts and Design	**Subject leader**	Catherine Hughes
Curriculum resources	KAPOW/ Early Years Development Matters	**Relevant documents**	https://www.kapowprimary.com/subjects/design-technology/

Design Technology	Problem solving through developing ideas, disassembly and design - creating things that are better and evaluating to demonstrate that they can be even better if.
Substantive Knowledge in Design Technology:	By the end of Key Stage Two, children at Knavesmire will be able to: prepare ingredients safely and hygienically and cook nutritious food. They will be able to design their own products using a range of materials, such as wood or plastic and evaluate their product against success criteria. The children will generate their own product ideas by reflecting upon existing products and then developing prototypes. Finally, in order to make successful products, the children will have a secure understanding of mechanical structures, such as: gears, pulley systems and levers.
Disciplinary Knowledge in Design Technology:	Children from Knavesmire will be able to participate fully in an increasingly technological world and have an understanding of how to be critical and reflective consumers. They will be able to use their practical, creative and reflective skills to become consumers and innovators who are well informed and can use their own skills to develop products for the future.

	EYFS **Development Matters: Expressive Arts and Design**					
	Early Learning Goals	**Autumn**	**Spring**	**Summer**	**Enrichment**	
Nursery	Children will: • Join different materials and explore different textures • Develop their own ideas and then decide which materials to use to express them	**Design** • Explore materials and develop ideas about how you might use them **Make** • Design, make, explore and experiment with dough to create forms • Make shapes and structures **Technical Knowledge** • Tear, scrunch and manipulate different materials for a purpose	**Design** • Talk about aims and discuss what is being created **Make** • Create simple collages using found objects e.g. leaves, stick • Start to use a range of tools e.g. scissors, hole punches, cutters **Evaluate** • Evaluate which tools work best when cutting different materials e.g. card vs tissue paper **Technical Knowledge** • Begin to cut different materials confidently e.g. paper, card, tissue paper	**Design** • Talk about aims and discuss what is being created **Make** • Join in with cooking activities, following instructions for hygiene and using safety tools • Begin to join different materials together (temporary and permanent) using different tools e.g. glue, PVA, masking tape, paper clips, peg • Explore how things work **Evaluate** • Revisit and discuss what they might do differently next time when creating a project **Technical Knowledge** • Find out about different joining methods.	• Baking/Cooking • Den-Building • Exhibition for Grown-ups	
Reception	Children will: • Use what they have learnt about media and materials in original ways, thinking about uses and	**Design** • Begin to think about which materials are best suited for a given task	**Design** • Discuss ideas and begin to plan what they would like to make • Use previous knowledge to make	**Design** • Choose and select from a range of media to help them to achieve their goals	• Cooking • Den building • Inviting parents and carers in to look at work	

	purposes • Represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, intended effects. cutting, sticking, mixing colours. texture, form and texture, form and function. .	**Make** • Enjoy exploring with a wide range of 'junk modelling' and natural materials, making simple forms • Tear pieces of material with increasing accuracy and control • Begin to think about which materials are best suited for a given task **Technical Knowledge** • Develop fine and gross motor skills to hold pencils, paintbrushes, scissors, hole punches, staplers and other tools	predictions about which materials will work best for a given task **Make** • Cut different materials with increasing accuracy and control. • Develop an appropriate, safe and correct cutting method **Evaluate** • Evaluate predictions after completing a project	**Make** • Cut and prepare ingredients safely and hygienically • Produce simple dishes without using a heat source • Join different materials together (temporary and permanent) using different tools e.g. glue, PVA, masking tape, paper clips, pegs **Evaluate** • Explain what they have made and why • Evaluate different types of food that they have made **Technical Knowledge** • Use a range of tools and techniques to achieve the desired effect with increasing independence		
	KEY STAGES ONE AND TWO Kapow					
	Structures	**Food and Nutrition**	**Mechanism and Mechanical systems**	**Textiles**	**Navigating the World (KS2 only)**	**Electrical Systems (KS2 Year 4 and 5 only)**
	Skills	**Skills**	**Skills**	**Skills**		**Skills**
Year 1	**Pen Pots** Investigating stable shapes and using an understanding of balance to discover how wide or heavy bases improve stability in freestanding structures **Design** • Learning the importance of a clear design criteria, including individual preferences and user-specific requirements • Exploring existing products and exploring their stability **Make** • Making stable structures from card, masking tape and glue. • Following instructions to cut and join the base to the body, ensuring this is a stable product • Decorating with the intended user in mind **Evaluate** • Evaluating the pen pot according to the design criteria • Testing the stability of the structure is strong and stable and altering it if it isn't • Suggest points for improvements **Technical Knowledge** • Understanding that the shape of materials can be changed to improve the strength and stiffness of structures • Understanding that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).		**Wheels and Axels** Developing an understanding of how wheels, axles and axle holders work **Design** • Designing a pull along toy and beginning to recognise how products and designs in the world around us solve certain needs • Identifying, considering and discussing purpose and the needs of the user • Stating what they intend to make and why and talking about existing products when generating ideas • Using basic drawing skills to communicate ideas **Make** • Planning more than one step ahead • Choosing appropriate materials, ingredients or components and explaining their choices • Following and recalling simple safety instructions and saying why certain tools must be handled carefully • Measuring, marking and spacing materials accurately using simple tools and by identifying midpoints. • Cutting straight and spaced lines, larger shapes and simple holes safely and with control **Evaluate** • Discussing existing products, saying what they like about them. • Comparing two products and discussing which is better for a specific purpose. • Discussing how their products could be improved based on personal preferences	**Simple Stitches** Examining fabrics, practising basic sewing techniques and identifying how different materials are made from threads **Design** • Exploring how fabrics are made and used • Learning how to thread a needle and make basic stitches • Exploring techniques and practising these • Examining existing products • Designing bunting on a template, with user requirements in mind **Make** • Selecting appropriate materials • Following the lines on sketched out designs • Developing stitch sizing/type and fine motor/cutting skills with scissors • Using a prepared needle and wool to practise threading **Evaluate** • Reflecting on a finished product and comparing to their design • Stating what they like about their (and others') finished product and what they would change **Technical Knowledge** • To know that drawings are a way to explain ideas • That different materials or components will affect what the product does or looks like • Names of common pieces of equipment		

	• Starting to recognise that different structures are used for different purposes • Knowing that a structure is something that has been made and put together		• Comparing theirs and peers' finished products with their original designs. • Accepting feedback and understanding it is meant to improve their work **Technical Knowledge** • Recognising and exploring everyday objects that have mechanisms	• Texture is how something feels • Spacing cuts or marks evenly can be useful • Following instructions helps with safety		
Year 2	**Baby Bear's Chair** Investigating strong shapes and the properties of stiff and flexible materials by designing a chair for a bear **Design** • Generating and communicating ideas using sketching and modelling • Learning about different types of structures, found in the natural world and in everyday objects **Make** • Making a structure according to design criteria • Creating joints and structures from paper/card and tape • Building a strong and stiff structure by folding paper **Evaluate** • Exploring the features of structures • Comparing the stability of different shapes • Testing the strength of own structures • Identifying the weakest part of a structure • Evaluating the strength, stiffness and stability of own structure **Technical Knowledge** • To know that shapes and structures with wide, flat bases or legs are the most stable • To understand that the shape of a structure affects its strength • To know that materials can be manipulated to improve strength and stiffness • To know that a structure is something which has been formed or made from parts • To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move • 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	**Balanced Diet** Learning about the importance of a balanced diet and using that knowledge to create a tasty wrap **Design** • Using a simple design brief that outlines intended use, target user and key product features, to create simple design criteria • Creating ideas with design criteria in mind • Referring to specific parts of existing products when generating ideas **Make** • Planning more than one step ahead • Choosing materials, ingredients or components from a wide range and explaining choices based on properties • Selecting from a wider range of equipment • Following and recalling simple safety instructions and explaining careful handing of tools • Adjusting grip and positioning to improve cutting control **Evaluate** • Discussing a range of existing products, saying what they like and dislike • Comparing a range of products and explaining why some better meet different design criteria • Evaluating ideas and creations against simple design criteria. • Discussing effectiveness of tools and techniques used • Suggesting improvements to their peers' designs and products **Technical Knowledge** • Selecting foods to create a balanced recipe/ based on their food group • Describing appearance, smell and taste. • Chopping and rating foods safely • Snipping smaller foods instead of cutting	**Levers** Investigating different types of levers and how they work in everyday mechanisms **Design** • Using design criteria and referring to existing products to generate ideas • Using labels to explain parts of a design/ materials etc, including using ICT. • Integrating moving parts when creating mock-ups **Make** • Integrating moving parts when creating mock-ups • Choosing materials or components from a wider range of materials or components • Choosing between pieces of equipment that are used for the same purpose (e.g. joining) and explaining choices based on components and materials' properties • Following and recalling simple safety instructions **Evaluate** • Comparing a range of products and explaining why some better meet different design criteria than others. • Evaluating ideas and creations against simple design criteria **Technical Knowledge** • Recognising and exploring everyday objects that have mechanisms		

Year 3	**Product Packaging** Exploring how 3D shell structures are created from nets and used in packaging **Design** • Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. • Beginning to use 2D CAD software to communicate ideas **Make** • Creating accurate shapes from templates • Matching shape with product function • Cutting out more complex shapes accurately and using nets to construct 3D geometric shape • Creating individual designs using a range of recycled materials **Evaluate** • Explaining effectiveness of and improvements to peers' designs • Reflecting on feedback and how it could be used to improve future iterations • Investigating and analysing a range of existing products by looking at functionality and appeal **Technical Knowledge** • To understand that wide and flat based objects are more stable • To understand the importance of strength and stiffness in structures			**Egyptian Collars** Linked to our Ancient Egypt bubble, learning how to cross-stitch and appliqué to decorate and assemble Egyptian collars, representing our unique personalities **Design** • Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. • Developing drawing and sketching skills with a focus on clarity and simplicity • Developing designs by adding detail and justifications about materials, tools, methods **Make** • Selecting materials, components or ingredients from a wider choice but within a limited design space, based on form as well as function • Selecting equipment required for a series of tasks based on the plan and explaining why • 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 materials securely by selecting and applying appropriate joining methods for the material and purpose. • Creating and refining accurate 2D and 3D shapes to suit the function of a product • Applying precise and varied finishing techniques to enhance appearance and surface quality **Evaluate** • Evaluating designs by comparing them against design criteria and considering feedback from peers to suggest improvements • Explaining why 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 **Technical Knowledge** • 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. • Sewing using a running stitch	**Wearable Technology** Exploring the development of LEDs and how they have enabled a wide range of light-up wearable technologies **Design** • Problem solving by suggesting which features on a Micro:bit might be useful and justifying ideas • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge • Developing design ideas through annotated sketches to create a product concept. • Developing design criteria to respond to a design brief. **Make** • Following a list of design requirements • Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm **Evaluate** • Analysing and evaluating wearable technology • Using feedback from peers to improve design **Technical Knowledge** • To understand that, in programming, a 'loop' is code that repeats something again and again until stopped • To know that a Micro:bit is a pocket-sized, codeable computer • To know that a simulator is able to replicate the functions of an existing piece of technology	

Year 4		Adapting a Recipe Adapting a basic biscuit recipe by adding or removing ingredients to make it suitable for a target audience **Design** • Noticing simple problems or needs in everyday life • Creating simple design criteria that outline basic functionality and appeal to target audiences • Generating ideas and considering their feasibility Developing designs by adding detail and justifications about materials, tools, methods **Make** • Ordering the main stages of making into a plan • Selecting materials, components or ingredients from a wider choice within a limited design space (e.g. seasonal ingredients from May and June in the UK) • Selecting materials, components or ingredients based on form/ functional properties and explain choices • Selecting task-appropriate equipment • Participating in discussions about classroom safety and suggesting simple safety rules to follow • Choosing shapes to suit the function of a product **Evaluate** • Investigating and analysing the functionality, appeal and success of a range of existing products • Evaluating and comparing their designs against design criteria and considering feedback to improve • Evaluating effectiveness of chosen materials and tools Providing peer feedback **Technical Knowledge** • Following the instructions within a recipe • Following a baking recipe, including the preparation of ingredients • Cooking safely, following basic hygiene rules	Making a Slingshot Car Exploring mechanical systems by building and testing prototype cars to identify effective design features **Design** • Designing a shape that reduces air resistance • Drawing a net to create a structure from • Choosing shapes that increase or decrease speed as a result of air resistance • Personalising a design **Make** • Measuring, marking, cutting and assembling with increasing accuracy • Making a model based on a chosen design **Evaluate** • Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance **Technical Knowledge** • To understand that all moving things have kinetic energy • To understand that kinetic energy is the energy that something (object/person) has by being in motion • To know that air resistance is the level of drag on an object as it is forced through the air • To understand that the shape of a moving object will affect how it moves due to air resistance			Torches Investigating electrical components and circuits and how they are used in everyday products to improve safety and convenience **Design** • Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas **Make** • 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 **Evaluate** • Evaluating electrical products • Testing and evaluating the success of a final product **Technical Knowledge** • To understand that electrical conductors are materials which electricity can pass through • To understand that electrical insulators are materials which electricity cannot pass through • 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

Year 5	. **Bridges** Coming Soon **Design** **Make** **Evaluate** **Technical Knowledge**		**Making a pop up book** Producing a pop up book with a range of mechanisms and structures to illustrate their story and make it interactive for users **Design** • Designing a pop-up book which uses a mixture of structures and mechanisms • Naming each mechanism, input and output accurately • Storyboarding ideas for a book **Make** • Following a design brief to make a pop up book, neatly and with focus on accuracy • Making mechanisms and/or structures using sliders, pivots and folds to produce movement • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result **Evaluate** • Evaluating the work of others and receiving feedback on own work • Suggesting points for improvement **Technical Knowledge** • To know that mechanisms control movement • To understand that mechanisms can be used to change one kind of motion into another • To understand how to use sliders, pivots and folds to create paper-based mechanisms			**Wobblebots/ Doodlers** Building on existing knowledge of circuits by introducing motors and exploring how they create movement in products **Design** • Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product • Developing design criteria based on findings from investigating existing products • Developing design criteria that clarifies the target user **Make** • Altering a product's form and function by tinkering with its configuration • Making a functional series circuit, incorporating a motor • Constructing a product with consideration for the design criteria • Breaking down the construction process into steps so that others can make the product **Evaluate** • Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses • Determining which parts of a product affect its function and which parts affect its form • Analysing whether changes in configuration positively or negatively affect an existing product • Peer evaluating a set of instructions to build a product **Technical Knowledge** • To know that series circuits only have one direction for the electricity to flow • To know when there is a break in a series circuit, all components turn off • To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin • To know a motorised product is one which uses a motor to function

Year 6		Come Dine with Me		Bags	Navigating the world	
		Developing food preparation and evaluation skills by researching and preparing a three-course meal **Design** • Noticing wider-reaching problems or needs in the community • Creating more complex design criteria that require considering detailed user needs, environmental impact, materials and cost • Developing more independence in generating ideas. • Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about their ideas' practicality and originality **Make** • Producing lists of equipment, materials and tools that they need for a task • Creating a step-by-step plan for making • Selecting materials, components or ingredients based on research or user needs • Considering which equipment will work well together • Choosing from the known range of equipment available to them with little guidance • Assessing risks associated with different tools and equipment. • Understanding and explaining the importance of each safety rule • Consistently apply safety instructions • Using appropriate cutting tools and techniques to achieve accurate and aesthetic cuts • Selecting and applying finishes to enhance appearance and protect the product **Evaluate** • Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects • Evaluating the work of a range of designers to help inform their designs • Considering alternative materials, tools or techniques that could enhance the product • Providing feedback that is helpful, specific, and encouraging • Incorporating feedback from peers or users improve their product further, explaining the changes they made and the impact they had **Technical Knowledge** • Recognising that meat is farmed and reared • Cutting and preparing vegetables		Designing pattern pieces, making a bag for a specific user and thinking about aesthetics and functionality **Design** • Designing a bag for a specific user using pattern piece templates • Creating more complex design criteria that require considering detailed user needs, environmental impact, materials and cost • Thinking critically about their ideas' practicality and originality. • Beginning to use more complex annotated sketches, such as cross-sectional and exploded diagrams and pattern pieces in design **Make** • Assessing risks associated with different tools and equipment • Using a ruler to accurately measure and draw lines and marks • Select appropriate scissors to handle delicate cutting tasks e.g. cutting patterns and drawings accurately • Balancing aesthetics and functionality when creating parts of a design • Using nets to create 3D objects • Considering when best to apply finishing effects **Evaluate** • Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects • Evaluating the work of a range of designers to help inform their designs • Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost • Considering alternative materials, tools or techniques that could enhance the product **Technical Knowledge** • Threading needles independently. • Beginning to follow simple patterns or templates that require accurate cutting or measuring • Using pins effectively to secure a template to fabric without creases or bulges • Attaching objects like buttons using thread • Tying strong knots	Designing a product and programming it to function as a compass and a pedometer **Design** • Writing a design brief from information submitted by a client • Developing design criteria to fulfil the client's request • Considering and suggesting additional functions for my navigation tool • Developing a product idea through annotated sketches • Placing and manoeuvring 3D objects, using CAD • Changing the properties of, or combine one or more 3D objects, using CAD **Make** • Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo) • Explaining material choices and why they were chosen as part of a product concept • Programming an N,E, S,W cardinal compass **Evaluate** • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool • Developing an awareness of sustainable design • Identifying key industries that utilise 3D CAD modelling and explain why • Describing how the product concept fits the client's request and how it will benefit the customers • Explaining the key functions in my program, including any additions • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool • Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch • Demonstrating a functional program as part of a product concept **Technical Knowledge** • To know that accelerometers can detect movement • To understand that sensors can be useful in products as they mean the product can function without human input	

		safely ● Using equipment safely, including knives, hot pans and hobs ● Following a step by step method carefully to make a recipe. ● Identifying the flavours of different foods ● Pairing foods based on their flavours				