Design and Technology Mixed Age Knowledge and Skills Progression Map

<table>
<tr><th colspan="3">Early Years Foundation Stage
Early Learning Goal: By the end of the Summer term, children at the expected level of development will meet the ELGs detailed below.</th></tr>
<tr><td>Expressive Arts and Design
Explore different materials freely, in order to develop their ideas about how to use them and what to make.
Develop their own ideas and then decide which materials to use to express them.
Join different materials and explore different textures.</td><td>Creating with materials
Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
Share their creations, explaining the process they have used.
Make use of props and materials when role playing characters in narratives and stories.</td><td>Physical development
Fine Motor Skills: Use a range of small tools, including scissors, paintbrushes and cutlery.</td></tr>
<tr><th colspan="2">National Curriculum Key Stage 1</th><th>National Curriculum Key Stage 2</th></tr>
<tr><td colspan="2">Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

When designing and making, pupils should be taught to:

Design:
design purposeful, functional, appealing products for themselves and other users based on design criteria.
generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.</td><td>Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

Design:
use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.
generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.</td></tr>
</table>

Make: • select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics **Evaluate** • explore and evaluate a range of existing products • evaluate their ideas and products against design criteria **Technical knowledge** • build structures, exploring how they can be made stronger, stiffer and more stable • explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. **Cooking and Nutrition** As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life. Pupils should be taught to: • use the basic principles of a healthy and varied diet to prepare dishes • understand where food comes from.	**Make:** • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately • select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities **Evaluate** • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design and technology have helped shape the world **Technical knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex structures • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products. **Cooking and Nutrition** As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life. Pupils should be taught to: • understand and apply the principles of a healthy and varied diet. • prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. • understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

Curriculum Intent	At St Teresa's Catholic Primary School we want to prepare our children to deal with a rapidly changing world. We want them to become independent, creative problem-solvers and to be able to think both as individuals and as part of a team. We believe that a high-quality design and technology curriculum enables our children to develop critical thinking and understanding of global issues, relevant to our rapidly changing world, and how these can be solved or improved through designs of technology. Our Design and Technology curriculum inspires children to think creatively, innovatively and inquisitively. We provide varied learning opportunities which aim to develop not only children's technical skills; but also to develop their wider knowledge of product design, evaluation and their ability to apply vocabulary accurately.
Implementation	Design Technology is taught as a discrete subject across KS1 and KS2 and, wherever possible, cross curricular links with Mathematics, Science, Computing and PSHE are formed. Our curriculum covers the skills outlined in the National Curriculum through broad, challenging and inspiring units of work. We currently follow the Kapow scheme of learning which clearly organises specific skills and knowledge into appropriate year groups. Due to mixed age classes, our learning takes place over a two year rolling cycle (A and B) with at least three Design Technology topics taught per year. Progression grids are used in order to ensure knowledge, skills and vocabulary are built upon each year and sequenced appropriately to maximise learning for all pupils. Children have access to knowledge organisers, where they will be able to access key knowledge, vocabulary and meanings to technological terms. In EYFS, the children are given lots of opportunities to explore skills such as problem solving, building with a purpose, designing and making. This is done through a mixture of high quality, child-led engaging continuous provision and focused adult-led tasks. Learning is designed to meet the needs of all learners including pupils with SEND and more able pupils. Evidence of design and technology is mostly kept in individual DT books, however it may be found in sketchbooks or Science books if there is a strong cross-curricular link for that unit. Seesaw is also used to capture photographs of the children's DT work. Assessments take place at the end of each unit and these contribute to a summative assessment at the end of the year's teaching.
Measuring the Impact	Through the teaching of Design and Technology, children will have: • The ability to carry out thorough research, show initiative and ask questions to develop a detailed knowledge of user's needs. • The ability to act as responsible designers and makers, using materials carefully and working safely. • A thorough knowledge of which tools, equipment and materials to use to make their products. • The ability to manage risks well to manufacture products safely and hygienically. • A passion for the subject and an excellent attitude to their learning. The Design and Technology curriculum at St Teresa's has the intended impact and we have a range of ways to measure its success. Monitoring activities are planned, purposeful and cyclical. The Kapow scheme is used alongside the Design and Technology curriculum and is planned to demonstrate progression. If children are keeping up with the curriculum, they are deemed to be making good or better progress. The curriculum is created to encourage and promote opportunites to develop specigic skills and reinforce skills that have already been established. Teachers continually assess the children's design and technology skills through formative assessments, such as questions, evidence collected in the children's DT books and discussion with the children. The key skills and knowledge from each unit are used for formative, ongoing assessment. Assessment quizzes from the start and end of each unit are analysed to measure the impact of our teaching and learning. Staff use this information to identify gaps in knowledge and key strengths; informing assessments and future teaching. Pupils demonstrate their enjoyment of Design Technology through their participation in lessons. The curriculum is developed to give pupils the confidence to be creative and perform everyday tasks confidently to participate successfully in an increasingly technological world. Monitoring in design technology includes book scrutinies to ensure that each project is meeting the specific skills outlined in the progression of skills map, learning walks, staff discussions and pupil voice. We understand the importance and value of giving children the opportunity to discuss their learning and establish the impact of the teaching taking place. All of this information is collected and reviewed, which is then used to inform further curriculum developments and provision is adapted accordingly. Each year Governors are informed of progress, updates and impact on children's learning in Design and Technology through a presentation with Subject Leader.

	EYFS	KS1	LKS2	UKS2
Design	• Develop their own ideas. • Talk about what they want to make. • Find out about the properties and functions of different construction materials.	• Use pictures and words to convey what they want to design / make. • Explore ideas by rearranging materials. • Select pictures to help develop ideas. • Use recycled material trial models to try out ideas. • Propose more than one idea for their product. • Use drawings to record ideas. • Add notes to drawings to help explanations. • Use ICT to communicate their ideas.	• Develop more than one design or adaptation of an initial design. • Plan a sequence of actions to make a product. • Record the plan by using annotated sketches. • Begin to use cross-sectional and exploded diagrams. • Use prototypes to develop and share ideas. • Propose realistic suggestions as to how they can achieve their design ideas. • Consider aesthetic qualities of materials chosen.	• Record ideas using annotated diagrams. • Plan the sequence of work. • Use models, kits and drawings to help formulate design ideas. • Devise step by step plans which can be followed by someone else. • Use exploded and cross-sectional diagrams to communicate ideas. • Sketch and model alternative ideas. • Decide which design idea to develop.
Make	• Experiment and build with a range of different construction materials. • Use a variety of tools and materials to make models. Create collaboratively, sharing ideas and resources	• Select materials / ingredients from a limited range. • Explain what they are making. • Select and name the tools they are using. • Explain which material / ingredients they are using and why. • Discuss their work as it progresses.	• Select from a range of tools for cutting, shaping, joining and finishing. • Use tools with accuracy. • Select from materials according to their functional properties. • Prepare pattern pieces as templates. • Cut slots and internal shapes. • Select from techniques for different parts of the process. • Use appropriate finishing techniques.	• Develop one idea in depth. • Use researched information to inform decisions. • Make prototypes. • Produce detailed lists of ingredients / components / materials and tools. • Select from and use a wide range of materials and tools. • Cut accurately and safely to a marked line. • Refine their product – review and improve.
Evaluate	• Be excited about what they have made. • Talk about what they have made and what they like/dislike about their models • Identify what they found easy or difficult • Say why and how they would change their models.	• Explore existing products and investigate how they have been made. • Decide how existing products do / do not achieve their purpose. • Talk about their design as they develop and identify good and bad points. • Note changes made during the making process as annotation to plans / drawing. • Say what they like and do not like about items they have made and attempt to say why. • Discuss how closely their finished product meets their own design criteria.	• Investigate similar products to the one to be made to give starting points for a design. • Draw existing products in order to analyse and understand how products are made. • Research needs of user. • Identify the strengths and weaknesses of their design ideas in relation to purpose / user. • Decide which design idea to develop. • Consider and explain how the finished product could be improved. • Discuss how well the finished product meets the user's design criteria. • Investigate key events and individuals in design and technology.	• Research and evaluate existing products. • Consider user and purpose. • Identify the strengths and weaknesses of their design ideas. • Report using correct technical vocabulary. • Consider and explain how the finished product could be improved related to design criteria. • Discuss how well the finished product meets the design criteria, having tested on or discussed outcomes with the user. • Investigate key events and individuals in design and technology. • Understand how key people have influenced design.

Design & Technology within EYFS

EXPRESSIVE ARTS & DESIGN

In the **Foundation Stage**, the development of children's design and making supports their imagination and creativity. Children explore and play with a wide range of media and materials.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topics	**All about me**	**All around me**	**Amazing animals**	**Superheroes**	**Come outside**	**Our wonderful world**
	Structures: Junk modelling		**Seasonal projects: Spring – flower threading**		**Food: Designing and making a rainbow salad**	
Coverage	• Independently access a range of materials and tools presented in different ways. • Develop control of tools and techniques whilst working on Christmas crafts. • Explore and learn about various types of joining technique.		• Select the tools and techniques they need to assemble materials they are using. • Use their increasing knowledge and understanding of tools and materials to explore their interests and enquiries and develop their thinking. • Handle tools, objects, construction and malleable materials with increasing control. • Develop control of tools and techniques whilst working on Mother's Day and Easter crafts. • Develop small motor skills to use a range of tools competently, safely and confidently, including knives, forks and spoons. • Return to and build on their previous learning.		• Design and construct a model, thinking about form and function. • Draw their model, identifying key features. • Use simple tools with different functions/mechanism including tools for baking e.g., whisk, biscuit cutter • Manipulate and control equipment and materials when engaged in creative activities e.g., spreaders, tape, split pins, card, fabric • Independently and safely use and explore a variety of different: -materials, tools, techniques, colour, design, texture, form, function • Control and use a range of small tools, including scissors and cutlery. • Share their creation, explaining the process they have used. • Understand the importance of healthy food choices	

		Technical Knowledge and Skills: STRUCTURES		
		KS1: Constructing a Windmill	**LKS2: Constructing a castle**	**UKS2: Bridges**
Skills	Design	• Learning the importance of a clear design criteria • Including individual preferences and requirements in a design.	• Designing a castle with key features to appeal to a specific person/purpose. • Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours • Designing / decorating a castle tower on CAD software	• Designing a stable structure that is able to support weight. • Creating frame structure with focus on triangulation.
	Make	• Making stable structures from card, tape and glue • Explore how to make structures stronger and more stable. • Learning how to turn 2D nets into 3D structures • Following instructions to cut and assemble the supporting structure of a windmill. • Making functioning turbines and axles which are assembled into a main supporting structure	• Constructing a range of 3D geometric shapes using nets • Creating special features for individual designs • Making facades from a range of recycled materials	• Making a range of different shaped beam bridges • Using triangles to create truss bridges that span a given distance and supports a load • Building a wooden bridge structure • Independently measuring and marking wood accurately. • Selecting appropriate tools and equipment for particular tasks. • Using the correct techniques to saw safely. • Identifying where a structure needs reinforcement and using card corners for support. • Explaining why selecting appropriating materials is an important part of the design process.
	Evaluate	• Say what they like and do not like about items they have made and attempt to say why.	• Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design • Suggesting points for modification of the individual designs.	• Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. • Suggesting points for improvements for own bridges and those designed by others.
Knowledge		• To know that a client is the person I am designing for • To know that design criteria is a list of points to ensure the product meets the client's needs and wants. • To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. • To know that windmill turbines use wind to turn and make the machines inside work. • To know that a windmill is a structure with sails that are moved by the wind. • To know the three main parts of a windmill are the turbine, axle and structure.	• To understand that wide and flat based objects are more stable • To understand the importance of strength and stiffness in structures • To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose • To know that a façade is the front of a structure • To understand that a castle needed to be strong and stable to withstand enemy attack • To know that a paper net is a flat 2D shape that can become a 3D shape once assembled • To know that a design specification is a list of success criteria for a product	• To understand some different ways to reinforce structures. • To understand how triangles can be used to reinforce bridges. • To know that properties are words that describe the form and function of materials. • To understand why material selection is important based on their properties. • To understand the material (functional and aesthetic) properties of wood. • To understand the difference between arch, beam, truss and suspension bridges. • To understand how to carry and use a saw safely.

		Technical Knowledge and Skills: TEXTILES		
		KS1: Pouches	**LKS2: Cushions**	**UKS2: Stuffed toys**
Skills	Design	• Designing a pouch.	• Designing and making a template from an existing cushion and applying individual design criteria.	• Designing a stuffed toy considering the main component shapes required and creating an appropriate template. • Considering the proportions of individual components.
	Make	• Cutting fabric neatly with scissors. • Selecting and cutting fabrics for sewing (Y2) • Neatly pinning and cutting fabric using a template. • Decorate a pouch using fabric glue or running stitch. • Sequencing steps for construction. • Threading a needle with support (Y2) • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric (Y2)	• Following design criteria to create a cushion. • Selecting and cutting fabrics with ease using fabric scissors. • Threading needles with greater independence. • Tying knots with greater independence. • Sewing cross stitch or running stich to join fabric. • Decorating fabric using appliqué. • Sew on buttons and make loops. • Completing design ideas with stuffing and sewing the edges.	• 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 applique to attach pieces of fabric decoration • Sewing blanket stitch to join fabric. • Applying blanket stitch so the space between the stitches are even and regular. • Make quality products.
	Evaluate	• Troubleshooting scenarios posed by the teacher. • Discussing as a class the success of their stitching against the success criteria. • Evaluating the quality of the stitching on others' work. • Identifying aspects of their peers' work that they particularly like and explaining why.	• Evaluating an end product and thinking of other ways in which to create similar items.	• Testing and evaluating an end product and giving point for further improvements.
Knowledge		• Know that 'joining technique' means connecting two pieces of material together. • Know that there are various temporary methods of joining fabric by using staples. glue or pins. • Understand that different techniques for joining materials can be used for different purposes. • Understand that a template (or fabric pattern) is used to cut out the same shape multiple times. • Know that sewing is a method of joining fabric • Know that different stitches can be used. • Understand the importance of tying a knot after sewing the final stitch.	• Know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric. • Know that when two edges of fabric have been joined together it is called a seam. • Know that it is important to leave space on the fabric for the seam. • Understand that some products are turned inside out after sewing so the stitching is hidden.	• To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric • To understand that it is easier to finish simpler designs to a high standard • To know that soft toys are often made by creating appendages separately and then attaching them to the main body • 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.

		Technical Knowledge and Skills: FOOD					
		KS1: Fruit & Veg	**KS1: A balanced diet**	**LKS2: Eating seasonally**	**LKS2: Adapting a recipe**	**UKS2: What could be healthier**	**UKS2: Come dine with me**
Skills	Design	• Design smoothie carton packaging by-hand or on ICT software.	• Design a healthy wrap based on a food combination which work well together	• Create a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.	• Design a biscuit within a given budget, drawing upon previous taste testing.	• Adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. • Write an amended method for a recipe to incorporate the relevant changes to ingredients. • Design appealing packaging to reflect a recipe.	• Write a recipe, explaining the key steps, method and ingredients. • Include facts and drawings from research undertaken.
	Make	• Chop fruit and vegetables safely. • Identify if a food is a fruit or a vegetable. • Learn where and how fruits and vegetables grow.	• Slice food safely using the bridge or claw grip • Construct a wrap that meets a design brief.	• Know how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination. • Follow the instructions within a recipe.	• Follow a baking recipe • Cook safely, following basic hygiene rules • Adapt a recipe	• Cut and prepare vegetables safely. • Use equipment safely, including knives, hot pans and hobs. • Know how to avoid cross-contamination. • Follow a step-by-step method carefully to make a recipe.	• Follow a recipe, using the correct quantities of each ingredient. • Adapt a recipe based on research. • Work to a given timescale • Work safely and hygienically with independence.
	Evaluate	• Taste and evaluate different food combinations. • Describe appearance, smell and taste. • Suggest information to be included on packaging.	• Describe the taste, texture and smell of fruit and vegetables. • Taste test food combinations and final products. • Describe the information that should be included on a label. • Evaluate which grip was most effective.	• Establish and use design criteria to help test and review dishes. • Describe the benefits of seasonal fruits and vegetables and the impact on the environment. • Suggest points for improvement when making a seasonal tart.	• Evaluate a recipe, considering: taste, smell, texture and appearance • Describe the impact of the budget on the selection of ingredients • Evaluate and comparing a range of products. • Suggest modifications	• Identify the nutritional differences between different products and recipes. • Identify and describe healthy benefits of food groups.	• Evaluate a recipe, considering: taste, smell, texture and origin of the food group. • Taste testing and scoring final products. • Suggest and write up points of improvements in productions. • Evaluate health and safety in production to minimise cross contamination.

Knowledge		• Understand the difference between fruits and vegetables. • Know that a blender mixes ingredients together into a smooth liquid • Know that a fruit has seeds and a vegetable does not. • Know that fruits grow on trees or vines. • Know that vegetables grow above or below ground and can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber)	• Know that 'diet' means the food and drink that a person or animal usually eats • Understand what makes a balanced diet • Know where to find the nutritional information on packaging • Know the five main food groups. • Understand that I should eat a range of different foods from each food group, and roughly how much of each food group. • Know that nutrients are substances in food that all living things need to make energy, grow and develop.	• Know that not all fruits and vegetables can be grown in the UK. • Know that climate and seasons affect food growth. • Know that imported food is food which has been brought into the country and exported food is food which has been sent to another country. • Understand that imported foods travel from far away and this can negatively impact the environment. • Know that each fruit and vegetable gives us nutritional benefits. • Understand that vitamins, minerals and fibre are important for energy, growth and maintaining health.	• Know that the amount of an ingredient in a recipe is known as the 'quantity' • Know that it is important to use oven gloves when removing hot food from an oven • Know the following cooking techniques: sieving, creaming, rubbing method, cooling • Understand the importance of budgeting while planning ingredients for biscuits.	• Understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues • Know that I can adapt a recipe to make it healthier by substituting ingredients. • Know that I can use a nutritional calculator to see how healthy a food option is • 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.	• Know that many countries have 'national dishes' which are recipes associated with that country • Know that 'processed food' means food that has been put through multiple changes in a factory • Understand that it is important to wash fruit and vegetables to remove dirt and insecticides. • Understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork)

		Technical Knowledge and Skills: MECHANISMS			
		KS1: Wheels and axles	**KS1: Making a moving storybook**	**LKS2: Pneumatic toys**	**UKS2: Automata toys**
Skills	Design	• Design a vehicle that includes wheels, axles and axle holders to allow the wheels to move. • Create clearly labelled drawings which illustrate movement.	• Explain how to adapt mechanisms, using bridges or guides to control the movement. • Design a moving story book for a given audience.	• Design a toy which uses a pneumatic system. • Develop design criteria from a design brief. • Generate ideas using thumbnail sketches and exploded diagrams. • Learn that different types of drawings are used in design to explain ideas clearly.	•Experiment with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement. • Understand how linkages change the direction of a force. • Make things move at the same time. • Understand and draw cross-sectional diagrams to show the inner-working.
	Make	• Adapting mechanisms • Use a range of materials to create models with wheels and axles e.g. tubes, dowel, cotton reels	• Follow a design to create moving models that use levers and sliders.	• Create a pneumatic system to create a desired motion. • Build secure housing for a pneumatic system. • Use syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy. • Select materials due to their functional and aesthetic characteristics. • Manipulate materials to create different effects by cutting, creasing, folding, weaving.	• Measure, mark and check the accuracy of the jelutong and dowel pieces required. • Measure, mark and cut components accurately. • Assemble components accurately to make a stable frame. • Understand that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles. • Select appropriate materials based on the materials being joined and the speed at which the glue needs to dry.
	Evaluate	• Test mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle to move.	• Test a finished product, seeing whether it moves as planned and if not, explain why and how it can be fixed. • Review a product's success by testing it with its audience.	• 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.	• Evaluate the work of others and receive feedback on own work. • Apply points of improvements. • Describe changes they would make/do if they were to do the project again.
Knowledge		• Know that wheels need to be round to rotate. • Understand that for a wheel to move it must be attached to a rotating axle. • Know that an axle moves within an axle holder. • Know that the frame of a vehicle (chassis) needs to be balanced.	• Know that a mechanism is the parts of an object that move together. •Know that a slider mechanism moves an object from side to side • Know that a slider mechanism has a slider, slots, guides and an object. • Know that bridges and guides are bits of card that purposefully restrict the movement of the slider.	• Understand how sketches, drawings and diagrams can be used to communicate design ideas. • Know that exploded-diagrams are used to show how different parts of a product fit together. • Know that thumbnail sketches are small drawings to get ideas down on paper quickly. • Understand how pneumatic systems work. • Understand that pneumatic systems can be used as part of a mechanism. • Know that pneumatic systems operate by drawing in, releasing and compressing air.	• Understand that the mechanism in an automata uses a system of cams, axles and followers. • Understand that different shaped cams produce different outputs. • Know that an automata is a hand powered mechanical toy. • Know that a cross-sectional diagram shows the inner workings of a product. • Understand how to use a bench hook and saw safely. • Know that a set square can be used to help mark 90° angles.

		Technical Knowledge and Skills: ELECTRICAL SYSYTEMS (KS2 ONLY)		
		KS1:	**LKS2: Torches**	**UKS2: Electronic greetings cards**
Skills	Design	N/A	• Design a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.	• Design an electronic greetings card with a copper track circuit and components • Create a labelled circuit diagram showing positive and negative parts in relation to the LED and the battery. • Write design criteria for an electronic greeting card. • Compile a moodboard relevant to my chosen theme, purpose and recipient.
	Make		• Make a torch with a working electrical circuit and switch. • Use appropriate equipment to cut and attach materials. • Assemble a torch according to the design and success criteria.	• Make a functional series circuit • Create an electronics greeting card, referring to a design criteria • Map out where different components of the circuit will go.
	Evaluate		• Evaluate electrical products • Test and evaluate the success of a final product.	• Evaluate a peer's product against design criteria and suggest modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of circuit component. • State what Rowland Hill invented and why it was important for greeting cards • Analyse and evaluate a range of existing greeting cards.
Knowledge			• Understand that electrical conductors are materials which electricity can pass through. • Understand that electrical insulators are materials which electricity cannot pass through. • Know that a battery contains stored electricity that can be used to power products. • Know that an electrical circuit must be complete for electricity to flow. • Know that a switch can be used to complete and break an electrical circuit.	• Know the key components used to create a functioning circuit. • Know that copper is a conductor and can be used in a circuit. • Understand that breaks in a circuit will stop it from working. • Understand that a series circuit only has one path for the electrical current to flow from positive to negative. • Know that we use symbols to represent components in a circuit diagram. • Know the names of the components in a basic series circuit: wires, LED (light-emitting diode), battery holder, battery, cell • Know that product analysis is critiquing the strengths and weaknesses of a product. • Know that 'mass production' is when a product is made in large quantities by a machine, usually in a factory. • Know that one-off production is when only one of a product is made by hand. • Know that 'bespoke' means a product was made for a particular reason or person. • Understand the development of personal message exchange through to the invention of the Penny Black stamp, and exchanging of greeting cards. • Know that a moodboard may include words, sketches, textures, colours, material samples etc. and can act as inspiration when designing.

		Technical Knowledge and Skills: PROGRAMMING, MONITORING & CONTROL (KS2 ONLY)		
		KS1:	**LKS2: Electronic charm**	**UKS2: Monitoring Devices**
Skills	Design	N/A	• Problem solving by suggesting potential features on a Micro: bit and justify my ideas. • Develop design ideas for a technology pouch. • Draw and manipulate 2D shapes, using computer-aided design, to produce a point of sale badge.	• Research (books, internet) for a particular (user's) animal's needs. • Develop design criteria based on research. • Generate multiple housing ideas using building bricks. • Understand 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.
	Make		• Use a template when cutting and assembling the pouch. • Follow a list of design requirements. • Select and use the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch. • Apply functional features such as using foam to create soft buttons.	• 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.
	Evaluate		• Analyse and evaluate an existing product. • Identify the key features of a pouch.	• State an event or fact from the last 100 years of plastic history. • Explain how plastic is affecting planet Earth and suggesting ways to make more sustainable choices. • Explain key functions in my program (audible alert, visuals). • Explain how my product would be useful for an animal carer including programmed features.
Knowledge			• Understand that in programming a 'loop' is code that repeats something again and again until stopped. • Know that a Micro:bit is a pocket-sized, codeable computer. • Write a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm. • Know what the 'Digital Revolution' is and features of some of the products that have evolved as a result. • Know that in Design and technology the term 'smart' means a programmed product. • Know the difference between analogue and digital technologies • Understand what is meant by 'point of sale display' • Know that CAD stands for Computer-aided design.	• Know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record. • Know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose. • Understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met. • Understand key developments in thermometer history. • Know events or facts that took place over the last 100 years in the history of plastic, and how this is changing our outlook on the future. • Know the 6Rs of sustainability. • Understand what a virtual model is and the pros and cons of traditional vs CAD modelling.