



Design and Technology Curriculum Map

Year 1

Taught in...	Unit of work	Intended learning (knowledge and skills)
	<p><u>Structures</u></p> <p>Constructing a windmill</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none">• To understand that the shape of materials can be changed to improve the strength and stiffness of structures.• To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).• To understand that axles are used in structures and mechanisms to make parts turn in a circle.• To begin to understand that different structures are used for different purposes.• To know that a structure is something that has been made and put together. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none">• 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. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none">• Learning the importance of a clear design criteria.• Including individual preferences and requirements in a design. <p>Make</p> <ul style="list-style-type: none">• Making stable structures from card, tape and glue .• 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.

		<p>Evaluate</p> <ul style="list-style-type: none"> • Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't. • Suggest points for improvements.
	<p><u>Mechanisms/ mechanical systems</u></p> <p>Making a moving storybook</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To know that a mechanism is the parts of an object that move together. • To know that a slider mechanism moves an object from side to side. • To know that a slider mechanism has a slider, slots, guides and an object. • To know that bridges and guides are bits of card that purposefully restrict the movement of the slider. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To know that in Design and technology we call a plan a 'design'. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Explaining how to adapt mechanisms, using bridges or guides to control the movement. • Designing a moving story book for a given audience. <p>Make</p> <ul style="list-style-type: none"> • Following a design to create moving models that use levers and sliders. <p>Evaluate</p> <ul style="list-style-type: none"> • 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.
	<p><u>Mechanisms/ mechanical systems</u></p> <p>Wheels and axles</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To know that wheels need to be round to rotate and move. • To understand that for a wheel to move it must be attached to a rotating axle. • 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. <p><u>Additional knowledge</u></p>

- To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles

Skills

Design

- 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.

Make

- Adapting mechanisms, when:
 - they do not work as they should.
 - to fit their vehicle design.
 - to improve how they work after testing their vehicle.

Evaluate

- 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.

	<p><u>Food</u></p> <p>Fruit and vegetables</p>	<p><u>Cooking and nutrition knowledge</u></p> <ul style="list-style-type: none"> • Understanding the difference between fruits and vegetables. • To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber). • To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds and a vegetable does not. • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber). <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Designing smoothie carton packaging by-hand or on ICT software. <p>Make</p> <ul style="list-style-type: none"> • Chopping fruit and vegetables safely to make a smoothie. <p>Evaluate</p> <ul style="list-style-type: none"> • Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Suggesting information to be included on packaging.
	<p><u>Textiles</u></p> <p>Puppets</p> <p>This unit's theme is based on the children choosing a storybook</p>	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> • To know that 'joining technique' means connecting two pieces of material together. • To know that there are various temporary methods of joining fabric by using staples, glue or pins. • 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 drawing a design idea is useful to see how an idea will look. <p><u>Skills</u></p>

	<p>character to base their puppet designs on. For guidance on adapting the unit to the theme 'Easter animals', please visit the alternative theme page in the lesson outline.</p>	<p>Design</p> <ul style="list-style-type: none"> • Using a template to create a design for a puppet. <p>Make</p> <ul style="list-style-type: none"> • Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction. <p>Evaluate</p> <ul style="list-style-type: none"> • Reflecting on a finished product, explaining likes and dislikes.
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Year 2

Taught in...	Unit of work	Intended learning (knowledge and skills)
	<p><u>Structures</u></p> <p>Baby bear's chair</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To know that shapes and structures with wide, flat bases or legs are the most stable. • To understand that the shape of a structure affects its strength. • To know that materials can be manipulated to improve strength and stiffness. • To know that a structure is something which has been formed or made from parts. • To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. • To know that a 'strong' structure is one which does not break easily. • To know that a 'stiff' structure or material is one which does not bend easily. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To know that natural structures are those found in nature. • To know that man-made structures are those made by people. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Generating and communicating ideas using sketching and modelling. • Learning about different types of structures, found in the natural world and in everyday objects

		<p>Make</p> <ul style="list-style-type: none"> • 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. <p>Evaluate</p> <ul style="list-style-type: none"> • Exploring the features of structures. • Comparing the stability of different shapes. • Testing the strength of own structures. • Identifying the weakest part of a structure. • Evaluating the strength, stiffness and stability of own structure.
	<p><u>Mechanisms/ mechanical structures</u></p> <p>Fairground wheel</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To know that different materials have different properties and are therefore suitable for different uses. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder. • To know that it is important to test my design as I go along so that I can solve any problems that may occur. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Selecting a suitable linkage system to produce the desired motion. • Designing a wheel. <p>Make</p> <ul style="list-style-type: none"> • Selecting materials according to their characteristics. • Following a design brief. <p>Evaluate</p> <ul style="list-style-type: none"> • Evaluating different designs. • Testing and adapting a design.

	<p><u>Mechanisms/ mechanical structures</u></p> <p>Making a moving monster</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • To know that there is always an input and output in a mechanism. • To know that an input is the energy that is used to start something working. • To know that an output is the movement that happens as a result of the input. • To know that a lever is something that turns on a pivot. • To know that a linkage mechanism is made up of a series of levers. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To know some real-life objects that contain mechanisms. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria. <p>Make</p> <ul style="list-style-type: none"> • Making linkages using card for levers and split pins for pivots. • Experimenting with linkages adjusting the widths, lengths and thicknesses of card used. • Cutting and assembling components neatly. <p>Evaluate</p> <ul style="list-style-type: none"> • Evaluating own designs against design criteria. • Using peer feedback to modify a final design.
	<p><u>Food</u></p> <p>A balanced diet</p>	<p><u>Cooking and nutrition knowledge</u></p> <ul style="list-style-type: none"> • 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 where to find the nutritional information on packaging. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • 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 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.

		<ul style="list-style-type: none"> • 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'. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Designing a healthy wrap based on a food combination which work well together. <p>Make</p> <ul style="list-style-type: none"> • Slicing food safely using the bridge or claw grip. • Constructing a wrap that meets a design brief. <p>Evaluate</p> <ul style="list-style-type: none"> • Describing the taste, texture and smell of fruit and vegetables. • Taste testing food combinations and final products. • Describing the information that should be included on a label. • Evaluating which grip was most effective.
	<p><u>Textiles</u></p> <p>Pouches</p>	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> • To know that sewing is a method of joining fabric. • To know that different stitches can be used when sewing. • 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. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Designing a pouch. <p>Make</p> <ul style="list-style-type: none"> • 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. • Neatly pinning and cutting fabric using a template. <p>Evaluate</p>

- Troubleshooting scenarios posed by teacher.
- Evaluating the quality of the stitching on others' work.
- 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.

Year 3

Taught in...	Unit of work	Intended learning (knowledge and skills)
	<p><u>Structures</u></p> <p>Constructing a castle</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • 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. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • 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 and/or decorating a castle tower on CAD software. <p>Make</p> <ul style="list-style-type: none"> • Constructing a range of 3D geometric shapes using nets. • Creating special features for individual designs. • Making facades from a range of recycled materials <p>Evaluate</p>

		<ul style="list-style-type: none"> • 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..
	<p><u>Mechanisms/ mechanical structures</u></p> <p>Pneumatic toys</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To understand how pneumatic systems work. • 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 <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To understand how sketches, drawings and diagrams can be used to communicate design ideas. • To know that exploded-diagrams are used to show how different parts of a product fit together. • To know that thumbnail sketches are small drawings to get ideas down on paper quickly. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • 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. <p>Make</p> <ul style="list-style-type: none"> • 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. • Selecting materials due to their functional and aesthetic characteristics. • Manipulating materials to create different effects by cutting, creasing, folding and weaving. <p>Evaluate</p> <ul style="list-style-type: none"> • 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.
	<p><u>Electrical systems</u></p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit.

	<p>Electric poster</p>	<ul style="list-style-type: none"> • To understand common features of an electric product (switch, battery or plug, dials, buttons etc.). • To list examples of common electric products (kettle, remote control etc.). • To understand that an electric product uses an electrical system to work (function). • To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To understand the importance and purpose of information design. • 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). <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Carry out research based on a given topic (e.g. The Romans) 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. <p>Make</p> <ul style="list-style-type: none"> • Create a final design for the electric poster. • Mount the poster onto corrugated card to improve its strength and allow it to 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). <p>Evaluate</p> <ul style="list-style-type: none"> • 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.
	<p><u>Food</u></p> <p>Eating seasonally</p>	<p><u>Cooking and nutrition knowledge</u></p> <ul style="list-style-type: none"> • To know that not all fruits and vegetables can be grown in the UK. • To know that climate affects food growth. • To know that vegetables and fruit grow in certain seasons. • To know that cooking instructions are known as a 'recipe'. • To know that imported food is food which has been brought into the country. • To know that exported food is food which has been sent to another country..

		<ul style="list-style-type: none"> • To understand that imported foods travel from far away and this can negatively impact the environment. • To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre. • To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health. • To know safety rules for using, storing and cleaning a knife safely. • To know that similar coloured fruits and vegetables often have similar nutritional benefits. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish. <p>Make</p> <ul style="list-style-type: none"> • Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination. • Following the instructions within a recipe. <p>Evaluate</p> <ul style="list-style-type: none"> • Establishing and using design criteria to help test and review dishes. • Describing the benefits of seasonal fruits and vegetables and the impact on the environment. • Suggesting points for improvement when making a seasonal tart.
	<p><u>Textiles</u></p> <p><i>Cross stitch and applique</i></p> <p><i>Cushions</i></p> <p>Having learnt the basics of sewing and decorating fabric in key stage one, this unit builds on the children's repertoire by</p>	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> • To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. • To know that when two edges of fabric have been joined together it is called a seam. • To know that it is important to leave space on the fabric for the seam. • To understand that some products are turned inside out after sewing so the stitching is hidden. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Designing and making a template from an existing cushion and applying individual design criteria. <p>Make</p> <ul style="list-style-type: none"> • Following design criteria to create a cushion or Egyptian collar.

	<p>introducing two new skills: cross-stitch and appliqué. After learning these techniques, the children apply their knowledge to the design, decoration and assembly of their very own Egyptian Usekh /Wesekh collars to represent their unique personalities.</p>	<ul style="list-style-type: none"> • Selecting and cutting fabrics with ease using fabric scissors. • Threading needles with greater independence. • Tying knots with greater independence. • Sewing cross stitch to join fabric. • Decorating fabric using appliqué. • Completing design ideas with stuffing and sewing the edges (Cushions) or embellishing the collars based on design ideas (Egyptian collars). <p>Evaluate</p> <ul style="list-style-type: none"> • Evaluating an end product and thinking of other ways in which to create similar items.
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Year 4

Taught in...	Unit of work	Intended learning (knowledge and skills)
	<p><u>Structures</u></p> <p>Pavilions</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To understand what a frame structure is. • To know that a 'free-standing' structure is one which can stand on its own. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To know that a pavilion is a a decorative building or structure for leisure activities. • To know that cladding can be applied to structures for different effects. • To know that aesthetics are how a product looks. • To know that a product's function means its purpose. • To understand that the target audience means the person or group of people a product is designed for. • To know that architects consider light, shadow and patterns when designing. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. • Building frame structures designed to support weight.

Make

- Creating a range of different shaped frame structures.
- Making a variety of free standing frame structures of different shapes and sizes.
- Selecting appropriate materials to build a strong structure and cladding.
- Reinforcing corners to strengthen a structure.
- Creating a design in accordance with a plan.
- Learning to create different textural effects with materials.

Evaluate

- Evaluating structures made by the class.
- Describing what characteristics of a design and construction made it the most effective.
- Considering effective and ineffective designs

**Mechanisms/
mechanical
systems****Making a slingshot
car****Technical knowledge**

- To understand that all moving things have kinetic energy.
- To understand that kinetic energy is the energy that something (object/person) has by being in motion.
- To know that air resistance is the level of drag on an object as it is forced through the air.
- To understand that the shape of a moving object will affect how it moves due to air resistance

Additional knowledge

- To understand that products change and evolve over time.
- To know that aesthetics means how an object or product looks in design and technology.
- To know that a template is a stencil you can use to help you draw the same shape accurately.
- 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.
- To know that it is important to assess and evaluate design ideas and models against a list of design criteria.

Skills**Design**

- Designing a shape that reduces air resistance.
- Drawing a net to create a structure from.
- Choosing shapes that increase or decrease speed as a result of air resistance.
- Personalising a design.

Make

		<ul style="list-style-type: none"> • Measuring, marking, cutting and assembling with increasing accuracy. • Making a model based on a chosen design. <p>Evaluate</p> <ul style="list-style-type: none"> • Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.
	<p><u>Electrical systems</u></p> <p>Torches</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To understand that electrical conductors are materials which electricity can pass through. • To understand that electrical insulators are materials which electricity cannot pass through. • To know that a battery contains stored electricity that can be used to power products. • To know that an electrical circuit must be complete for electricity to flow. • To know that a switch can be used to complete and break an electrical circuit. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. • To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. <p>Make</p> <ul style="list-style-type: none"> • Making a torch with a working electrical circuit and switch. • Using appropriate equipment to cut and attach materials. • Assembling a torch according to the design and success criteria. <p>Evaluate</p> <ul style="list-style-type: none"> • Evaluating electrical products. • Testing and evaluating the success of a final product

	<p><u>Food</u></p> <p>Adapting a recipe</p>	<p><u>Cooking and nutrition knowledge</u></p> <ul style="list-style-type: none"> • 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. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Designing a biscuit within a given budget, drawing upon previous taste testing judgements. <p>Make</p> <ul style="list-style-type: none"> • Following a baking recipe, from start to finish, including the preparation of ingredients. • Cooking safely, following basic hygiene rules. • Adapting a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet). <p>Evaluate</p> <ul style="list-style-type: none"> • 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 food products. • 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).
	<p><u>Textiles</u></p> <p>Fastenings</p>	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> • To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro. • 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.

		<p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Writing design criteria for a product, articulating decisions made. • Designing a personalised book sleeve. <p>Make</p> <ul style="list-style-type: none"> • 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 by sewing small, straight stitches. • Incorporating a fastening to a design. <p>Evaluate</p> <ul style="list-style-type: none"> • 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
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Year 5

Taught in...	Unit of work	Intended learning (knowledge and skills)
	<p><u>Structures</u></p> <p>Bridges</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • 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 properties. • To understand the material (functional and aesthetic) properties of wood. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To understand the difference between arch, beam, truss and suspension bridges. • To understand how to carry and use a saw safely. <p><u>Skills</u></p>

Design

- Designing a stable structure that is able to support weight.
- Creating a frame structure with a focus on triangulation.

Make

- Making a range of different shaped beam bridges.
- Using triangles to create truss bridges that span a given distance and support 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 saws 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.
- Understanding basic wood functional properties.

Evaluate

- 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.

**Mechanisms/
mechanical
systems**

Pop up book

Technical knowledge

- To know that mechanisms control movement.
- To understand that mechanisms can be used to change one kind of motion into another.
- To understand how to use sliders, pivots and folds to create paper-based mechanisms.

Additional knowledge

- To know that a design brief is a description of what I am going to design and make.
- To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.

Skills

Design

- Designing a pop-up book which uses a mixture of structures and mechanisms.
- Naming each mechanism, input and output accurately.
- Storyboarding ideas for a book.

Make

- Following a design brief to make a pop up book, neatly and with focus on accuracy.
- Making mechanisms and/or structures using sliders, pivots and folds to produce movement.
- Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.

Evaluate

- Evaluating the work of others and receiving feedback on own work.
- Suggesting points for improvement.

Electrical systems

Doodlers

Technical knowledge

- To know that series circuits only have one direction for the electricity to flow.
- To know when there is a break in a series circuit, all components turn off.
- To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.
- To know a motorised product is one which uses a motor to function.

Additional knowledge

- To know that product analysis is critiquing the strengths and weaknesses of a product.
- To know that 'configuration' means how the parts of a product are arranged.

Skills

Design

- Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product.
- Developing design criteria based on findings from investigating existing products.
- Developing design criteria that clarifies the target user.

Make

- Altering a product's form and function by tinkering with its configuration.
- Making a functional series circuit, incorporating a motor.
- Constructing a product with consideration for the design criteria.
- Breaking down the construction process into steps so that others can make the product.

Evaluate

		<ul style="list-style-type: none"> • Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. • Determining which parts of a product affect its function and which parts affect its form. • Analysing whether changes in configuration positively or negatively affect an existing product. • Peer evaluating a set of instructions to build a product.
	<p><u>Food</u></p> <p>What could be healthier?</p>	<p><u>Cooking and nutrition knowledge</u></p> <ul style="list-style-type: none"> • 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 know that I can use a nutritional calculator to see how healthy a food option is. • 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. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • 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. <p>Make</p> <ul style="list-style-type: none"> • Cutting and preparing vegetables safely. • Using equipment safely, including knives, hot pans and hobs. • Knowing how to avoid cross-contamination. • Following a step by step method carefully to make a recipe <p>Evaluate</p> <ul style="list-style-type: none"> • Identifying the nutritional differences between different products and recipes. • Identifying and describing healthy benefits of food groups.
	<p><u>Textiles</u></p> <p>Stuffed toys</p>	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> • 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.

		<ul style="list-style-type: none"> • 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. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Designing a stuffed toy, considering the main component shapes required and creating an appropriate template. • Considering the proportions of individual components. <p>Make</p> <ul style="list-style-type: none"> • 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 appliqué to attach pieces of fabric decoration. • Sewing blanket stitch to join fabric. • Applying blanket stitch so the spaces between the stitches are even and regular. <p>Evaluate</p> <ul style="list-style-type: none"> • Testing and evaluating an end product and giving point for further improvements.
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Year 6

Taught in...	Unit of work	Intended learning (knowledge and skills)
	<p><u>Structures</u></p> <p>Playgrounds</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To know that structures can be strengthened by manipulating materials and shapes. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To understand what a 'footprint plan' is. • To understand that in the real world, design , can impact users in positive and negative ways. • To know that a prototype is a cheap model to test a design idea. <p><u>Skills</u></p>

		<p>Design</p> <ul style="list-style-type: none"> • Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs. <p>Make</p> <ul style="list-style-type: none"> • Building a range of play apparatus structures drawing upon new and prior knowledge of structures. • Measuring, marking and cutting wood to create a range of structures. • Using a range of materials to reinforce and add decoration to structures. <p>Evaluate</p> <ul style="list-style-type: none"> • 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.
	<p><u>Mechanisms/ mechanical systems</u></p> <p>Automata toys</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • 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. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To know that an automata is a hand powered mechanical toy. • To know that a cross-sectional diagram shows the inner workings of a product. • To understand how to use a bench hook and saw safely. • To know that a set square can be used to help mark 90° angles. <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • 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-workings of my design. <p>Make</p> <ul style="list-style-type: none"> • Measuring, marking and checking the accuracy of the jelutong and dowel pieces required.

		<ul style="list-style-type: none"> • 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. <p>Evaluate</p> <ul style="list-style-type: none"> • Evaluating the work of others and receiving feedback on own work. • Applying points of improvement to their toys. • Describing changes they would make/do if they were to do the project again.
	<p><u>Electrical systems</u></p> <p>Steady hand game</p>	<p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> • To know that batteries contain acid, which can be dangerous if they leak. • To know the names of the components in a basic series circuit, including a buzzer. <p><u>Additional knowledge</u></p> <ul style="list-style-type: none"> • To know that 'form' means the shape and appearance of an object. • To know the difference between 'form' and 'function'.] • To understand that 'fit for purpose' means that a product works how it should and is easy to use. • To know that form over purpose means that a product looks good but does not work very well. • To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind. • To understand the diagram perspectives 'top view', 'side view' and 'back' <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Designing a steady hand game - identifying and naming the components required. • Drawing a design from three different perspectives. • Generating ideas through sketching and discussion. • Modelling ideas through prototypes. • Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'. <p>Make</p> <ul style="list-style-type: none"> • Constructing a stable base for a game.

		<ul style="list-style-type: none"> • Accurately cutting, folding and assembling a net. • Decorating the base of the game to a high quality finish. • Making and testing a circuit. • Incorporating a circuit into a base. <p>Evaluate</p> <ul style="list-style-type: none"> • Testing own and others finished games, identifying what went well and making suggestions for improvement. • Gathering images and information about existing children's toys. • Analysing a selection of existing children's toys.
	<p><u>Food</u></p> <p>Come dine with me</p>	<p><u>Cooking and nutrition knowledge</u></p> <ul style="list-style-type: none"> • To know that 'flavour' is how a food or drink tastes. • To know that many countries have 'national dishes' which are recipes associated with that country. • To know that 'processed food' means food that has been put through multiple changes in a factory. • To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. • To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork). <p><u>Skills</u></p> <p>Design</p> <ul style="list-style-type: none"> • Writing a recipe, explaining the key steps, method and ingredients. • Including facts and drawings from research undertaken. <p>Make</p> <ul style="list-style-type: none"> • 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. <p>Evaluate</p> <ul style="list-style-type: none"> • 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 when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process. • Evaluating health and safety in production to minimise cross contamination.
	<p><u>Textiles</u></p>	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> • To understand that it is important to design clothing with the client/ target customer in mind.

Waistcoats

- To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.
- To understand the importance of consistently sized stitches

Skills**Design**

- Designing a waistcoat in accordance to a specification linked to set of design criteria.
- Annotating designs, to explain their decisions.

Make

- Using a template when cutting fabric to ensure they achieve the correct shape.
- Using pins effectively to secure a template to fabric without creases or bulges.
- Marking and cutting fabric accurately, in accordance with their design.
- Sewing a strong running stitch, making small, neat stitches and following the edge. • Tying strong knots.
- Decorating a waistcoat, attaching features (such as appliqué) using thread.
- Finishing the waistcoat with a secure fastening (such as buttons).
- Learning different decorative stitches.
- Sewing accurately with evenly spaced, neat stitches.

Evaluate

- Reflecting on their work continually throughout the design, make and evaluate process.