



# Design and Technology Medium Term Plan

## 2023~2024



Year 1	Knowledge	Skills
<b>Autumn</b> <b>Making a moving story book</b> <b>(Mechanisms)</b>	Children will know: <ul style="list-style-type: none"><li>• a mechanism is the parts of an object that move together;</li><li>• a slider mechanism moves an object from side to side;</li><li>• a slider mechanism has a slider, slots, guides and an object;</li><li>• bridges and guides are bits of card that purposefully restrict the movement of the slider;</li><li>• that in Design and technology we call a plan a 'design'.</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• explain how to adapt mechanisms, using bridges or guides to control the movement;</li><li>• design a moving story book for a given audience;</li><li>• follow a design to create moving models that use levers and sliders;</li><li>• test a finished product, see whether it moves as planned and if not, explain why and how it can be fixed;</li><li>• review the success of a product by testing it with its intended audience.</li></ul>
<b>Spring</b> <b>Constructing a Windmill</b> <b>(Structures)</b>	Children will know: <ul style="list-style-type: none"><li>• the importance of a clear design criteria;</li><li>• the shape of materials can be changed to improve the strength and stiffness of structures;</li><li>• cylinders are a strong type of structure;</li><li>• axles are used in structures and mechanisms to make parts turn in a circle;</li><li>• different structures are used for different purposes;</li><li>• a structure is something that has been made and put together;</li><li>• a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity;</li><li>• windmill turbines use wind to turn and make the machines inside work;</li><li>• a windmill is a structure with sails that are moved by the wind;</li><li>• the three main parts of a windmill are the turbine, axle and structure.</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• including individual preferences and requirements in a design;</li><li>• make stable structures from card, tape and glue;</li><li>• turn 2D nets into 3D structures;</li><li>• follow instructions to cut and assemble the supporting structure of a windmill;</li><li>• make functioning turbines and axles which are assembled into a main supporting structure;</li><li>• evaluate a windmill according to the design criteria;</li><li>• test whether the structure is strong and stable and alter it if it isn't;</li><li>• suggest points for improvements.</li></ul>
<b>Summer</b> <b>Puppets</b> <b>(Textiles)</b>	Children will know: <ul style="list-style-type: none"><li>• 'joining technique' means connecting two pieces of material together;</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• use a template to create a design for a puppet;</li><li>• cut fabric neatly with scissors;</li></ul>



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	<ul style="list-style-type: none"><li>• there are various temporary methods of joining fabric by using staples, glue or pins;</li><li>• different techniques for joining materials can be used for different purposes;</li><li>• a template (or fabric pattern) is used to cut out the same shape multiple times;</li><li>• drawing a design idea is useful to see how an idea will look.</li></ul>	<ul style="list-style-type: none"><li>• use joining methods to decorate a puppet;</li><li>• sequence steps for construction;</li><li>• reflect on a finished product, explaining likes and dislikes.</li></ul>
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Year 2	Knowledge	Skills
<b>Autumn</b> <b>A Balanced Diet</b> <b>(Cooking and Nutrition)</b>	Children will know: <ul style="list-style-type: none"><li>• that 'diet' means the food and drink that a person or animal usually eats;</li><li>• what makes a balanced diet;</li><li>• where to find the nutritional information on packaging;</li><li>• what the five main food groups are;</li><li>• you should eat a range of different foods from each food group, and roughly how much of each food group;</li><li>• 'ingredients' means the items in a mixture or recipe;</li><li>• you should only have a maximum of five teaspoons of sugar a day to stay healthy;</li><li>• many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars';</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• design a healthy wrap based on a food combination which work well together;</li><li>• slice food safely using the bridge or claw grip;</li><li>• construct a wrap that meets a design brief;</li><li>• describe the taste, texture and smell of fruit and vegetables;</li><li>• taste testing food combinations and final products;</li><li>• describe the information that should be included on a label;</li><li>• evaluate which grip was most effective.</li></ul>
<b>Spring</b> <b>Making a moving animal</b> <b>(Mechanisms)</b>	Children will know: <ul style="list-style-type: none"><li>• mechanisms are a collection of moving parts that work together as a machine to produce movement;</li><li>• there is always an input and output in a mechanism;</li><li>• an input is the energy that is used to start something working;</li><li>• an output is the movement that happens as a result of the input;</li><li>• a lever is something that turns on a pivot;</li><li>• a linkage mechanism is made up of a series of levers.</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• design a moving for a specific audience in accordance with a design criteria;</li><li>• make linkages using card for levers and split pins for pivots;</li><li>• experiment with linkages adjusting the widths, lengths and thicknesses of card used;</li><li>• cut and assemble components neatly;</li><li>• evaluate their own designs against design criteria;</li><li>• use peer feedback to modify a final design.</li></ul>
<b>Summer</b> <b>Making a Chair</b> <b>(Structures)</b>	Children will know: <ul style="list-style-type: none"><li>• shapes and structures with wide, flat bases or legs are the most stable;</li><li>• the shape of a structure affects its strength;</li><li>• materials can be manipulated to improve strength and stiffness;</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• generate and communicate ideas using sketching and modelling;</li><li>• learn about different types of structures, found in the natural world and in everyday objects;</li><li>• make a structure according to design criteria;</li><li>• create joints and structures from paper/card and tape;</li></ul>



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	<ul style="list-style-type: none"><li>• a structure is something which has been formed or made from parts;</li><li>• a 'stable' structure is one which is firmly fixed and unlikely to change or move;</li><li>• a 'strong' structure is one which does not break easily;</li><li>• a 'stiff' structure or material is one which does not bend easily.</li></ul>	<ul style="list-style-type: none"><li>• build a strong and stiff structure by folding paper;</li><li>• explore the features of structures;</li><li>• compare the stability of different shapes;</li><li>• test the strength of own structures;</li><li>• identify the weakest part of a structure;</li><li>• evaluate the strength, stiffness and stability of own structure.</li></ul>
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Year 3	Knowledge	Skills
<b>Autumn</b> <b>Constructing a Castle (Structures)</b>	Children will know: <ul style="list-style-type: none"><li>• wide and flat based objects are more stable;</li><li>• the importance of strength and stiffness in structures;</li><li>• the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose;</li><li>• a façade is the front of a structure;</li><li>• a castle needed to be strong and stable to withstand enemy attack;</li><li>• a design specification is a list of success criteria for a product.</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• design with key features to appeal to a specific person/purpose;</li><li>• draw and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours;</li><li>• create special features for individual designs;</li><li>• make facades from a range of recycled materials;</li><li>• evaluate own work and the work of others based on the aesthetic of the finished product and in comparison to the original design;</li><li>• suggest points for modification of the individual designs.</li></ul>
<b>Spring</b> <b>Cross Stitch an Applique (Textiles)</b>	Children will know: <ul style="list-style-type: none"><li>• applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces;</li><li>• when two edges of fabric have been joined together it is called a seam;</li><li>• it is important to leave space on the fabric for the seam;</li><li>• some products are turned inside out after sewing so the stitching is hidden.</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• design and make a template from an existing cushion and applying individual design criteria.</li><li>• follow design criteria to create;</li><li>• select and cut fabrics with ease using fabric scissors;</li><li>• thread needles with greater independence;</li><li>• tie knots with greater independence;</li><li>• sew cross stitch to join fabric;</li><li>• decorate fabric using appliqué;</li><li>• complete design ideas with stuffing and sewing the edges;</li><li>• evaluate an end product and thinking of other ways in which to create similar items.</li></ul>
<b>Summer</b> <b>Pneumatic toys Mechanical (Systems)</b>	Children will know: <ul style="list-style-type: none"><li>• how pneumatic systems work;</li><li>• pneumatic systems can be used as part of a mechanism;</li><li>• pneumatic systems operate by drawing in, releasing and compressing air;</li><li>• sketches, drawings and diagrams can be used to communicate design ideas;</li><li>• exploded-diagrams are used to show how different parts of a product fit together;</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• design a toy which uses a pneumatic system;</li><li>• design a design criteria from a design brief;</li><li>• generate ideas using thumbnail sketches and exploded diagrams;</li><li>• create a pneumatic system to create a desired motion;</li><li>• build secure housing for a pneumatic system.</li><li>• use syringes and balloons to create different types of pneumatic systems to make a</li></ul>



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	<ul style="list-style-type: none"><li>• thumbnail sketches are small drawings to get ideas down on paper quickly;</li><li>• different types of drawings are used in design to explain ideas clearly.</li></ul>	<p>functional and appealing pneumatic toy;</p> <ul style="list-style-type: none"><li>• select materials due to their functional and aesthetic characteristics;</li><li>• manipulate materials to create different effects by cutting, creasing, folding and weaving;</li><li>• use the views of others to improve designs;</li><li>• test and modifying the outcome, suggesting improvements;</li><li>• understand the purpose of exploded-diagrams through the eyes of a designer and their client.</li></ul>
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Year 4	Knowledge	Skills
<b>Autumn Slingshot Car Mechanical Systems</b>	Children will know: <ul style="list-style-type: none"><li>• all moving things have kinetic energy;</li><li>• kinetic energy is the energy that something (object/person) has by being in motion;</li><li>• air resistance is the level of drag on an object as it is forced through the air;</li><li>• the shape of a moving object will affect how it moves due to air resistance;</li><li>• products change and evolve over time;</li><li>• aesthetics means how an object or product looks in design and technology;</li><li>• a template is a stencil you can use to help you draw the same shape accurately;</li><li>• a birds-eye view means a view from a high angle;</li><li>• graphics are images which are designed to explain or advertise something;</li><li>• it is important to assess and evaluate design ideas and models against a list of design criteria;</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• design a shape that reduces air resistance;</li><li>• draw a net to create a structure from;</li><li>• choose shapes that increase or decrease speed as a result of air resistance;</li><li>• personalise a design;</li><li>• measure, mark, cut and assemble with increasing accuracy;</li><li>• make a model based on a chosen design;</li><li>• evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance;</li></ul>
<b>Spring Adapting a Recipe Cooking and Nutrition</b>	Children will know: <ul style="list-style-type: none"><li>• the amount of an ingredient in a recipe is known as the 'quantity.';</li><li>• it is important to use oven gloves when removing hot food from an oven;</li><li>• the following cooking techniques: sieving, creaming, rubbing method, cooling;</li><li>• the importance of budgeting while planning ingredients for biscuits;</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• design a biscuit within a given budget, drawing upon previous taste testing judgements;</li><li>• follow a baking recipe, from start to finish, including the preparation of ingredients;</li><li>• cook safely, following basic hygiene rules;</li><li>• adapt a recipe to improve it or change it to meet new criteria;</li><li>• evaluate a recipe, considering: taste, smell, texture and appearance;</li><li>• describe the impact of the budget on the selection of ingredients;</li><li>• evaluate and compare a range of food products;</li><li>• suggest modifications to a recipe.</li></ul>
<b>Summer Pavilions</b>	Children will know: <ul style="list-style-type: none"><li>• what a frame structure is;</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• design a stable pavilion structure that is aesthetically pleasing;</li></ul>



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<b>Structures</b>	<ul style="list-style-type: none"><li>• that a 'free-standing' structure is one that can stand on its own;</li><li>• a pavilion is a decorate building or structure for leisure activities;</li><li>• cladding can be applied to structures for different effects;</li><li>• aesthetics are how a product looks;</li></ul>	<ul style="list-style-type: none"><li>• selecting materials to create a desired effect;</li><li>• build frame structures designed to support weight;</li><li>• create a range of different shaped frame structures;</li><li>• make a variety of free-standing frame structures of different shapes and sizes;</li><li>• select appropriate materials to build a strong structure for the cladding;</li><li>• reinforce corners to strengthen a structure;</li><li>• create a design in accordance with a plan;</li><li>• create different textural effects with materials.</li></ul>
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Year 5	Knowledge	Skills
<b>Doodlers (Electrical Systems)</b>	<p>Children will know:</p> <ul style="list-style-type: none"><li>• series circuits only have one direction for the electricity to flow;</li><li>• when there is a break in a series circuit, all components turn off;</li><li>• an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin;</li><li>• a motorised product is one which uses a motor to function;</li></ul>	<p>Children will be able to:</p> <ul style="list-style-type: none"><li>• identify factors that could be changed on existing products and explain how these would alter the form and function of the product;</li><li>• develop design criteria based on findings from investigating existing products;</li><li>• develop design criteria that clarifies the target user;</li><li>• alter a product's form and function by tinkering with its configuration;</li><li>• make a functional series circuit, incorporating a motor;</li><li>• construct a product with consideration for the design criteria;</li><li>• break down the construction process into steps so that others can make the product;</li><li>• carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses;</li><li>• determine which parts of a product affect its function and which parts affect its form;</li><li>• analyse whether changes in configuration positively or negatively affect an existing product;</li><li>• peer evaluate a set of instructions to build a product.</li></ul>
<b>Spring Pop-up book (Mechanical systems)</b>	<p>Children will know:</p> <ul style="list-style-type: none"><li>• mechanisms control movement;</li><li>• mechanisms can be used to change one kind of motion into another;</li><li>• how to use sliders, pivots and folds;</li><li>• the name for each mechanism, input and output;</li><li>• a design brief is a description of what I am going to design and make;</li><li>• designers often want to hide mechanisms to make a product more aesthetically pleasing.</li></ul>	<p>Children will be able to:</p> <ul style="list-style-type: none"><li>• design a pop-up book which uses a mixture of structures and mechanisms;</li><li>• create a storyboard of ideas for a book;</li><li>• following a design brief to make a pop-up book, neatly and with focus on accuracy;</li><li>• make mechanisms using sliders, pivots and folds to produce movement.</li><li>• use layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result;</li><li>• evaluate the work of others and suggest points for improvement.</li></ul>



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### Summer Waistcoats (Textiles)

Children will know:

- it is important to design clothing with the client/target customer in mind;
- that using a template (or clothing pattern) helps to accurately mark out a design on fabric;
- the importance of consistently sized stitches;
- different decorative stitches;

Children will be able to:

- design a waistcoat in accordance with a specification and design criteria to fit a specific theme;
- annotate designs;
- use a template when pinning panels onto fabric;
- mark and cut fabric accurately, in accordance with a design;
- sew a strong running stitch;
- tie strong knots;
- decorate a waistcoat – attaching objects using thread and adding a secure fastening;
- evaluate work continually as it is created.



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Year 6	Knowledge	Skills
<b>Autumn Castles (Structures)</b>	Children will know: <ul style="list-style-type: none"><li>• structures can be strengthened by manipulating materials and shapes;</li><li>• what a 'footprint plan' is;</li><li>• in the real world, design, can impact users in positive and negative ways;</li><li>• a prototype is a cheap model to test a design idea.</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• design featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs;</li><li>• use a range of materials to reinforce and add decoration to structures;</li><li>• improve a design plan based on peer evaluation;</li><li>• test and adapt a design to improve it as it is developed;</li><li>• identify what makes a successful structure.</li></ul>
<b>Spring Steady Hand Game (Electrical Systems)</b>	Children will know: <ul style="list-style-type: none"><li>• the purpose of products;</li><li>• what is meant by 'fit for purpose' and 'form over function';</li><li>• the importance of 'form follows function';</li><li>• diagram perspectives 'top view', 'side view' and 'back'.</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• design a steady hand game, identifying and naming the components required;</li><li>• draw a design from three different perspectives;</li><li>• generate ideas through sketching and discussion;</li><li>• model ideas through prototypes;</li><li>• construct a stable base for a game;</li><li>• accurately cut, fold and assemble a net;</li><li>• make and test a circuit;</li><li>• incorporate a circuit into a base;</li><li>• test their own and others' finished games, identifying what went well and making suggestions for improvement;</li></ul>
<b>Summer Come Dine with Me (Cooking and Nutrition)</b>	Children will know: <ul style="list-style-type: none"><li>• 'flavour' is how a food or drink tastes;</li><li>• many countries have 'national dishes' which are recipes associated with that country;</li><li>• 'processed food' means food that has been put through multiple changes in a factory;</li><li>• it is important to wash fruit and vegetables before eating to remove any dirt and insecticides;</li><li>• what happens to a certain food before it appears on the supermarket shelf.</li></ul>	Children will be able to: <ul style="list-style-type: none"><li>• write a recipe, explaining the key steps, method and ingredients;</li><li>• create facts and drawings from research;</li><li>• follow a recipe, including using the correct quantities of each ingredient;</li><li>• adapt a recipe based on research;</li><li>• work to a given timescale;</li><li>• work safely and hygienically;</li><li>• evaluate a recipe based on key criteria;</li><li>• suggest points of improvements in productions.</li></ul>



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