Woodham Burn Primary School

Design and Technology Curriculum

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At Woodham Burn Primary School, Design and Technology is a practical and inspiring subject that develops pupils' creativity, problem-solving skills, and independence. It encourages children to think critically and work collaboratively to design and make products that meet real needs, considering their own and others' values, wants, and preferences.

Our progressive curriculum ensures that pupils become experts in design and technology, developing the disciplinary skills of designing, making, and evaluating alongside technical knowledge across structures, mechanisms, electrical systems, textiles, digital design, and food technology. Pupils also reflect on how design has shaped society, evaluating innovations from the past and applying these insights to their own work.

We follow the Kapow Primary Scheme, which provides clear progression of knowledge and skills from EYFS to Year 6. Lessons begin with retrieval of key knowledge and vocabulary, and pupils engage in practical projects that link learning to meaningful contexts such as home, leisure, culture, enterprise, and the wider environment.

Pupils' learning is documented and celebrated through displays, digital portfolios, floor books, and Class Dojo updates, allowing children to take pride in their achievements and share their expertise with the school community.

By the end of their Design and Technology journey, pupils at Woodham Burn are confident experts who:

- Design with purpose and evaluate with insight, demonstrating creativity and problem-solving skills.
- Take risks and innovate, becoming resourceful, adaptable, and enterprising thinkers.
- Understand materials, nutrition, and sustainability, appreciating the impact of design on the world and society.

The curriculum is underpinned by broad, recurring concepts that are revisited and reinforced throughout pupils' learning. A strong focus on disciplinary knowledge ensures that pupils learn how to design, create, and evaluate effectively. These components enable pupils to develop and communicate their own ideas, observations, and creations, growing as capable and knowledgeable experts in design and technology.

Curriculum Knowledge and Skills

Design and Technology

Substantive Knowledge Concepts

COOKING AND NUTRITION	TEXTILES	MECHANICAL SYSTEMS	STRUCTURES	DIGITAL WORLD
Knowledge of food, how to prepare it and the principles of a healthy diet.	Knowledge of a range of fabrics and sewing techniques, to make informed choices linked to suitability for product.	Knowledge of varying design and technology mechanisms, including how they built a model or structure with the mechanism, and which tools and products they used to do it. This also includes electrical systems in KS2.	Knowledge of different structures and how they can be stabilised and strengthened. Know a range of finishing techniques that can be used to improve physical appearance.	Knowledge of programming products to perform tasks; developing 2D and 3D designs and models using CAD software. (KS2 only)

Disciplinary Knowledge and Skills
How we 'think' and 'work' like an expert in Design and Technology.

DESIGNING	MAKING	TECHNICAL KNOWLEDGE	EVALUATING AND ANALYSING	FOOD AND NUTRITION
Understanding Contexts, Users and Purposes. Generating, developing, modelling and communicating ideas.	Planning, Practical Skills and Techniques.	Applying their knowledge of specific materials to meet the criteria listed in the design, make and evaluation stages.	Evaluate and analyse a range of existing products and their own designs based on a specific design criteria. Know how key individuals have helped to shape the world in which we live in.	Understand and apply the principles of nutrition and learn how to cook.

	SUBSTANTIVE CONCEPTS				
	COOKING AND NUTRITION	TEXTILES	MECHANICAL SYSTEMS	STRUCTURES	DIGITAL WORLD (KS2)
YEAR 1 - Pull- along Toy			*		
YEAR 1 - Smoothies	*				
YEAR 1 - Puppets		*			
YEAR 2 – A Chair For A Bear				*	
YEAR 2 - Pouches		*			
YEAR 2 – Healthy wraps	*				
YEAR 3 – Prehistoric Monument				*	
YEAR 3 – Pneumatic Toy			*		
YEAR 3 - Cushions		*			
YEAR 4 - Torches			*		
YEAR 4 - Alternative Biscuits	*				
YEAR 4 – Mindful Moments Timer					*
YEAR 5 - Stuffed Toy		*			
YEAR 5 – Pop Up Book			*		
YEAR 5 - Create Healthier Bolognese	*				
YEAR 6 - Electronic Greetings Card			*		
YEAR 6 - Playgrounds				*	
YEAR 6 – Navigating the World					*

	Kapow Primary Design and Technology at Woodham Burn			
	Autumn	**Spring**	**Summer**	
EYFS Foundations for DT	**Reception: All Change** **Structures** Construct large scale models of the school and its surrounding area using a range of materials **Reception- Materials Around Us** Design and create Christmas decorations	**Nursery: On the farm** **Cooking and Nutrition** Food production **Reception: Terrific Transport Mechanisms** Design a vehicle with different features that they have chosen.	**Nursery: In the Garden** **Structures** Making a bird feeder **Nursery: Let's get physical** Cooking and Nutrition **Reception: Once Upon a Time** **Structures** Make large scale 3D models by combining small 3d models together	
Year 1	**Mechanical Systems** Wheels and Axels: Pull- along Toy	**Cooking and Nutrition** Smoothies	**Textiles** Puppets	
Year 2	**Structures** A Chair for a Bear	**Textiles** Pouches	**Cooking and Nutrition** Wraps	
Year 3	**Structures** Constructing a Prehistoric Monument	**Mechanical Systems** Pneumatic Toys	**Textiles** Cushions	
Year 4	**Electrical Systems** Torches	**Cooking and Nutrition** Adapting a Recipe	**Digital World** Mindful Moments Timer	
Year 5	**Textiles** Stuffed Toys	**Mechanical Systems** Pop Up Book	**Cooking and Nutrition** What could be healthier?	
Year 6	**Electrical Systems** Electronic Greetings Card		**Structures** Playgrounds	**Digital World** Navigating the World

Progression of Knowledge and Skills

Design and Technology Curriculum

Progression Map: Structures

		Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Disciplinary Skills Knowledge	Design	• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through talking, mock-ups and drawings. • Learning about different types of structures, found in the natural world and in everyday objects. **EXTEND** • Generating and communicating ideas using sketching and modelling.	• Designing a monument with key features to appeal to a specific person/purpose • Drawing and labelling a monument design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours • Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product. **EXTEND** • Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas. • Designing and/or decorating a monument on CAD software	• Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs • Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches. • Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. **EXTEND** • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.
	Make	• Select and use tools, skills and techniques, explaining their choices. • Select new and reclaimed materials and construction kits to build their structures. • Use simple finishing techniques suitable for the structure they are creating. **EXTEND** • 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	• Constructing a range of 3D geometric shapes using nets • Creating special features for individual designs • Making facades from a range of recycled materials **EXTEND** • Order the main stages of making. • Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with greater accuracy. • Explain their choice of materials according to functional properties and aesthetic qualities. • Use computer-generated finishing techniques suitable for the product they are creating.	• Building a range of play apparatus structures drawing upon new and prior knowledge of structures • Measuring, marking and cutting materials to create a range of structures • Using a range of materials to reinforce and add decoration to structures. • **EXTEND**. • Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. • Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. • Use finishing and decorative techniques suitable for the product they are designing and making.

	Evaluate	• Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings. • Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria. • Exploring the features of structures • Comparing the stability of different shapes • Testing the strength of own structures **EXTEND**. • Identifying the weakest part of a structure • Evaluating the strength, stiffness and stability of own structure.	• Investigate and evaluate a range of existing structures including the materials, components and techniques that have been used. • Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison, to the original design. **EXTEND**. • Test and evaluate their own products against design criteria and the intended user and purpose. • Suggest points for modification of the individual designs.	• Improving a design plan based on peer evaluation • Testing and adapting a design to improve it as it is developed • Identifying what makes a successful structure. • Investigate and evaluate a range of existing frame structures. • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. **EXTEND**. • Research key events and individuals relevant to frame structures.
Technical Skills Knowledge for Structures		• **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** • To understand that the shape of a structure affects its strength **EXTEND** • To know that shapes and structures with wide, flat bases or legs are the most stable • 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 understand that wide and flat based objects are more stable** • **To understand the importance of strength and stiffness in structures** **EXTEND** • Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes –using CAD design to improve the precision of design.	• **To know that structures can be strengthened by manipulating materials** • **To know that structures can be strengthened by manipulating shapes** **EXTEND** • Understand how to strengthen, stiffen and reinforce 3-D frameworks.
Vocabulary	• Client • Design • Evaluation • Function • Man-made • Mould • Natural • Net • Stable • Strong • Structure • Test • Weak	• 2D shapes • 3D shapes • Aesthetic • Monument • Design criteria • Evaluate • Facade • Feature • Flag • Net • Recyclable • Scoring • Stable • Strong • Structure • Tab • Weak	• Adapt • Apparatus • Design • Evaluation • Feedback • Idea • Landscape • Mark out • Measure • Modify • Natural materials • Plan view • Playground • Prototype • Reinforce • Sketch • Strong • Structure • Texture • User

Progression Map: Mechanisms/ Mechanical Systems

		Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Disciplinary Skills Knowledge	**Design**	• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through talking, mock-ups and drawings. **EXTEND** • Explaining how to adapt mechanisms.	• Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product. • Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas. **EXTEND** • Designing a toy which uses a pneumatic system • Developing design criteria from a design brief • Generating ideas using thumbnail sketches and exploded diagrams • Learning that different types of drawings are used in design to explain ideas clearly	• Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement • Understanding how linkages change the direction of a force • Making things move at the same time • Understanding and drawing cross-sectional diagrams to show the inner-working • Develop a simple design specification to guide their thinking. **EXTEND** • Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • •Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.
	Make	• Plan by suggesting what to do next. • Following a design to create moving models. • Select and use tools, skills and techniques, explaining their choices. **EXTEND** • Select new and reclaimed materials and construction kits to build their structures. • Use simple finishing techniques suitable for the structure they are creating.	• Order the main stages of making. • Creating a pneumatic system to create a desired motion • Building secure housing for a pneumatic system • Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy **EXTEND** • Selecting materials due to their functional and aesthetic characteristics • Manipulating materials to create different effects by cutting, creasing, folding, weaving • Use finishing techniques suitable for the product they are creating.	• Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost. **EXTEND** • Measuring, marking and checking the accuracy of the jelutong and dowel pieces required • Measuring, marking and cutting components accurately using a ruler and scissors • Assembling components accurately to make a stable frame • Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles • Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set

	Evaluate	• Explore a range of existing and everyday products that use the mechanism • Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria **EXTEND** • Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed • Reviewing the success of a product by testing it with its intended audience	• Investigate and evaluate a range of existing products including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose. **EXTEND** • Using the views of others to improve designs • Testing and modifying the outcome, suggesting improvements • Understanding the purpose of exploded diagrams through the eyes of a designer and their client	• Compare the final product to the original design specification. • Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. **EXTEND** • Evaluating the work of others and receiving feedback on own work • Applying points of improvements • Describing changes, they would make/do if they were to do the project again
Technical Skills Knowledge for Mechanisms/ Mechanical Systems		• **Understand that different mechanisms produce different types of movement.** • **To know that a mechanism is the parts of an object that move together** **EXTEND** • Recognising and exploring everyday objects that have mechanisms- beyond classroom learning.	• **To understand how pneumatic systems work** • **To know that pneumatic systems operate by drawing in, releasing and compressing air** **EXTEND** • To understand that pneumatic systems can be used as part of a mechanism • Develop and use knowledge of how to construct strong, stiff structures. • Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. • Know and use technical vocabulary relevant to the project.	• **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.** **EXTEND** • To understand that the mechanism in an automata uses a system of cams, axles and followers • To understand that different shaped cams produce different outputs
Vocabulary		• Assemble • Design • Evaluation • Mechanism • Stencil • Target audience • Template • Test	• Exploded diagram • Function • Input • Lever • Linkage • Mechanism • Motion • Net • Output • Pivot • Pneumatic system • Thumbnail sketch	• Follower • Frame • Function • Hand drill • Jelutong • Linkage • Mark out • Measure • Mechanism • Model • Research • Right-angle • Set square • Tenon saw

Progression Map: Cooking and Nutrition

There are 4 Strands in Key Stage 1 therefore Textiles and Food & Nutrition are repeated in each cycle.

		Key Stage 1 – Y1	Key Stage 1 – Y2	Lower Key Stage 2	Upper Key Stage 2
Disciplinary Skills Knowledge	Design	• Designing smoothie carton packaging by-hand. • Learning where and how fruits and vegetables grow.	• Designing three wrap ideas.	• Designing a product within a given budget, drawing upon previous taste testing. • Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose. • Use annotated sketches to develop and communicate ideas.	• Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients • Writing an amended method for a recipe to incorporate the relevant changes to ingredients • Designing appealing packaging to reflect a recipe. • Explore a range of initial ideas and make design decisions to develop a final product linked to user and purpose.
	Make	• Chopping fruit and vegetables safely to make a smoothie. • Juicing fruits safely to make a smoothie. • Identifying if a food is a fruit.	• Chopping foods safely to make a wrap. • Constructing a wrap that meets a design brief. • Grating foods to make a wrap. • Snipping smaller foods instead of cutting. • Spreading soft foods to make a wrap. • Identifying the five food groups. • Learning about balanced diet.	• Following a baking recipe • Cooking safely, following basic hygiene rules • Adapting a recipe **EXTEND** • Plan the main stages of a recipe, listing ingredients, utensils, equipment and timings.	• Following a recipe, including using the correct quantities of each ingredient • Adapting a recipe based on research • Working to a given timescale • Working safely and hygienically with independence **EXTEND** • Write a step-by-step recipe, including a list of ingredients, equipment and utensils • Make, decorate and present the food product appropriately for the intended user and purpose.
	Evaluate	• Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Suggesting information to be included on packaging. • Comparing their own smoothie with someone else's.	• Describing appearance, smell and taste. • Taste and evaluating different food combinations. • Describing the information that should be included on a • label.	• Evaluating a recipe, considering taste, smell, texture and appearance • Describing the impact of the budget on the selection of ingredients • Evaluating and comparing a range of products • Suggesting modifications **EXTEND** • Carry out sensory evaluations of a variety of ingredients and products. • Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.	• Evaluating a recipe, considering taste, smell, texture and origin of the food group • Taste testing and scoring final products • Suggesting and writing up points of improvements in productions • Evaluating health and safety in production to minimise cross contamination **EXTEND** • Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams. • Evaluate the final product with reference back to the design brief and design specification, considering the views of others when identifying improvements.

				• Understand how key chefs have influenced eating habits to promote varied and healthy diets.
Technical Skills Knowledge for Cooking and Nutrition	• **To know that some fruits have seeds and a vegetable does not.** • **To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber)** • To know that fruits grow on trees or vines • To know that vegetables can grow either above or below ground **EXTEND** • To know that nutrients are substances in food that all living things need to make energy, grow and develop • To know that 'ingredients' means the items in a mixture or recipe	• **To know that 'diet' means the food and drink that a person or animal usually eats** • **To understand what makes a balanced diet** • **To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar** • To know where to find the nutritional information on packaging **EXTEND** • To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy • To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars' • To understand that I should eat a range of different foods from each food group, and roughly how much of each food group.	• **To know that the amount of an ingredient in a recipe is known as the 'quantity'** • **To know that it is important to use oven gloves when removing hot food from an oven** • **To know the following cooking techniques: sieving, creaming, rubbing method, cooling** • To understand the importance of budgeting while planning ingredients for biscuits **EXTEND** • Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.	• **To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues** • **To know that I can adapt a recipe to make it healthier by substituting ingredients** • To understand that 'cross-contamination' means that bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects **EXTEND** • To know that I can use a nutritional calculator to see how healthy a food option is. • Understand about seasonality in relation to food products and the source of different food products.
Vocabulary	• Blender • Carton • Fruit • Healthy • Ingredients • Peel • Peeler • Recipe • Slice • Smoothie • Stencil • Template • Vegetable	• Alternative • Diet • Balanced diet • Evaluation • Expensive • Healthy • Ingredients • Nutrients • Packaging • Refrigerator • Sugar • Substitute	• Adapt • Budget • Cooling rack • Creaming • Flavour • Ingredients • Method • Net • Packaging • Prototype • Quantity • Recipe • Rubbing • Sieving • Target audience • Unit of measurement • Utilities	• Beef • Cross-contamination • Diet • Ethical issues • Farm • Healthy • Ingredients • Method • Nutrients • Packaging • Reared • Recipe • Research • Substitute • Supermarket • Vegan • Vegetarian • Welfare

Progression Map: Textiles

There are 4 Strands in Key Stage 1 therefore Textiles and Food & Nutrition are repeated in each cycle.

		Key Stage 1- YR1	Key Stage 1- YR2	Lower Key Stage 2	Upper Key Stage 2
Disciplinary Skills Knowledge	Design	• Using a template to create a design for a puppet **EXTEND** • Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups	• Learning the importance of a clear design criterion. • Discussing what a good design needs. • Designing a simple pattern with paper. • Choosing from available materials. **EXTEND** Including individual preferences and requirements in a design.	• Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s. • Writing design criteria for a product, articulating decisions made **EXTEND** • Produce annotated sketches, prototypes, final product sketches and pattern pieces.	• Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification. • Designing a stuffed toy considering the main component shapes required and creating an appropriate template. **EXTEND** • Generate innovative ideas by carrying out research including surveys, interviews and questionnaires. • Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer aided design.
	Make	• Cutting fabric neatly with scissors • Using joining methods to decorate a puppet • Sequencing steps for construction **EXTEND** • Select from and use textiles according to their characteristics. • Understand how to join fabrics using a running stitch • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.	• Selecting and cutting fabrics for sewing. • Decorating a pouch using fabric glue or running stitch. • Threading a needle. • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. • Cutting fabric using a template. **EXTEND** • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. • Neatly pinning and cutting fabric using a template.	• Plan the main stages of making. • Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing. • Select fabrics according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern. • Incorporating a fastening. • neatly sewing small, neat stitches **EXTEND** • Making and testing a paper template with accuracy and in keeping with the design criteria • Measuring, marking and cutting fabric using a paper template • Selecting a stitch style to join fabric, working neatly sewing small, neat stitches • Incorporating a fastening to a design according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.	• Creating a 3D stuffed toy from a 2D design. • Measuring, marking and cutting fabric accurately and independently. • Creating strong and secure blanket stitches when joining fabric. • Threading needles independently • Using a blanket stitch to join fabric. **EXTEND** • Produce detailed lists of equipment and fabrics relevant to their tasks. • Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. • Applying blanket stitch so the space between the stitches is even and regular. • Using appliqué to attach pieces of fabric decoration.

	Evaluate	• Reflecting on a finished product, explaining likes and dislikes **EXTEND** • Explore and evaluate a range of existing textile products relevant to the project being undertaken. • Evaluate their ideas throughout and their final products against original design criteria.	• Troubleshooting scenarios posed by teacher. • Discussing as a class, the success of their stitching against the success criteria. • Identifying aspects of their peers' work that they particularly like and why. **EXTEND** • Troubleshooting scenarios independently. • Evaluating the quality of the stitching on others' work.	• Investigate a range of 3-D textile products relevant to the project. • Test their product against the original design criteria and with the intended user. • Take into account others' views. **EXTEND** • Testing and evaluating an end product against the original design criteria. • Deciding how many of the criteria should be met for the product to be considered successful. • Suggesting modifications for improvement. • Articulating the advantages and disadvantages of different fastening types.	• Testing and evaluating an end product and giving point for further improvements. • Compare the final product to the original design specification. **EXTEND** • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.
Technical Skills Knowledge for Textiles		• **To know that 'joining technique' means connecting two pieces of material together.** • **To understand that different techniques for joining materials can be used for different purposes.** • **To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.** • To know that there are various temporary methods of joining fabric by using staples, glue or pins. • To know that drawing a design idea is useful to see how an idea will look. • Know and use technical vocabulary relevant to the project. **EXTEND** • Understand how to join fabrics using a running stitch • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.	• **To know that sewing is a method of joining fabric.** • **To understand the importance of tying a knot after sewing the final stitch** • To know that a thimble can be used to protect my fingers when sewing **EXTEND** • To know that different stitches can be used when sewing- blanket stitch and hemming stitch	• **To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and Velcro.** • **Understand how to securely join two pieces of fabric together** • Know and use technical vocabulary relevant to the project. **EXTEND** • To know that different fastening types are useful for different purposes • To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions • Understand the need for patterns and seam allowances.	• **To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric.** • **To know that soft toys are often made by creating appendages separately and then attaching them to the main body.** • To understand that it is easier to finish simpler designs to a high standard. **EXTEND** • A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. • To know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely

Vocabulary	• Decorate • Design • Fabric • Glue • Model • Hand puppet • Safety pin • Staple • Stencil • Template	• Design • Equipment • Inspiration • Method • Safety pin • Technique • Template • Running stitch	• Aesthetic • Assemble • Book sleeve • Design criteria • Evaluation • Fabric • Fastening • Mock-up • Net • Running stitch • Stencil • Target audience • Target customer • Template	• Accurate • Annotate • Appendage • Blanket-stitch • Design criteria • Detail • Evaluation • Fabric • Sew • Shape • Stuffed toy • Stuffing • Template

Progression Map: Electrical Systems

Not Applicable to EYFS/KS1

		Lower Key Stage 2	Upper Key Stage 2
Disciplinary Skills Knowledge	Design	• Carry out research based on a given topic (elated to Science) to develop a range of initial ideas • Generate a final design for the electric poster with consideration to the client's needs and design criteria • Design an electric poster that fits the requirements of a given brief • Plan the positioning of the bulb (circuit component) and its purpose **EXTEND** • Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product. • Use annotated sketches and prototypes to model and communicate ideas.	• Designing an electronic greetings card with a copper track circuit and components • Creating a labelled circuit diagram showing positive and negative parts in relation to the LED and the battery. • Writing design criteria for an electronic greeting card • Compiling a mood board relevant to my chosen theme, purpose and recipient. **EXTEND** • Develop a design specification for a functional product that responds automatically to changes in the environment. • Generate, develop and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams.
	Make	• Create a final design for the electric poster • Mount the poster onto corrugated card to improve its strength and withstand the weight of the circuit on the rear • Measure and mark materials out using a template or ruler • Fit an electrical component (bulb) • Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge) **EXTEND** • Order the main stages of making. • Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy. • Explain their choice of materials according to functional properties and aesthetic qualities.	• Making a functional series circuit • Creating an electronic greeting card, referring to a design criteria • Mapping out where different components of the circuit will go **EXTEND** • Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. • Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product.
	Evaluate	• Learning to give and accept constructive criticism on own work and the work of others • Testing the success of initial ideas against the design criteria and justifying opinions • Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs **EXTEND** • Investigate and evaluate a range of existing structures including the materials, components and techniques that have been used. •Evaluate their own products against design criteria and the intended user and purpose.	• Evaluating a peer's product against design criteria and suggesting modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of circuit component • Stating what Sir Rowland Hill invented and why it was important for greeting cards • Analysing and evaluating a range of existing greeting cards **EXTEND** • Continually evaluate and modify the working features of the product to match the initial design specification. • Test the system to demonstrate its effectiveness for the intended user and purpose.

Technical Skills Knowledge for Electrical Systems	• **To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit** • **To understand common features of an electric product (switch, battery or plug, dials, buttons etc.)** • **To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits** • **To list examples of common electric products (kettle, remote control etc.)** • **To understand that an electric product uses an electrical system to work (function)** **EXTEND** • Develop and use knowledge of how to construct strong, structures. • To know that copper is a conductor and can be used as part of a circuit • To understand that breaks in a circuit will stop it from working	• **To know the key components used to create a functioning circuit** • **To know that copper is a conductor and can be used as part of a circuit** • **To understand that breaks in a circuit will stop it from working** • **To understand that a series circuit only has one path for the electrical current to flow from positive to negative** • **To know that we use symbols to represent components in a circuit diagram** **EXTEND** • Apply their understanding of computing to program, monitor and control their products.
Vocabulary	• Battery • Bulb • Buzzer • Cell • Component • Conductor • Copper • Design criteria • Electrical item • Electricity • Electronic item • Function • Insulator • Series circuit • Switch • Test • Wire	• Battery • Buzzer • Circuit • Coin cell battery • Component • Conductor • Copper • Design • Design criteria • Function • Innovative • Insulator • LED • Modify • Series circuit • Switch • Target audience • Test • Wire

Progression Map: Digital World

Not Applicable to EYFS/KS1

		Lower Key Stage 2	Upper Key Stage 2
Disciplinary Skills Knowledge	Design	• Problem solving by suggesting potential features on a Micro: bit and justifying my ideas • Developing design ideas for a technology pouch • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge **EXTEND** • Applying the results of my research to further inform my design criteria. • Developing a prototype. • Following a list of design requirements.	• Researching (books, internet) for a particular (user's) animal's needs • Developing design criteria based on research • Generating multiple housing ideas using building bricks • Understanding what a virtual model is and the pros and cons of traditional and CAD modelling • Placing and manoeuvring 3D objects, using CAD • Changing the properties of, or combine one or more 3D objects, using CAD **EXTEND** • Placing and manoeuvring 3D objects, using CAD • Changing the properties of, or combine one or more 3D objects, using CAD
	Make	• Using a template when cutting and assembling the pouch • Following a list of design requirements • Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch **EXTEND** • Applying functional features such as using foam to create soft buttons	• Understanding the functional and aesthetic properties of plastics • Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range **EXTEND** • 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
	Evaluate	• Analysing and evaluating an existing product • Identifying the key features of a pouch • Investigating and analysing a range of products by identifying and comparing their advantages and disadvantages. **EXTEND** • Evaluating my Micro:bit program against points on my design criteria and amending them to include any changes I made. • Documenting and evaluating my project.	• Explaining key functions in my program (audible alert, visuals) • Explaining how my product would be useful for an animal carer including programmed features • 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 • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool **EXTEND** • 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
Technical Skills 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** • **Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm** • To know some of the features of a Micro:bit.	• **To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record** • **To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose** • **To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met**

	EXTEND • To understand what variables are in programming. • To know that an algorithm is a set of instructions to be followed by the computer. • To know that it is important to check my code for errors (bugs). • To know that a simulator can be used as a way of checking your code works before installing it onto an electronic device.	**EXTEND** • 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
Vocabulary	• Analogue ● Badge ● CAD ● Control ● Design requirements ● Develop ● Digital ● Digital revolution ● Digital world ● Display ● Electronic ● Electronic products ● Fasten ● Feature ● Function ● Initiate ● Key features ● Layers ● Loops ● Micro: bit Monitor ● Net ● Point of sale ● Product ● Product design ● Program ● Sense ● Simulator ● Smart wearables ● Stand ● Technology ● Template ● Test ● User	• Alert ● Ambient ● Boolean ● Consumables ● Decompose ● Development ● Device ● Duplicate ● Durable ● Electronic ● Inventor ● Lightweight ● Man-made ● Manipulate ● Manoeuvre ● Microplastics ● Model ● Monitor ● Monitoring device ● Moulded Plastic ● Plastic pollution ● Programming comment ● Programming loop ● Reformed ● Replica ● Research ● Sensor ● Strong ● Sustainability ● Synthetic ● Thermometer ● Thermoscope ● Value ● Variable ● Versatile ● Water-resistant

EYFS – Year 6 Topics of Learning

Design and Technology Curriculum

Early Years Foundations of Learning

Design Technology is ultimately about people and making things better for people. Our children think about how a range of everyday and less familiar products are used in places such as schools and homes. They are given time to explore existing products available on the market and evaluate them through discussions and hands on experiences. During the designing process, it does not necessarily entail drawing but can include hand gestures, arranging and re-arranging materials and components, talking and listening. After they have made a product, children explain how their own and others' products work and that purposes they fulfil.

Design Technology opportunities are planned into our curriculum, however, as part of our continuous provision, children are designing, trialling, creating and evaluating all of the time – be it in a construction area with a range of building blocks, in the junk modelling area, at the creation station or outside with the large loose parts.

Throughout Nursery and Reception, children will also have regular access to our teaching kitchen; understanding the importance of food hygiene and applying the principles of nutrition and healthy eating. Instilling a love of cooking in our children will also open a door to one of the great expressions of human creativity.

We deliver a curriculum based on the Early Years Foundation Stage Framework. The most relevant statements for Design Technology are taken from the following areas of learning:

- Physical Development
- Expressive Arts and Design

Supporting Our Children	
Physical Development **Fine Motor Skills**	• Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks and spoons. • Suggested activities: threading and sewing, woodwork, pouring, stirring, making models with junk materials, construction kits and malleable materials like clay. • We regularly review the equipment for children to develop their small motor skills, ensuring it is appropriate for the different levels of skill and confidence of children in the class.
Expressive Arts and Design **Creating with Materials**	• We teach children different techniques for joining materials, such as how to use adhesive tape and different sorts of glue. • We provide a range of materials and tools and teach children to use them with care and precision. • We provide opportunities for shared learning and collaboration as well as promote independence, taking care not to introduce too many new things at once.

	Nursery End Goals related to Design Technology that we wish to develop	Reception End Goals related to Design Technology that we wish to develop
Physical Development **Fine Motor Skills**	• Manipulate a range of tools and equipment in one hand, e.g. paint brushes, scissors or ribbons • Hold equipment/tools consistently in the same hand, e.g., pencil, paint brush, glue spreader. • Hold a pencil consistently in the same hand using a tripod grip for mark making, name writing, drawing etc. • Have developed finger strength and control in order to be able to manipulate and use tools independently and effectively. • Hold and operate scissors correctly to make snips in paper	• Hold a pencil effectively and with good control- using the tripod grip in almost all cases. • Hold a pencil close to the point. • Have a preference for a dominant hand, consistently. • Use scissors correctly to cut around a picture along the lines. • Use paint brushes with control to paint recognisable pictures. • Show more accuracy and care when drawing. • Draw recognisable pictures with more details e.g. a person should have a head, body, arms and legs from the body, eyes, nose, mouth, hair etc
Expressive Arts and Design **Creating with Materials**	• Use a range of resources to build with a purpose or meaning e.g. junk modelling, construction kits, loose parts, wooden blocks	• Be able to talk through from designing to building what they have used and why they have chosen to use that resource or technique

Specific Vocabulary linked to this subject can be found in the Woodham Burn EYFS Curriculum Document.

Key Stage 1 and Key Stage 2 Programme of Learning

Our programme of learning at Woodham Burn Primary is broken down into 3 stages: KS1 LKS2 and UKS2. The curriculum is progressive, building upon previous learning covering all aspects of the statutory national curriculum objectives.
The progression tables outline the specific knowledge and skills which pupils are expected to learn, along with the specific vocabulary which supports this understanding. Each unit of work is gathered under the appropriate discipline, and progression tables are organised to support the order of the learning journey across school over a two-year cycle.

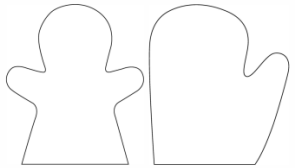
Key Stage 1

In years 1 and 2, children begin to design for a given purpose, or for a specified person or group of people – the user. Children learn to use their knowledge of existing products to help inspire their own designs, and be will introduced to some key designers and products through time. They will be introduced to the 'design cycle', and will start to communicate their ideas through talking and drawing. They will be supported in using simple design criteria to develop these ideas. Children will begin to say how their products will work, and how they will make them suitable for their users.
Across Key Stage 1 pupils learn core foundation skills across the key areas of cookery, construction and textiles, for example: threading a needle, basic sewing stitches, cutting and joining materials, strengthening basic structures, and measuring and cutting ingredients. How to be safe and hygienic whilst using specific tools will be taught and revisited consistently throughout all units.
Throughout the design cycle, children will be encouraged to talk about their design ideas and what they are making. By the end of the Key Stage, children will be making simple judgements about their products using specific design criteria and suggesting how their products or designs could be improved.

Key Stage 2

Across Key Stage 2, children continue to immerse themselves in practical textiles, construction and cookery sessions, building upon their understanding and experiences of design from Key Stage 1. Children will become increasingly confident in understanding and working through the 'design cycle', and this will form the basis of all teaching. They will continue to design based on a target user and will learn how to gather information about the user's wants and needs, using this to inform their designs. By Upper Key Stage 2, this research will take the form of surveys, interviews and web-based investigation. Children will be able to indicate key features of their design that will appeal to their intended users and explain how particular parts of their products work.
Building upon the foundation of core skills taught in Key Stage 1, pupils will begin to use a wider range of materials and tools with improved precision and deftness. They will be introduced to techniques that involve a number of steps and will be taught how to select suitable tools and materials to suit particular methods. Building upon the skills taught in previous years, children will be sewing, finishing textiles, assembling and joining components and preparing ingredients with increasing accuracy. By the end of the Key Stage, pupils will be demonstrating resourcefulness when tackling practical problems.
Children will use design criteria to evaluate their completed products, identifying strengths and areas for development in their own outcomes, as well as those of their peers. By Upper Key Stage 2, children will consider the views of others, including their target users, to improve and amend their design ideas. By the end of the key stage, children will be able to assess the quality of their designs, including their manufacture and fitness for purpose. They will explore important and impactful designers and existing products throughout history, consider other areas of design such as sustainability and cost-effectiveness, and begin to think about the impact products may have beyond their intended purpose.

YEAR 1

	Mechanical Systems Wheels and Axels: Pull- along Toy	Cooking & Nutrition: Smoothies	Textiles: Puppets
Knowledge	1. I can choose the most suitable tool for cutting different shapes. 2. I can carefully cut out wheels of different shapes. 3. I can design and create a way to attach wheels securely to a base. 4. I can carefully cut out curved wheels. 5. I can find the middle of a circle. 6. I can test and compare different shaped wheels. 7. I can use scissors to make my wheel smoother. 8. I can compare my wheel to the design criteria. 9. I can identify uses for my pull-along base. 10. I can discuss the needs of the user. 11. I can draw a picture to show my design choices. 12. I can name the materials used in my design. 13. I can choose the best material to make a pull-along toy from. 14. I can decorate my toy carefully. 15. I can share what I like and dislike about my toy with my class.	1. I can name fruits: pepper*, cucumber*, tomato*, grape, apple, orange, kiwi, strawberry, banana, pineapple, mango, and blueberry. *Mistaken as vegetables. 2. I understand that some foods we call vegetables are fruits *Mistaken as vegetables. 3. I can name vegetables: potato, carrot, green bean, lettuce, onion, spinach, parsnip. 4. I know that a fruit is the sweet and fleshy product of a tree or other plant that contains seed and can be eaten as food. 5. I know that fruits and vegetables grow in one of three places: on trees or vines (apples/tomatoes), above the ground (lettuce), below the ground (carrots/potatoes). 6. I can suggest what fruits and/or vegetables are in a drink. 7. I can taste fruits and vegetables (see 1 & 2) and describe their appearance/feel, smell, taste, texture. 8. I can make a choice as to what smoothie I will make based upon appearance, smell, taste, texture. 9. I know how to prepare fruit and vegetables (washing and peeling/cutting away skin). 10. I can use a knife to cut safely with adult supervision. 11. I know how to use a blender with adult supervision. 12. I can make a smoothie with adult supervision.	1. I know how to join fabric by pinning, stapling, gluing, running stitch. 2. I can design a puppet thinking about size, colours and suitable design. 3. I can build my design on a template.  4. I can use a template to cut out fabric. 5. I can align two pieces of fabric. 6. I can join fabrics together with a running stitch. 7. I can align two pieces of fabric. 8. I can use joining methods to decorate my puppet (choice of gluing, stapling, stitching). 9. I can still put my hand into the puppet after it is decorated. 10. I can evaluate mine and others' work- size, design, colours, does it work as a puppet?

Vocabulary	• axle • careful • choose • mechanism • move (movement) • roll • slide • straight line • tool • turn • wheel • design • material • needs • toy designer • user • evaluate	• Fruit • Leaf • Root • Seed • Stem • Vegetable • Healthy • Smoothie • Carton • Design • Flavour • Peel Slice	• Design • Equipment • Glue • Inspiration • Method • Safety pin • Technique • Template •
Resources	• Coloured pens or pencils • blunt pencils • sticky tack • dowel • masking tape • string • wheels	• Fruits and Vegetables to observe and taste over the course of the topic. • Paper plates • Knives • Plastic Cups • Blender for smoothies • Peelers • Chopping boards • Paper/hand towels	• PVA glue/ Fabric Glue • Staples • Pins • Fabric Scraps • Fabric • Scissors • Needle • Thread

*There are 4 Strands in Key Stage 1, therefore textiles and food are repeated in year 1 and year 2. Electrical Systems and Digital World do not begin until KS2.

YEAR 2			
	Structures: A Chair for a Bear	**Textiles: Pouches**	**Cooking & Nutrition: A Balanced Diet**
Knowledge	1. I can describe how a chair's design matches its use. 2. I can identify the user and purpose from a design brief. 3. I can link design criteria to a product. 4. I can recall which shapes are stronger than others. 5. I can test how strong different shapes are. 6. I can use the words strength, strong and weak correctly. 7. I can use the words stiff and flexible to correctly describe materials. 8. I can explain why different materials are used for different products. 9. I can describe how material thickness affects strength and stiffness. 10. I can select materials for a product. 11. I can join materials securely. 12. I can make choices to try to make a strong and stable structure. 13. I can decide if a product matches the design criteria. 14. I can use suggested ways to improve a product. 15. I can make decisions about a product, so it is right for the user.	1. I can thread a needle. 2. I can sew a running stitch. 3. I can use neat and evenly spaced stitches to join fabric. 4. I can remember how to use a template. 5. I can cut fabric neatly. 6. I can pin fabric accurately. 7. I can design a pouch. 8. I can sew neat, even stitches. 9. I tie a knot at either end of the thread. 10. I can design decorations for my product. 11. I can join items using fabric glue or stitching. 12. I can decorate fabric using different items. 13. I can evaluate my own designs.	1. I know that 'hidden sugars' are ingredients in food and drink and although they are not seen as 'sugar' can still cause tooth decay. 2. I know where to find the nutritional information on a drink's container. 3. I know that there are five food groups, made up of: fruit and vegetables, starchy carbohydrates, proteins, dairy, oils and spreads. 4. I know roughly how much of each food group I should eat each day e.g. Two portions of fruit. At least three portions of vegetables. Some carbohydrates. Some proteins. A small number of oils and spreads. (A portion is a 'fist full,' so it changes in size as we grow.) 5. I know how to experience food through touch and smell 6. I can consider and review food combinations 7. I can create a design criterion for a food wrap e.g. t*he wrap must be healthy, the wrap should include a protein, vegetable or fruit and a dairy product, the wrap should be tasty but not expensive* 8. I know that the most ideal ingredient combinations for my wrap will contain foods from more than one food group. 9. I can design a wrap with a suitable food group combination. 10. I know how to slice food safely using the bridge or claw grip. 11. I can use good food hygiene practice to make my wrap e.g. Wash your hands with hot water and antibacterial soap, 12. I can use my design criteria (above 7) to evaluate my design.

Vocabulary	• chair • design brief • design criteria • purpose • user • weak • curved • shape • strength • strong • stiff • flexible • join • measure	• decorate • fabric • fabric glue • knot • needle • needle threader • running stitch • sew • template • thread	• Balanced diet • Balance • Carbohydrate • Dairy • Fruit • Ingredients • Oils • Sugar • Protein • Vegetable • Design Criteria • Bridge/Claw drip • Evaluation
Resources	• Masking tape • Paper towers • paper • tissue paper • dowel • foil • fabric • newspaper • glue sticks]paper straws	• Children's needles (larger than normal). • Thread (thick but not woolly). • Felt • Needle threading tool (optional). • Scissors (ideally, fabric scissors). • Pins.	• Selection of cans, cartons or bottles including a fruit juice and a sugar-free counterpart of one of the drinks • 100g of sugar • Vegetables and fruits, protein, dairy foods to food test- must check for allergies. e.g. vegetables and fruits (cucumber, tomato, lettuce, onion) Protein (tuna, ham, egg, hummus) Dairy (cheddar cheese, cream cheese) • cocktail sticks • Wraps • Ingredient check list for wraps • Knives • Aprons

*There are 4 Strands in Key Stage 1, therefore textiles and food are repeated in year 1 and year 2. Electrical Systems and Digital World do not begin until KS2.

YEAR 3			
	Structures: Constructing a (prehistoric) monument	**Mechanical Systems: Pneumatic Toys**	**Textiles: Cushions**
Knowledge	1. I can identify different features of the chosen monument. 2. I can design my own monument. 3. I can draw the design of my monument using 2D shapes, labelling: the 3D shapes that will create the features, materials and colours. 4. I know that a net is what a 3D shape would look like if it were opened out flat. 5. I can construct a range of 3D geometric shapes using a net by cutting along bold lines, folding along dotted lines, keeping the tabs the correct size, making crisp folded edges, constructing the net using glue. 6. I can construct my monument to meet the requirements of my brief by: -making neat 3D shapes using nets -stacking shapes and recyclable materials to make the structures of my monument -creating a base to secure my structures to -adorning my monument with appropriate decorative features 7. I can evaluate my work and the work of others.	1. I know that mechanisms are a system of parts that work together to create motion 2. I know that a pneumatic system can be used as part of a mechanism 3. I know that pneumatic systems are used in a range of everyday objects (bicycle pumps, jack in the box, bus doors) 4. I know that a pneumatic system can force air over a distance to create movement. 5. I can develop design criteria (colourful and appealing to a child, no choking hazards, not easily broken, have pneumatic system) 6. I can generate suitable ideas using thumbnail sketches. 7. I can create a pneumatic system to create a desired motion. 8. I can build secure housing for a pneumatic system. 9. I know that syringes and balloons can be used to create different types of pneumatic systems. 10. I know how to use these components to make a functional and appealing pneumatic toy.	1. I can use cross-stitch. 2. I know how to appliqué. 3. I can reflect on the techniques used. 4. I can design a cushion. 5. I can use a paper template. 6. I can cut fabric accurately. 7. I can follow design criteria. 8. I can use cross-stitch. 9. I can add appliqué.

Vocabulary	• Monument • Structure • Design • Strong • Stiff • Stable • 3D • 2D • Net • Tab • Scoring	• Mechanism • Lever • Pivot • Linkage system • Pneumatic system • Input • Output • Component • Thumbnail sketch • Research • Adapt • Properties • Reinforce • Motion	• accurate • appliqué • cross-stitch • cushion • design • embellish • fabric • patch • running stitch • seam • stuffing • template • thread
Resources	• Printed nets: cuboid, cube, prism, pyramid, cylinder and a cone using: • Scissors (one per pupil) • Glue sticks (one between two pupils) • Blue tac • Tape • Collected kitchen roll tubes, packaging etc • Optional: squared paper for children to make their own nets.	• Balloon • Tape • Small, lightweight, toy • Syringes: two the same size and one of a different size • Tubing to connect the syringes (40-50cm lengths of plastic tubing, approximately 5mm diameter) • Mild disinfectant • Pre-made linkage systems • Masking tape • A few books • Some sandwich bags • A box with a hinged lid • Materials to make the pneumatic toys: card, straws, pipe cleaners, cotton wool, buttons, bottles, socks, plastic bags, stuffing, etc	• Fabric and felt • Sewing needles (one each). • Needle threaders (one between two). • thread • Seam ripper (optional). • Safety pins • Scissors or fabric scissors • Decorative items, such as beads, sequins or buttons

YEAR 4			
	Electrical Systems: Torches	**Cooking & Nutrition: Adapting a Recipe**	**Digital World: Mindful Moments Timer**
Knowledge	1. I can identify electrical products. 2. I know what electrical conductors and insulators are. 3. I know that a battery contains stored electricity and can be used to power products. 4. I can identify the features of a torch. 5. I understand how a torch works. 6. I can say what is good and bad about different torches. 7. I understand what is important in torch design. 8. I can factor in who my product is for in my design criteria. 9. I can design a torch which satisfies both the design and success criteria. 10. I can make a working circuit with a switch. 11. I can use appropriate equipment to cut and attach materials. 12. I can assemble a torch according to my design criteria. 13. I can assemble a torch which satisfies the success criteria. 14. I can test my torch to evaluate its success.	1. I can evaluate a product and consider (taste, smell, texture, appearance, packaging, target audience). 2. I can use good food hygiene practice e.g. Wash your hands with hot water and antibacterial soap, remove any jewellery, Tie back your hair, wear an apron and roll up your sleeves. 3. I can follow a recipe to make a biscuit 4. I can cook to a recipe and adapt it to create a new biscuit prototype 5. I can evaluate and compare a range of biscuit prototype (taste, texture, appearance) 6. I can work as a group to design a biscuit that would sell for £1.99 considering taste, texture, appearance. 7. I can create branding for my group's final product including *Product name and logo* *The unique selling point or special ingredients the biscuits contain (including quantities!)* *A clear target audience* *What their packaging will look like (shape and colour)* 8. I can make suitable packaging for my product including branding designs (see above 7).	1. I can compare existing mindfulness products. 2. I can state the advantages and disadvantages of a product. 3. I can make links between a product's form and its function. 4. I can write design criteria to fulfil a design brief. 5. I can use research to decide about design criteria. 6. I can use prior knowledge to decide about design criteria. 7. I can create code that controls a timer. 8. I can debug my code to ensure that it works. 9. I can identify coding blocks used for loops. 10. I can annotate a product concept drawing. 11. I can create a 3D model using modelling materials. 12. I can discuss my design with a partner. 13. I can select a theme suitable for mindfulness. 14. I can design a brand that would appeal to a teacher. 15. I can use the layer tool on CAD software to improve my design. 16. I can collect feedback from a user. 17. I can suggest changes to my design based on feedback.

Vocabulary	• battery • bulb • buzzer • circuit diagram • component • conductor • electrical item • electricity • electronic item • insulator • series circuit • switch • target audience • test • torch • wire •	• Design Criteria • Research • Texture • Innovative • Aesthetic • Measure • Cross-contamination • Diet • Process • Packaging •	• advantage • aesthetic • annotate • assemble • block • brand • brand identity • bug • clipart • coding • computer-aided design (CAD) • criteria • debug • design • develop • disadvantage • display • ergonomic • evaluate • exhibition • feedback • form • function • join • logo • loop • mindfulness • model • net • program • prototype • research • script • sketchpad • test • timer • user
Resources	• Electric circuit component sets • 1 battery,1 battery holder, 3 wires, 1 bulb, 1 buzzer. • Equipment to make a switch (one set per table – see Main event): • 1 small cardboard rectangle • 2 split pins • 1 paper clip • 1 sharp pencil and rubber (to pierce holes). • Materials to make a torch housing, for example, plastic bottles, packaging, cardboard, tin foil, bubble wrap, string and foam. • Materials to prevent the circuit from moving around in the housing (e.g. stuffing, bubble wrap, foam, tissue paper or scrap paper). • Materials to decorate torches (e.g. sugar paper, coloured paper or card, colouring pencils, felt tip pens and crafting supplies).	• Six different types of biscuits for children to taste • Recipe ingredients (dependent on your chosen recipe) • Butter knives • Bowls and Wooden spoons • Scales and Baking trays • Baking parchment/paper • Oven	• Link: 'Microsoft makecode micro:bit editor' • Access to a device • Modelling clay • Art straws • Scissors • Glue stick, double-sided tape and/or sticky/masking tape • Coloured card, sugar paper, corrugated coloured paper/card •

YEAR 5			
	Textiles: Stuffed Toys	**Mechanical Systems: Pop Up Book**	**Cooking & Nutrition: What could be healthier**
Knowledge	1. I can design a suitable stuffed toy e.g. (safety, aesthetics, size, durability). 2. I can make a paper template. 3. I can create strong and secure stitches (blanket, running, cross stitch) 4. I can use applique to attach pieces of fabric decoration. 5. I can stuff my toy carefully, repairing any holes or gaps. 6. I can evaluate my stuffed toy (safety, aesthetics, size, durability).	1. I can remember that input is the motion used to start a mechanism and output is the motion that results from starting the input. 2. I know that structures use the movement of the pages to work. 3. I know that mechanisms control movement. 4. I can design a book with a front cover and four pages, including a mixture of structures and mechanisms. 5. I can use paper, card and glue to make my book structure. 6. I can make mechanisms and structures as detailed in my design template by using sliders, pivots and folds to create movement. 7. I can complete the mechanisms and structures as detailed in my design template. 8. I can make my book look neater and more attractive by using layers and spacers to hide relevant parts of my mechanisms.. 9. I know that I need to consider the preferences and needs of the user. 10. I know that good quality making should be neat, accurate and securely assembled.	1. I know that beef is the name of meat from cattle (cows). 2. I have an understanding of the ethical issues around the way in which cattle should be farmed (free from hunger, discomfort, pain, fear and distress) 3. I know what foods make up a balanced diet (5 food groups) 4. I know how a recipe can be adapted to make it healthier 5. I can use keywords to research for alternative ingredients for a well-known dish e.g. 'unusual bolognese recipe', 'different bolognese recipe', 'vegetarian bolognese recipe' and 'alternative bolognese recipe' 6. I know that the nutritional value of a recipe can change if you remove, substitute or add additional ingredients. 7. I can calculate and compare two bolognese recipes by using a nutritional calculator. 8. I can write an amended method for my recipe to include any relevant changes to ingredients. 9. I can use equipment safely, including knives, hot pans and hobs. 10. I know how to avoid cross-contamination (wash your hands before cooking, keep raw and cooked foods separate and use clean equipment). 11. I can carefully follow a method to make a recipe. 12. I know how to chop an onion. 13. I can design appealing packaging that reflects my recipe.

Vocabulary	• Design • Template • Model • Stuffed toy • Fabric • Running stitch • Cross-stitch • Blanket Stitch • Appendages • Aesthetics • Durability	• criteria • design • input • mechanism • model • motion • reinforce • research	• Beef • Reared • Processed • Ethical • Diet • Ingredients • Supermarket • Farm • Balanced
Resources	• Homemade toys • A4 paper or card (per pupil) • Fabric in different colours and scraps • Pins • Scissors • Thread • Needles • Material to stuff- e.g. wadding	• A selection of pop-up/interactive books and greeting cards (a selection per table – see Attention grabber). • A disassembled mechanism from a greetings card. • A demonstration model pop-up book (see Teacher knowledge). • Colouring pencils (a selection per table). • Sticky notes (approximately four each). • A3 card (three sheets each, two sheets trimmed one centimetre shorter – see Teacher knowledge); • Rulers (one each); • Scissors (one between two); • Glue sticks (one between two); • Rubbers (one between two); • Scrap or smaller pieces of card to create the mechanisms and structures (a selection per table); • Split pins (enough for the children making levers). • Thick or corrugated card to make spacers. • Any other finishing materials you want to supply, e.g. foil, crepe paper, wobbly eyes, pipe cleaners, felt, etc.	• Two beef Bolognese sauces for children to taste test. * If you have vegetarians in your class, also provide similar examples of Bolognese sauces without beef. • Access to a cooker hob • Chopping boards (red and green) • Peelers • Knives • Pans • Wooden spoons • Graters • Garlic crushers • Empty, clean jars or Tupperware (one per pupil)

YEAR 6

	Electrical Systems: Electronic Greetings Card/Postcard	Structures: Playgrounds	Digital World: Navigating The World
Knowledge	1. I can describe the historical development of personal message exchange (stone-age drawings- paper messages- e-messages). 2. I can analyse and evaluate a range of existing greeting cards (Seasonal, Commemorative, Sentimental). 3. I can write design criteria for an electronic greeting card (Purpose – function of the card, Design – form of the card, Ease of use to send and receive). 4. I can construct a series circuit with a cell, wires, bulb. 5. I can draw a series circuit diagram and symbols. 6. I can explain how a series circuit will work in my card. 7. I can generate ideas inspired by research. 8. I can annotate design ideas to include key information e.g. design circuit location. 9. I can review design ideas against design criteria- function, practicality, quality of finish, circuit, function, and aesthetics. 10. I can explain how my series circuit works in my card 11. I can evaluate my final greeting card design- function, practicality, quality of finish, circuit, function, and aesthetics.	1. I know that there are different types of structures used in playground apparatus e.g. tunnels, swings, frames, slides. 2. I can consider how the structures can be used e.g. climb, roll, slide, swing 3. I can create a design criterion for the playground e.g. *It must be safe.* *It must be fun.* *There must be something to climb up.* *There must be somewhere to hide inside.* *There must be something that moves.* *There must be enough space around each piece of apparatus.* 4. I can design five different pieces of apparatus. 5. I can improve my design based on peer evaluation 6. I can build play apparatus structures using the techniques demonstrated as well as prior knowledge of structures 7. I know that structures can be strengthened by manipulating materials and shapes (dowel, glue guns, lolly sticks, rectangles, arches, and triangles). 8. I can measure, mark, cut and shape wood to create a range of structures (rectangles, arches, and triangles). 9. I can test and adapt my design to improve it. I can use a range of materials to reinforce and add decoration to my structures.	1. I can write a design brief from information submitted by a client. 2. I can develop design criteria to fulfil the client's request. 3. I can consider and suggest additional functions for my navigation tool. 4. I can program an n, e, s and w cardinal compass. 5. I can explain the key functions in my program, including any additions. 6. I can explain how my program fits the design criteria and how it would be useful as part of a navigation tool. 7. I can consider materials and their functional properties. 8. I can understand the need for sustainability in design. 9. I can develop a product idea through annotated sketches. 10. I can identify key industries that utilise 3D CAD modelling and explain why. 11. I can place and manoeuvre 3D objects using computer-aided design. 12. I can change the properties of or combine one or more 3D objects using computer-aided design to produce a 3D CAD model. 13. I can explain the key functions and features of my navigation tool. 14. I can explain my material choices and why they were chosen. 15. I can describe how my product fits the client's request and how it will benefit the customers.

Vocabulary	• Greeting card • Purpose • Seasonal • Sentimental • Personalised • Design brief • Design criteria • Circuit • Components • Series circuit • Bulb • Battery/Cell • Crocodile clip/wire • Switch • Current • Flow	• Apparatus • Design criteria • Equipment • Playground • Landscape features • A swing or swinging tyre with an A-frame. • A climbing frame – using knowledge of pavilions. • A tunnel. • A slide, including a ladder up one side. • A playhouse or treehouse. • A climbing wall or climbing net. • Monkey bars • See Saw	• application (apps) • biodegradable • cardinal compass • client • corrode • loop • navigation • pedometer • product lifecycle • product lifespan • program • recyclable • replica • smart • smartphone • sustainable design • value • variable
Resources	• Basic series circuit • Card • Examples of Greetings Cards/Postcards • A3 card or paper – one sheet per pupil • Glue sticks • Scissors • Colouring pens and pencils	• Glue gun • Pipe Cleaner • Dowel • Lolly Pop Sticks • Junk Modelling Materials • Playdough • Natural outdoor materials (leaves, twigs, soil) •	• Pens or pencils (one each). • Highlighters (optional, one each, see Main event). • Website: 'Micro: bit Make Code editor' • BBC micro:bits • Whiteboard and pen (one each). • Pencils or pens (one each). • Sketching pencils (one each). • Colouring pencils • Computers or laptops with wired mice (one each). • Website: 'Tinkercad'.