# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| Design and Technology - Structures (Following the Kapow Scheme of Work) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Reception | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Unit title | | Junk Modelling | Boats | Constructing a windmill | Baby bear's chair | Constructing a castle | Pavilions | Bridges | Playgrounds |
| Skills | Design | • Making verbal plans and material choices.<br>• Developing a junk model. | • Designing a junk model boat.<br>• Using knowledge from exploration to inform design. | • Learning the importance of a clear design criteria.<br>• Including individual preferences and requirements in a design. | • Generating and communicating ideas using sketching and modelling.<br>• Learning about different types of structures, found in the natural world and in everyday objects. | • Designing a castle with key features to appeal to a specific person/purpose.<br>• Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours.<br>• Designing and/or decorating a castle tower on CAD software. | • Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect.<br>• Building frame structures designed to support weight. | • Designing a stable structure that is able to support weight.<br>• Creating a frame structure with a focus on triangulation. | • Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs. |
| | Make | • Improving fine motor/scissor skills with a variety of materials.<br>• Joining materials in a variety of ways (temporary and permanent).<br>• Joining different materials together.<br>• Describing their junk model, and how they intend to put it together. | • Making a boat that floats and is waterproof, considering material choices. | • Making stable structures from card, tape and glue.<br>• Learning how to turn 2D nets into 3D structures.<br>• Following instructions to cut and assemble the supporting structure of a windmill.<br>• Making functioning turbines and axles which are assembled into a main supporting structure. | • Making a structure according to design criteria.<br>• Creating joints and structures from paper/card and tape.<br>• Building a strong and stiff structure by folding paper. | • Constructing a range of 3D geometric shapes using nets.<br>• Creating special features for individual designs.<br>• Making facades from a range of recycled materials. | • Creating a range of different shaped frame structures.<br>• Making a variety of free-standing frame structures of different shapes and sizes.<br>• Selecting appropriate materials to build a strong structure and cladding.<br>• Reinforcing corners to strengthen a structure. | • Making a range of different shaped beam bridges.<br>• Using triangles to create truss bridges that span a given distance and support a load.<br>• Building a wooden bridge structure.<br>• Independently measuring and marking wood accurately.<br>• Selecting appropriate tools and equipment for particular tasks. | • Building a range of play apparatus structures drawing upon new and prior knowledge of structures.<br>• Measuring, marking and cutting wood to create a range of structures.<br>• Using a range of materials to reinforce and add decoration to structures. |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | • Creating a design in accordance with a plan.<br>• Learning to create different textural effects with materials. | • Using the correct techniques to saws safely.<br>• Identifying where a structure needs reinforcement and using card corners for support.<br>• Explaining why selecting appropriating materials is an important part of the design process.<br>• Understanding basic wood functional properties. | |
| | Evaluate | • Giving a verbal evaluation of their own and others' junk models with adult support.<br>• Checking to see if their model matches their plan.<br>• Considering what they would do differently if they were to do it again.<br>• Describing their favourite and least favourite part of their model. | • Making predictions about, and evaluating different materials to see if they are waterproof.<br>• Making predictions about, and evaluating existing boats to see which floats best.<br>• Testing their design and reflecting on what could have been done differently.<br>• Investigating the how the shapes and structure of a boat affect the way it moves. | • Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't.<br>• Suggest points for improvements. | • Exploring the features of structures.<br>• Comparing the stability of different shapes.<br>• Testing the strength of own structures.<br>• Identifying the weakest part of a structure.<br>• Evaluating the strength, stiffness and stability of own structure. | • Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison, to the original design.<br>• Suggesting points for modification of the individual designs. | • Evaluating structures made by the class.<br>• Describing what characteristics of a design and construction made it the most effective.<br>• Considering effective and ineffective designs. | • Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary.<br>• Suggesting points for improvements for own bridges and those designed by others. | esign plan based on<br>on.<br>dapting a design to<br>it is developed.<br>hat makes a successful |
| Knowledge | Technical | • To know there are a range to different materials that can be used to make a model and that they are all slightly different. | • To know that 'waterproof' materials are those which do not absorb water. | • To understand that the shape of materials can be changed to improve the strength and stiffness of structures. | • To know that shapes and structures with wide, flat bases or legs are the most stable. | • To understand that wide and flat based objects are more stable.<br>• To understand the importance of strength and | • To understand what a frame structure is.<br>• To know that a 'free-standing' structure is one | • To understand some different ways to reinforce structures.<br>• To understand how triangles can | • To know that structures can be strengthened by manipulating materials and shapes. |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | • Making simple suggestions to fix their junk model. | | • To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).<br>• To understand that axles are used in structures and mechanisms to make parts turn in a circle.<br>• To begin to understand that different structures are used for different purposes.<br>• To know that a structure is something that has been made and put together. | • To understand that the shape of a structure affects its strength.<br>• To know that materials can be manipulated to improve strength and stiffness.<br>• To know that a structure is something which has been formed or made from parts.<br>• To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.<br>• To know that a 'strong' structure is one which does not break easily.<br>• To know that a 'stiff' structure or material is one which does not bend easily. | stiffness in structures. | which can stand on its own. | be used to reinforce bridges.<br>• To know that properties are words that describe the form and function of materials.<br>• To understand why material selection is important based on properties.<br>• To understand the material (functional and aesthetic) properties of wood. | |
| | Additional | | • To know that some objects float and others sink.<br>• To know the different parts of a boat. | • To know that a client is the person I am designing for.<br>• To know that design criteria is a list of points to ensure the product meets the needs and wants of the client.<br>• To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or | • To know that natural structures are those found in nature.<br>• To know that man-made structures are those made by people. | • To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose.<br>• To know that a façade is the front of a structure.<br>• To understand that a castle needed to be strong and stable to withstand enemy attack. | • To know that a pavilion is a a decorative building or structure for leisure activities.<br>• To know that cladding can be applied to structures for different effects.<br>• To know that aesthetics are how a product looks.<br>• To know that a product's function means its purpose. | • To understand the difference between arch, beam, truss and suspension bridges.<br>• To understand how to carry and use a saw safely. | • To understand what a 'footprint plan' is.<br>• To understand that in the real world, design , can impact users in positive and negative ways.<br>• To know that a prototype is a cheap model to test a design idea. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | generating electricity.<br>• To know that windmill turbines use wind to turn and make the machines inside work.<br>• 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 know that a paper net is a flat 2D shape that can become a 3D shape once assembled.<br>• To know that a design specification is a list of success criteria for a product. | • To understand that the target audience means the person or group of people a product is designed for.<br>• To know that architects consider light, shadow and patterns when designing. | | |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| Design and Technology – Mechanisms/Mechanical Systems (Following the Kapow Scheme of Work) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Year 1 | | Year 2 | | Year 3 | Year 4 | Year 5 | Year 6 |
| Unit title | | Making a moving story book | Wheels and axels | Fairground wheel | Making a moving monster | Pneumatic toys | Making a slingshot car | Pop-up book | Automata toys |
| Skills | Design | • Explaining how to adapt mechanisms, using bridges or guides to control the movement.<br>• Designing a moving story book for a given audience. | • Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move. • Creating clearly labelled drawings that illustrate movement. | • Selecting a suitable linkage system to produce the desired motion.<br>• Designing a wheel. | • Creating a class design criterion for a moving monster.<br>• Designing a moving monster for a specific audience in accordance with a design criterion. | • Designing a toy which uses a pneumatic system.<br>• Developing design criteria from a design brief.<br>• Generating ideas using thumbnail sketches and exploded diagrams.<br>• Learning that different types of drawings are used in design to explain ideas clearly. | • Designing a shape that reduces air resistance.<br>• Drawing a net to create a structure from.<br>• Choosing shapes that increase or decrease speed as a result of air resistance.<br>• Personalising a design. | • Designing a pop-up book which uses a mixture of structures and mechanisms.<br>• Naming each mechanism, input and output accurately.<br>• Storyboarding ideas for a book. | •Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement.<br>• Understanding how linkages change the direction of a force.<br>• Making things move at the same time.<br>• Understanding and drawing cross-sectional diagrams to show the inner-workings of my design. |
| | Make | • Following a design to create moving models that use levers and sliders. | Adapting mechanisms, when:<br>• they do not work as they should<br>• To fit their vehicle design.<br>• To improve how they work after testing their vehicle. | • Selecting materials according to their characteristics.<br>• Following a design brief. | • Making linkages using card for levers and split pins for pivots.<br>• Experimenting with linkages adjusting the widths, lengths and thicknesses of card used.<br>• Cutting and assembling components neatly. | • Creating a pneumatic system to create a desired motion.<br>• Building secure housing for a pneumatic system.<br>• Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy.<br>• Selecting materials due to their | • Measuring, marking, cutting and assembling with increasing accuracy.<br>• Making a model based on a chosen design. | • Following a design brief to make a pop-up book, neatly and with focus on accuracy.<br>• Making mechanisms and/or structures using sliders, pivots and folds to produce movement.<br>• Using layers and spacers to hide the workings of mechanical parts for | • Measuring, marking and checking the accuracy of the jelutong and dowel pieces required.<br>• Measuring, marking and cutting components accurately using a ruler and scissors.<br>• Assembling components accurately to make a stable frame. |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | functional and aesthetic characteristics.<br>• Manipulating materials to create different effects by cutting, creasing, folding and weaving. | | an aesthetically pleasing result. | • Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles.<br>• Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set. |
| | Evaluate | • Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed.<br>• Reviewing the success of a product by testing it with its intended audience. | • Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move. | • Evaluating different designs.<br>• Testing and adapting a design. | • Evaluating own designs against design criteria.<br>• Using peer feedback to modify a final design. | • Using the views of others to improve designs.<br>• Testing and modifying the outcome, suggesting improvements.<br>• Understanding the purpose of exploded-diagrams through the eyes of a designer and their client. | • Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance. | • Evaluating the work of others and receiving feedback on own work.<br>• Suggesting points for improvement. | • Evaluating the work of others and receiving feedback on own work.<br>• Applying points of improvement to their toys.<br>• Describing changes, they would make/do if they were to do the project again. |
| Knowledge | Technical | • To know that a mechanism is the parts of an object that move together.<br>•To know that a slider mechanism moves an object from side to side.<br>• To know that a slider mechanism has a slider, slots , guides and an object.<br>• To know that bridges and guides are bits of card that purposefully restrict the movement of the slider. | • To know that wheels need to be round to rotate and move.<br>• To understand that for a wheel to move it must be attached to a rotating axle.<br>• To know that an axle moves within an axle holder which is fixed to the vehicle or toy. • To know that the frame of a vehicle (chassis) needs to be balanced. | • To know that different materials have different properties and are therefore suitable for different uses. | • To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.<br>• To know that there is always an input and output in a mechanism.<br>• To know that an input is the energy that is used to start something working.<br>• To know that an output is the movement that | • To understand how pneumatic systems, work.<br>• To understand that pneumatic systems can be used as part of a mechanism. • To know that pneumatic systems operate by drawing in, releasing and compressing air. | • To understand that all moving things have kinetic energy.<br>• To understand that kinetic energy is the energy that something (object/person) has by being in motion.<br>• To know that air resistance is the level of drag on an object as it is forced through the air.<br>• To understand that the shape of a | • To know that mechanisms control movement.<br>• To understand that mechanisms can be used to change one kind of motion into another.<br>• To understand how to use sliders, pivots and folds to create paper-based mechanisms. | • To understand that the mechanism in an automata uses a system of cams, axles and followers.<br>• To understand that different shaped cams produce different outputs. |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | happens as a result of the input.<br>• To know that a lever is something that turns on a pivot.<br>• To know that a linkage mechanism is made up of a series of levers. | | moving object will affect how it moves due to air resistance. | | |
| | Additional | • To know that in Design and technology we call a plan a 'design'. | • To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles. | • To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.<br>• To know that it is important to test my design as I go along so that I can solve any problems that may occur. | • To know some real-life objects that contain mechanisms. | • To understand how sketches, drawings and diagrams can be used to communicate design ideas.<br>• To know that exploded-diagrams are used to show how different parts of a product fit together.<br>• To know that thumbnail sketches are small drawings to get ideas down on paper quickly. | • To understand that products change and evolve over time.<br>• To know that aesthetics means how an object or product looks in design and technology.<br>• To know that a template is a stencil you can use to help you draw the same shape accurately.<br>• To know that a birds-eye view means a view from a high angle (as if a bird in flight).• To know that graphics are images which are designed to explain or advertise something.<br>•To know that it is important to assess and evaluate design ideas and models against a list of design criteria. | • To know that a design brief is a description of what I am going to design and make.<br>• To know that designers often want to hide mechanisms to make a product more aesthetically pleasing. | • To know that an automata is a hand powered mechanical toy.<br>• To know that a cross-sectional diagram shows the inner workings of a product.<br>• To understand how to use a bench hook and saw safely.<br>• To know that a set square can be used to help mark 90° angles. |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| Design and Technology – Electrical Systems (Key Stage 2 only)<br>(Following the Kapow Scheme of Work) | | | | | |
|---|---|---|---|---|---|
| | | Year 3 | Year 4 | Year 5 | Year 6 |
| Unit title | | Electric poster | Torches | Doodlers | Steady hand games |
| Skills | Design | • Carry out research based on a given topic (e.g. The Romans) to develop a range of initial ideas.<br>• Generate a final design for the electric poster with consideration to the client's needs and design criteria.<br>• Design an electric poster that fits the requirements of a given brief.<br>• Plan the positioning of the bulb (circuit component) and its purpose. | • Designing a torch, considering the target audience and creating both design and success criteria focusing on features of individual design ideas. | • Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product.<br>• Developing design criteria based on findings from investigating existing products.<br>• Developing design criteria that clarifies the target user. | • Designing a steady hand game - identifying and naming the components required.<br>• Drawing a design from three different perspectives.<br>• Generating ideas through sketching and discussion.<br>• Modelling ideas through prototypes.<br>• Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'. |
| | Make | • Create a final design for the electric poster.<br>• Mount the poster onto corrugated card to improve its strength and allow it to withstand the weight of the circuit on the rear.<br>• Measure and mark materials out using a template or ruler.<br>• Fit an electrical component (bulb).<br>• Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge). | • Making a torch with a working electrical circuit and switch.<br>• Using appropriate equipment to cut and attach materials.<br>• Assembling a torch according to the design and success criteria. | • Altering a product's form and function by tinkering with its configuration.<br>• Making a functional series circuit, incorporating a motor.<br>• Constructing a product with consideration for the design criteria.<br>• Breaking down the construction process into steps so that others can make the product. | • Constructing a stable base for a game.<br>• Accurately cutting, folding and assembling a net.<br>• Decorating the base of the game to a high quality finish.<br>• Making and testing a circuit.<br>• Incorporating a circuit into a base. |
| | Evaluate | • Learning to give and accept constructive criticism on own work and the work of others.<br>• Testing the success of initial ideas against the design criteria and justifying opinions.<br>• Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs. | • Evaluating electrical products.<br>• Testing and evaluating the success of a final product. | • Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses.<br>• Determining which parts of a product affect its function and which parts affect its form.<br>• Analysing whether changes in configuration positively or negatively affect an existing product.<br>• Peer evaluating a set of instructions to build a product. | • Testing own and others finished games, identifying what went well and making suggestions for improvement.<br>• Gathering images and information about existing children's toys.<br>• Analysing a selection of existing children's toys. |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| | | | | | |
|---|---|---|---|---|---|
| Knowledge | Technical | • To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit.<br>• To understand common features of an electric product (switch, battery or plug, dials, buttons etc.).<br>• To list examples of common electric products (kettle, remote control etc.).<br>• To understand that an electric product uses an electrical system to work (function).<br>• To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits. | • To understand that electrical conductors are materials which electricity can pass through.<br>• To understand that electrical insulators are materials which electricity cannot pass through.<br>• To know that a battery contains stored electricity that can be used to power products.<br>• To know that an electrical circuit must be complete for electricity to flow.<br>• To know that a switch can be used to complete and break an electrical circuit. | • To know that series circuits only have one direction for the electricity to flow.<br>• To know when there is a break in a series circuit, all components turn off.<br>• To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.<br>• To know a motorised product is one which uses a motor to function. | • To know that batteries contain acid, which can be dangerous if they leak.<br>• To know the names of the components in a basic series circuit, including a buzzer. |
| | Additional | • To understand the importance and purpose of information design.<br>• To understand how material choices (such as mounting paper to corrugated card) can improve a product to serve its purpose (remain rigid without bending when the electrical circuit is attached). | • To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens.<br>• To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison. | • To know that product analysis is critiquing the strengths and weaknesses of a product.<br>• To know that 'configuration' means how the parts of a product are arranged. | •To know that 'form' means the shape and appearance of an object.<br>•To know the difference between 'form' and 'function'.<br>•To understand that 'fit for purpose' means that a product works how it should and is easy to use.<br>• To know that form over purpose means that a product looks good but does not work very well.<br>• To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind.<br>• To understand the diagram perspectives 'top view', 'side view' and 'back'. |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| Design and Technology – Food (Following the Kapow Scheme of Work) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Unit title | | Soup | Fruit and vegetables | A balanced diet | Eating seasonally | Adapting a recipe | What could be heathier? | Come dine with me |
| Skills | Design | • Designing a soup recipe as a class.<br>• Designing soup packaging. | • Designing smoothie carton packaging by-hand or on ICT software. | • Designing a healthy wrap based on a food combination which work well together. | • Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish. | • Designing a biscuit within a given budget, drawing upon previous taste testing judgements. | • Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.<br>• Writing an amended method for a recipe to incorporate the relevant changes to ingredients.<br>• Designing appealing packaging to reflect a recipe. | • Writing a recipe, explaining the key steps, method and ingredients.<br>• Including facts and drawings from research undertaken. |
| | Make | • Chopping plasticine safely.<br>• Chopping vegetables with support. | • Chopping fruit and vegetables safely to make a smoothie. | • Slicing food safely using the bridge or claw grip.<br>• Constructing a wrap that meets a design brief. | • Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination.<br>• Following the instructions within a recipe. | • Following a baking recipe, from start to finish, including the preparation of ingredients.<br>• Cooking safely, following basic hygiene rules.<br>• Adapting a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet). | • Cutting and preparing vegetables safely.<br>• Using equipment safely, including knives, hot pans and hobs.<br>• Knowing how to avoid cross-contamination.<br>• Following a step by step method carefully to make a recipe. | • Following a recipe, including using the correct quantities of each ingredient.<br>• Adapting a recipe based on research.<br>• Working to a given timescale.<br>• Working safely and hygienically with independence. |
| | Evaluate | • Tasting the soup and giving opinions.<br>• Describing some of the following when tasting food: look, feel, smell and taste.<br>• Choosing their favourite packaging | • Tasting and evaluating different food combinations.<br>• Describing appearance, smell and taste.<br>• Suggesting information to be | • Describing the taste, texture and smell of fruit and vegetables.<br>• Taste testing food combinations and final products. | • Establishing and using design criteria to help test and review dishes.<br>• Describing the benefits of seasonal fruits and vegetables | • Evaluating a recipe, considering: taste, smell, texture and appearance.<br>• Describing the impact of the budget on the selection of ingredients. | • Identifying the nutritional differences between different products and recipes.<br>• Identifying and describing healthy benefits of food groups. | • Evaluating a recipe, considering: taste, smell, texture and origin of the food group.<br>• Taste testing and scoring final products. |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | design and explaining why. | included on packaging. | • Describing the information that should be included on a label.<br>• Evaluating which grip was most effective. | and the impact on the environment.<br>• Suggesting points for improvement when making a seasonal tart. | • Evaluating and comparing a range of food products.<br>• Suggesting modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins). | | • Suggesting and writing up points of improvements when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process.<br>• Evaluating health and safety in production to minimise cross contamination. |
| Knowledge | Cooking and nutrition | • Tasting the soup and giving opinions.<br>• Describing some of the following when tasting food: look, feel, smell and taste.<br>• Choosing their favourite packaging design and explaining why. | • Tasting and evaluating different food combinations.<br>• Describing appearance, smell and taste.<br>• Suggesting information to be included on packaging. | • Describing the taste, texture and smell of fruit and vegetables.<br>• Taste testing food combinations and final products.<br>• Describing the information that should be included on a label.<br>• Evaluating which grip was most effective. | • To know that not all fruits and vegetables can be grown in the UK.<br>• To know that climate affects food growth.<br>• To know that vegetables and fruit grow in certain seasons.<br>• To know that cooking instructions are known as a 'recipe'.<br>• To know that imported food is food which has been brought into the country.<br>• To know that exported food is food which has been sent to another country.<br>• To understand that imported foods travel from far away and this can negatively impact the environment. | • To know that the amount of an ingredient in a recipe is known as the 'quantity.'<br>• To know that it is important to use oven gloves when removing hot food from an oven.<br>• To know the following cooking techniques: sieving, creaming, rubbing method, cooling.<br>•To understand the importance of budgeting while planning ingredients for biscuits. | • To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues.<br>• To know that I can adapt a recipe to make it healthier by substituting ingredients.<br>• To know that I can use a nutritional calculator to see how healthy a food option is.<br>• To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects. | • To know that 'flavour' is how a food or drink tastes.<br>• To know that many countries have 'national dishes' which are recipes associated with that country.<br>• To know that 'processed food' means food that has been put through multiple changes in a factory.<br>• To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides.<br>• To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork). |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | • To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre.<br>• To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health.<br>• To know safety rules for using, storing and cleaning a knife safely.<br>• To know that similar coloured fruits and vegetables often have similar nutritional benefits. | | | |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| Design and Technology - Textiles (Following the Kapow Scheme of Work) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Unit title | | Bookmarks | Puppets | Pouches | Cross-stitch and applique | Fastenings | Stuffed toys | Waistcoats |
| Skills | Design | • Discussing what a good design need.<br>• Designing a simple pattern with paper.<br>• Designing a bookmark.<br>• Choosing from available materials. | • Using a template to create a design for a puppet. | • Designing a pouch. | • Designing and making a template from an existing cushion and applying individual design criteria. | • Writing design criteria for a product, articulating decisions made.<br>• Designing a personalised book sleeve. | • Designing a stuffed toy, considering the main component shapes required and creating an appropriate template.<br>• Considering the proportions of individual components. | • Designing a waistcoat in accordance to a specification linked to set of design criteria.<br>• Annotating designs, to explain their decisions. |
| | Make | • Developing fine motor/cutting skills with scissors.<br>• Exploring fine motor/threading and weaving (under, over technique) with a variety of materials.<br>• Using a prepared needle and wool to practise threading. | • Cutting fabric neatly with scissors.<br>• Using joining methods to decorate a puppet.<br>• Sequencing steps for construction. | • Selecting and cutting fabrics for sewing.<br>• Decorating a pouch using fabric glue or running stitch.<br>• Threading a needle.<br>• Sewing running stitch, with evenly spaced, neat, even stitches to join fabric.<br>• Neatly pinning and cutting fabric using a template. | •Following design criteria to create a cushion or Egyptian collar.<br>•Selecting and cutting fabrics with ease using fabric scissors.<br>•Threading needles with greater independence.<br>•Tying knots with greater independence.<br>•Sewing cross stitch to join fabric.<br>•Decorating fabric using appliqué.<br>•Completing design ideas with stuffing and sewing the edges (Cushions) ***or*** embellishing the collars based on design ideas (Egyptian collars). | • Making and testing a paper template with accuracy and in keeping with the design criteria.<br>• Measuring, marking and cutting fabric using a paper template.<br>• Selecting a stitch style to join fabric.<br>• Working neatly by sewing small, straight stitches.<br>• Incorporating a fastening to a design. | • Creating a 3D stuffed toy from a 2D design.<br>• Measuring, marking and cutting fabric accurately and independently .<br>• Creating strong and secure blanket stitches when joining fabric.<br>• Threading needles independently.<br>• Using appliqué to attach pieces of fabric decoration.<br>• Sewing blanket stitch to join fabric.<br>• Applying blanket stitch so the spaces between the stitches are even and regular. | • Using a template when cutting fabric to ensure they achieve the correct shape.<br>• Using pins effectively to secure a template to fabric without creases or bulges.<br>• Marking and cutting fabric accurately, in accordance with their design.<br>• Sewing a strong running stitch, making small, neat stitches and following the edge.<br>• Tying strong knots.<br>• Decorating a waistcoat, attaching features (such as appliqué) using thread.<br>• Finishing the waistcoat with a secure fastening (such as buttons). |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | • Learning different decorative stitches.<br>• Sewing accurately with evenly spaced, neat stitches. |
| | Evaluate | • Reflecting on a finished product and comparing to their design. | • Reflecting on a finished product, explaining likes and dislikes. | • Troubleshooting scenarios posed by teacher.<br>• Evaluating the quality of the stitching on others' work.<br>• Discussing as a class, the success of their stitching against the success criteria.<br>• Identifying aspects of their peers' work that they particularly like and why. | • Evaluating an end product and thinking of other ways in which to create similar items. | • Testing and evaluating an end product against the original design criteria.<br>• Deciding how many of the criteria should be met for the product to be considered successful.<br>• Suggesting modifications for improvement.<br>• Articulating the advantages and disadvantages of different fastening types. | • Testing and evaluating an end product and giving point for further improvements. | • Reflecting on their work continually throughout the design, make and evaluate process. |
| Knowledge | | • To know that a design is a way of planning our idea before we start.<br>• To know that threading is putting one material through an object. | • To know that 'joining technique' means connecting two pieces of material together.<br>• To know that there are various temporary methods of joining fabric by using staples. glue or pins.<br>• To understand that different techniques for joining materials can be used for different purposes.<br>• To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.<br>• To know that drawing a design idea is useful to see how an idea will look. | • To know that sewing is a method of joining fabric.<br>• To know that different stitches can be used when sewing.<br>• To understand the importance of tying a knot after sewing the final stitch.<br>• To know that a thimble can be used to protect my fingers when sewing. | •To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces.<br>•To know that when two edges of fabric have been joined together it is called a seam.<br>•To know that it is important to leave space on the fabric for the seam.<br>•To understand that some products are turned inside out after sewing so the stitching is hidden. | • To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro.<br>• To know that different fastening types are useful for different purposes.<br>• To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions. | • To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric.<br>• To understand that it is easier to finish simpler designs to a high standard.<br>• To know that soft toys are often made by creating appendages separately and then attaching them to the main body.<br>• 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. | • To understand that it is important to design clothing with the client/ target customer in mind.<br>• To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.<br>• To understand the importance of consistently sized stitches. |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| Design and Technology – Digital World (Key Stage 2 only)<br>(Following the Kapow Scheme of Work) | | | | | |
|---|---|---|---|---|---|
| | | Year 3 | Year 4 | Year 5 | Year 6 |
| Unit title | | Electronic charm | Mindful moments timer | Monitoring devices | Navigating the world |
| Skills | Design | • Problem solving by suggesting potential features on a Micro: bit and justifying my ideas.<br>• Developing design ideas for a technology pouch.<br>• Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge. | • Writing design criteria for a programmed timer (Micro:bit).<br>• Exploring different mindfulness strategies.<br>• Applying the results of my research to further inform my design criteria.<br>• Developing a prototype case for my mindful moment timer.<br>• Using and manipulating shapes and clipart by using computer-aided design (CAD), to produce a logo.<br>• Following a list of design requirements. | • Researching (books, internet) for a particular (user's) animal's needs.<br>• Developing design criteria based on research.<br>• Generating multiple housing ideas using building bricks.<br>• Understanding what a virtual model is and the pros and cons of traditional and CAD modelling.<br>• Placing and manoeuvring 3D objects, using CAD.<br>• Changing the properties of, or combining one or more 3D objects, using CAD. | • Writing a design brief from information submitted by a client.<br>• Developing design criteria to fulfil the client's request.<br>• Considering and suggesting additional functions for my navigation tool.<br>• Developing a product idea through annotated sketches.<br>• Placing and manoeuvring 3D objects, using CAD.<br>• Changing the properties of, or combining one or more 3D objects, using CAD. |
| | Make | • Using a template when cutting and assembling the pouch.<br>• Following a list of design requirements.<br>• Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch.<br>• Applying functional features such as using foam to create soft buttons.<br>• Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm. | • Developing a prototype case for my mindful moment timer.<br>• Creating a 3D structure using a net.<br>• Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press. | • Understanding the functional and aesthetic properties of plastics.<br>• Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range. | • Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo).<br>• Explaining material choices and why they were chosen as part of a product concept.<br>• Programming an N,E, S, W cardinal compass. |
| | Evaluate | • Analysing and evaluating an existing product.<br>• Identifying the key features of a pouch. | • Investigating and analysing a range of timers by identifying and comparing their advantages and disadvantages.<br>• Evaluating my Micro:bit program against points on my design criteria and amending them to include any changes I made.<br>• Documenting and evaluating my project. | • Stating an event or fact from the last 100 years of plastic history.<br>• Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices.<br>• Explaining key functions in my program (audible alert, visuals). | • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool.<br>• Developing an awareness of sustainable design.<br>• Identifying key industries that utilise 3D CAD modelling and explaining why.<br>• Describing how the product concept fits the client's request and how it will benefit the customers. |

# Woodloes Primary School Design and Technology Skills and Knowledge Progression

| | | | | | |
|---|---|---|---|---|---|
| | | | • Understanding what a logo is and why they are important in the world of design and business.<br>• Testing my program for bugs (errors in the code).<br>• Finding and fixing the bugs (debug) in my code. | • Explaining how my product would be useful for an animal carer including programmed features. | • Explaining the key functions in my program, including any additions.<br>• Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool.<br>• Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch.<br>• Demonstrating a functional program as part of a product concept pitch. |
| Knowledge | Technical | • To understand that, in programming, a 'loop' is code that repeats something again and again until stopped.<br>• To know that a Micro:bit is a pocket-sized, codeable computer. | • To understand what variables are in programming.<br>• To know some of the features of a Micro:bit.<br>• To know that an algorithm is a set of instructions to be followed by the computer.<br>• To know that it is important to check my code for errors (bugs).<br>• To know that a simulator can be used as a way of checking your code works before installing it onto an electronic device. | • To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record.<br>• To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose.<br>• To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met. | • To know that accelerometers can detect movement.<br>• To understand that sensors can be useful in products as they mean the product can function without human input. |
| | Additional | •To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result.<br>•To know that in Design and technology the term 'smart' means a programmed product.<br>•To know the difference between analogue and digital technologies.<br>• To understand what is meant by 'point of sale display.'<br>• To know that CAD stands for 'Computer-aided design'. | •To understand the terms 'ergonomic' and 'aesthetic'.<br>•To know that a prototype is a 3D model made out of cheap materials, that allows us to test design ideas and make better decisions about size, shape and materials. | • To understand key developments in thermometer history.<br>• To 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.<br>• To know the 6Rs of sustainability.<br>• To understand what a virtual model is and the pros and cons of traditional vs CAD modelling. | • To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request.<br>• To know that 'multifunctional' means an object or product has more than one function. • To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing. |