

# Beam County Primary School: Progression Map

## Subject: Design Technology



### Key Concepts

**Design**

**Make**

**Evaluate**

**Technical Knowledge**

EYFS	End Points EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	End Points KS2
<p><b>Disciplinary</b> Giving a verbal evaluation of their own and others' junk models with adult support.</p> <p>Checking to see if their model matches their plan.</p> <p>Considering what they would do differently if they were to do it again.</p> <p>Describing their favourite and least favourite part of their model.</p> <p>Making predictions about, and evaluating different materials to see if they are waterproof.</p> <p>Making predictions about, and evaluating existing boats to see which floats best.</p> <p>Testing their design and reflecting on what could have been done differently.</p> <p>Investigating the how the shapes and structure of a boat</p>	<p><b>1. Discuss with others what went well or not so well and why that might have been.</b></p>	<p><b>Disciplinary</b> Suggesting information to be included on packaging.</p> <p>Reflecting on a finished product, explaining likes and dislikes.</p>	<p><b>Disciplinary</b> Testing the strength of own structure.</p> <p>Identifying the weakest part of a structure.</p> <p>Evaluating the strength, stiffness and stability of own structure.</p> <p>Evaluating different designs.</p> <p>Testing and adapting a design.</p> <p>Evaluating own designs against design criteria.</p> <p>Using peer feedback to modify a final design.</p> <p><b>Knowledge</b> 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>	<p><b>Disciplinary</b> Establishing and using design criteria to help test and review dishes.</p> <p>Describing the benefits of seasonal fruits and vegetables and the impact on the environment.</p> <p>Suggesting points for improvement when making a seasonal tart.</p> <p>Evaluating an end product and thinking of other ways in which to create similar items.</p>	<p><b>Disciplinary</b> Evaluating structures made by the class.</p> <p>Describing what characteristics of a design and construction made it the most effective.</p> <p>Considering effective and ineffective designs.</p> <p>Using the views of others to improve designs.</p> <p>Testing and modifying the outcome, suggesting improvements.</p> <p>Understanding the purpose of exploded-diagrams through the eyes of a designer and their client.</p> <p>Evaluating electrical products.</p> <p>Testing and evaluating the success of a final product.</p>	<p><b>Disciplinary</b> Identifying the nutritional differences between different products and recipes.</p> <p>Identifying and describing healthy benefits of food groups.</p> <p>Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses.</p> <ul style="list-style-type: none"> <li>• Determining which parts of a product affect its function and which parts affect its form.</li> <li>• Analysing whether changes in configuration positively or negatively affect an existing product.</li> </ul> <p><b>Knowledge</b> To know that product analysis is critiquing the strengths and weaknesses of a product.</p>	<p><b>Disciplinary</b> Improving a design plan based on peer evaluation.</p> <p>Testing and adapting a design to improve it as it is developed.</p> <p>Identifying what makes a successful structure.</p> <p>Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool.</p> <p>Developing an awareness of sustainable design.</p> <p>Identifying key industries that utilise 3D CAD modelling and explaining why.</p> <p>Describing how the product concept fits the client's request and how it will benefit the customers.</p> <p>Explaining the key functions in my program, including any additions.</p>	<p><b>1. Evaluate ideas and products against design criteria and existing products through clear communication using technical language and considering the views of others to help improve a project.</b></p>

<p>affect the way it moves.</p> <p>Reflecting on a finished product and comparing to their design.</p> <p>Tasting the soup and giving opinions.</p> <p>Describing some of the following when tasting food: look, feel, smell and taste.</p> <p>Choosing their favourite packaging design and explaining why.</p>							<p>Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool.</p> <p>Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch.</p> <p>Demonstrating a functional program as part of a product concept pitch.</p> <p>Reflecting on their work continually throughout the design, make and evaluate process.</p>
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**NC Alignment**

**Early Learning Areas**

C&L: By commenting on what children are interested in or doing, and echoing back what they say with new vocabulary added, practitioners will build children's language effectively.

EA&D: The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts.

**KS1**

Explore and evaluate a range of existing products

Evaluate their ideas and products against design criteria

**KS2**

Investigate and analyse a range of existing products

Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

<p><b>Disciplinary</b> Making verbal plans and material choices.</p> <p>Developing a junk model.</p> <p>Designing a junk model boat.</p> <p>Using knowledge from exploration to inform design.</p> <p>Discussing what a good design needs.</p> <p>Designing a simple pattern with paper.</p>	<p><b>2.Begin to use the language of designing whilst setting and working towards simple goals.</b></p>	<p><b>Disciplinary</b> Learning the importance of a clear design criteria.</p> <p>Including individual preferences and requirements in a design.</p> <p>Designing smoothie carton packaging by-hand or on ICT software.</p> <p>Using a template to create a design for a puppet.</p> <p><b>Knowledge</b></p>	<p><b>Disciplinary</b> Generating and communicating ideas using sketching and modelling.</p> <p>Making a structure according to design criteria.</p> <p>Selecting a suitable linkage system to produce the desired motion.</p> <p>Designing a wheel.</p>	<p><b>Disciplinary</b> Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.</p> <p>Designing and making a template from an existing cushion and applying individual design criteria.</p>	<p><b>Disciplinary</b> Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect.</p> <p>Creating a design in accordance with a plan.</p> <p>Designing a toy which uses a pneumatic system.</p> <p>Developing design criteria from a design brief.</p>	<p><b>Disciplinary</b> Designing a pop-up book which uses a mixture of structures and mechanisms.</p> <p>Storyboarding ideas for a book.</p> <p>Following a design brief to make a pop up book, neatly and with focus on accuracy.</p> <p>Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if</p>	<p><b>Disciplinary</b> 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> <p>Writing a design brief from information submitted by a client.</p>	<p><b>2.Develop precise design criteria through sketches, detailed illustrations, prototypes and by reflecting on how key historical events and individuals have helped to shape the world through ideas, concepts or physical products.</b></p>
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<p>Designing a bookmark.</p> <p>Designing a soup recipe as a class.</p> <p>Designing soup packaging.</p> <p><b>Knowledge</b> To know that some objects float and others sink.</p> <p>To know the different parts of a boat.</p> <p>To know that a design is a way of planning our idea before we start.</p> <p>To discuss why different packages might be used for different foods.</p>		<p>To know that design criteria is a list of points to ensure the product meets the clients needs and wants.</p> <p>To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity.</p> <p>To know that windmill turbines use wind to turn and make the machines inside work.</p> <p>To know that a windmill is a structure with sails that are moved by the wind.</p> <p>To know the three main parts of a windmill are the turbine, axle and structure.</p> <p>To know that windmills are used to generate power and were used for grinding flour.</p> <p>To know that drawing a design idea is useful to see how an idea will look.</p>	<p>Following a design brief.</p> <p>Creating a class design criteria for a moving monster.</p> <p>Designing a moving monster for a specific audience in accordance with a design criteria.</p> <p><b>Knowledge</b> To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.</p> <p>To know that a 'strong' structure is one which does not break easily.</p> <p>To know that a 'stiff' structure or material is one which does not bend easily.</p> <p>To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.</p> <p>To know some real-life objects that contain mechanisms</p>	<p>Following design criteria to create an Egyptian collar.</p> <p>Embellishing the collars based on design ideas.</p> <p>Problem solving by suggesting which features on a micro:bit might be useful and justifying my ideas.</p> <p>Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge.</p> <p>Developing design ideas through annotated sketches to create a product concept.</p> <p>Developing design criteria to respond to a design brief.</p> <p>Following a list of design requirements.</p>	<p>Generating ideas using thumbnail sketches and exploded diagrams.</p> <p>Learning that different types of drawings are used in design to explain ideas clearly.</p> <p>Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.</p> <p><b>Knowledge</b> To understand what a frame structure is.</p> <p>To know that a 'free-standing' structure is one which can stand on its own.</p> <p>To know that aesthetics are how a product looks.</p> <p>To know that a product's function means its purpose.</p> <p>To understand that the target audience means the person or group of people a product is designed for.</p> <p>To know that architects consider light, shadow and patterns when designing.</p> <p>To understand how sketches, drawings and diagrams can be used to communicate design ideas.</p> <p>To know that exploded-diagrams are used to</p>	<p>you remove, substitute or add additional ingredients.</p> <p>Writing an amended method for a recipe to incorporate the relevant changes to ingredients.</p> <p>Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product.</p> <p>Developing design criteria based on findings from investigating existing products.</p> <p>Developing design criteria that clarifies the target user.</p> <p>Constructing a product with consideration for the design criteria.</p> <p><b>Knowledge</b> To know that a design brief is a description of what I am going to design and make.</p> <p>To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.</p>	<p>Developing design criteria to fulfil the client's request.</p> <p>Considering and suggesting additional functions for my navigation tool.</p> <p>Developing a product idea through annotated sketches.</p> <p>Designing a waistcoat in accordance to a specification linked to set of design criteria.</p> <p>Annotating designs, to explain their decisions.</p> <p><b>Knowledge</b> To understand what a 'footprint plan' is.</p> <p>To understand that in the real world, design can impact users in positive and negative ways.</p> <p>To know that a prototype is a cheap model to test a design idea.</p> <p>To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request.</p> <p>To know that 'multifunctional' means an object or product has more than one function.</p>	
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					<p>show how different parts of a product fit together.</p> <p>To know that thumbnail sketches are small drawings to get ideas down on paper quickly.</p> <p>To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison.</p>		<p>To understand that it is important to design clothing with the client/ target customer in mind.</p>
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**NC Alignment**  
**Early Learning Areas**  
 C&L: By commenting on what children are interested in or doing, and echoing back what they say with new vocabulary added, practitioners will build children's language effectively.  
 EA&D: It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials.  
**KS1**  
 Design purposeful, functional, appealing products for themselves and other users based on design criteria  
 Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology  
**KS2**  
 Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups  
 Understand how key events and individuals in design and technology have helped shape the world  
 Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

<p><b>Disciplinary</b> Chopping plasticine safely.</p> <p>Chopping vegetables with support.</p> <p><b>Knowledge</b> To know that soup is ingredients (usually vegetables and liquid) blended together.</p> <p>To know that vegetables are grown.</p> <p>To recognise and name some common vegetables.</p> <p>To know that different vegetables taste different.</p> <p>To know that eating vegetables is good for us.</p>	<p><b>3.Know that food can be grown and begin to understand some tools, techniques and processes involved in food preparation.</b></p>	<p><b>Disciplinary</b> Identifying if a food is a fruit or a vegetable.</p> <p>Learning where and how fruits and vegetables grow.</p> <p><b>Knowledge</b> To know that a blender is a machine which mixes ingredients together into a smooth liquid.</p> <p>To know that a fruit has seeds.</p> <p>To know that fruits grow on trees or vines.</p> <p>To know that vegetables can grow either above or below ground.</p>		<p><b>Disciplinary</b> Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.</p> <p>Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination.</p> <p>Following the instructions within a recipe.</p> <p><b>Knowledge</b> To know that vegetables and fruit grow in certain seasons.</p>		<p><b>Disciplinary</b> Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.</p> <p>Cutting and preparing vegetables safely.</p> <p>Using equipment safely, including knives, hot pans and hobs.</p> <p>Knowing how to avoid cross-contamination.</p> <p>Following a step by step method carefully to make a recipe.</p>	<p><b>3.Apply the principles of a healthy and varied diet through preparing and cooking a variety of nutritional and seasonal dishes from ingredients that have been grown, reared, caught and processed.</b></p>
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		<ul style="list-style-type: none"> <li>To know that vegetables is any edible part of a plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).</li> </ul>		<ul style="list-style-type: none"> <li>To know that cooking instructions are known as a 'recipe'.</li> <li>To know that imported food is food which has been brought into the country.</li> <li>To know that exported food is food which has been sent to another country.</li> <li>To know that eating seasonal foods can have a positive impact on the environment.</li> <li>To know that similar coloured fruits and vegetables often have similar nutritional benefits.</li> <li>To know that the appearance of food is as important as taste.</li> </ul>		<p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>To know that recipes can be adapted to suit nutritional needs and dietary requirements.</li> <li>To know that I can use a nutritional calculator to see how healthy a food option is.</li> <li>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.</li> <li>To know that coloured chopping boards can prevent cross-contamination.</li> <li>To know that nutritional information is found on food packaging.</li> </ul>	
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**NC Alignment**

**Early Learning Areas**

UTW: The frequency and range of children's personal experiences increases their knowledge and sense of the world around them

EA&D: It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials.

**KS1**

Use the basic principles of a healthy and varied diet to prepare dishes

Understand where food comes from

**KS2**

Understand and apply the principles of a healthy and varied diet

Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques

Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed

<p><b>Disciplinary</b> Improving fine motor/scissor skills with a variety of materials.</p> <p>Joining materials in a variety of ways (temporary and permanent).</p>	<p><b>4.Safely use and explore a variety of materials, tools and techniques, experimenting with form and function.</b></p>	<p><b>Disciplinary</b> Making stable structures from card.</p> <p>Following instructions to cut and assemble the supporting structure of a windmill.</p>	<p><b>Disciplinary</b> Creating joints and structures from paper/card and tape.</p> <p>Building a strong and stiff structure by folding paper.</p>	<p><b>Disciplinary</b> Selecting and cutting fabrics with ease using fabric scissors.</p> <p>Threading needles with greater independence.</p>	<p><b>Disciplinary</b> Making a variety of free standing frame structures of different shapes and sizes.</p> <p>Selecting appropriate materials to build a strong structure and cladding.</p>	<p><b>Disciplinary</b> Making mechanisms and/or structures using sliders, pivots and folds to produce movement.</p> <p>Using layers and spacers to hide the workings of</p>	<p><b>Disciplinary</b> Measuring, marking and cutting wood to create a range of structures.</p> <p>Using a range of materials to reinforce and add</p>	<p><b>4.Select and use a wide variety of appropriate tools, materials and equipment to perform specific tasks accurately, safely and appropriately to</b></p>
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<p>Joining different materials together.</p> <p>Making a boat that floats and is waterproof, considering material choices.</p> <p>Choosing from available materials</p> <p>Developing fine motor/cutting skills with scissors.</p> <p>Exploring fine motor/threading and weaving (under, over technique) with a variety of materials.</p> <p>Using a prepared needle and wool to practise threading.</p> <p>Chopping plasticine safely.</p> <p>Chopping vegetables with support.</p> <p><b>Knowledge</b> To know there are a range to different materials that can be used to make a model and that they are all slightly different.</p> <p>To know that 'waterproof' materials are those which do not absorb water.</p> <p>To know that threading is putting one material through an object.</p>		<p>Finding the middle of an object.</p> <p>Puncturing holes.</p> <p>Cutting evenly and carefully.</p> <p>Chopping fruit and vegetables safely to make a smoothie.</p> <p>Cutting fabric neatly with scissors.</p> <p>Using joining methods to decorate a puppet.</p> <p>Sequencing steps for construction.</p> <p><b>Knowledge</b> To know that there are various temporary methods of joining fabric by using staples, glue or pins.</p> <p>To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.</p> <p>To know that 'joining technique' means connecting two pieces of material together.</p> <p>To understand that different techniques for joining materials can be used for different purposes.</p>	<p>Selecting materials according to their characteristics.</p> <p>Making linkages using card for levers and split pins for pivots.</p> <p>Experimenting with linkages adjusting the widths, lengths and thicknesses of card used.</p> <p>Cutting and assembling components neatly.</p> <p><b>Knowledge</b> To know that materials can be manipulated to improve strength and stiffness.</p> <p>To know that different materials have different properties and are therefore suitable for different uses.</p>	<p>Tying knots with greater independence.</p> <p>Sewing cross stitch to join fabric.</p> <p>Decorating fabric using appliqué</p> <p><b>Knowledge</b> To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces.</p> <p>To know that when two edges of fabric have been joined together it is called a seam.</p> <p>To know that it is important to leave space on the fabric for the seam.</p> <p>To understand that some products are turned inside out after sewing so the stitching is hidden.</p>	<p>Learning to create different textural effects with materials.</p> <p>Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy.</p> <p>Selecting materials due to their functional and aesthetic characteristics.</p> <p>Manipulating materials to create different effects by cutting, creasing, folding and weaving.</p>	<p>mechanical parts for an aesthetically pleasing result.</p> <p>Cutting and preparing vegetables safely.</p> <p>Using equipment safely, including knives, hot pans and hobs.</p> <p><b>Knowledge</b> To know that 'configuration' means how the parts of a product are arranged.</p>	<p>decoration to structures.</p> <p>Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo).</p> <p>Explaining material choices and why they were chosen as part of a product concept.</p> <p>Using a template when cutting fabric to ensure they achieve the correct shape.</p> <p>Using pins effectively to secure a template to fabric without creases or bulges.</p> <p>Marking and cutting fabric accurately, in accordance with their design.</p> <p>Sewing a strong running stitch, making small, neat stitches and following the edge.</p> <p>Tying strong knots.</p> <p>Decorating a waistcoat, attaching features (such as appliqué) using thread.</p> <p>Finishing the waistcoat with a secure fastening (such as buttons).</p>	<p><b>the product or material function.</b></p>
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							<p>Learning different decorative stitches.</p> <p>Sewing accurately with evenly spaced, neat stitches.</p> <p><b>Knowledge</b> To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.</p> <p>To understand the importance of consistently sized stitches.</p>	
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**NC Alignment**  
**Early Learning Areas**  
 PD: Gross and fine motor experiences develop incrementally throughout early childhood, starting with sensory explorations and the development of a child’s strength, co-ordination and positional awareness  
 Fine motor control and precision helps with hand-eye co-ordination  
 EA&D: It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials.  
**KS1**  
 Select from and use a range of tools and equipment to perform practical tasks  
 Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics  
**KS2**  
 Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately  
 Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

<p>Describing their junk model, and how they intend to put it together.</p> <p><b>Knowledge</b> Making simple suggestions to fix their junk model.</p>	<p><b>5.Explore materials whilst junk modelling or making a product, showing a freedom of experimenting.</b></p>	<p>Creating supporting structures.</p> <p>Making functioning turbines and axles which are assembled into a main supporting structure.</p> <p>Adding weight to structures.</p> <p><b>Knowledge</b> To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).</p>	<p>Creating joints and structures from paper/card and tape.</p> <p>Building a strong and stiff structure by folding paper.</p> <p><b>Knowledge</b> To know that materials can be manipulated to improve strength and stiffness.</p> <p>To know that a structure is something which has been formed or made from parts.</p>		<p>Building frame structures designed to support weight.</p> <p>Creating a range of different shaped frame structures.</p> <p>Selecting appropriate materials to build a strong structure and cladding.</p> <p>Reinforcing corners to strengthen a structure.</p> <p>Creating a pneumatic system to create a desired motion.</p> <p>Building secure housing for a pneumatic system.</p>	<p>Naming each mechanism, input and output accurately.</p> <p>Making mechanisms and/or structures using sliders, pivots and folds to produce movement.</p> <p>Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.</p> <p><b>Knowledge</b> To know that mechanisms control movement.</p>	<p>Building a range of play apparatus structures drawing upon new and prior knowledge of structures.</p> <p><b>Knowledge</b> To know that structures can be strengthened by manipulating materials and shapes.</p>	<p><b>5.Apply a clear understanding of how to strengthen, stiffen or reinforce complex structures and apply mechanical systems and kinetic forces in their products.</b></p>
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		<p>To understand that axles are used in structures and mechanisms to make parts turn in a circle.</p> <p>To begin to understand that different structures are used for different purposes.</p> <p>To know that a structure is something that has been made and put together.</p> <p>To know that the sails or blades of a windmill are moved by the wind.</p> <p>To know that a structure is something built for a reason.</p> <p>To know that stable structures do not topple.</p> <p>To know that adding weight to the base of a structure can make it more stable.</p>	<p>To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.</p> <p>To know that a 'strong' structure is one which does not break easily.</p> <p>To know that a 'stiff' structure or material is one which does not bend easily.</p> <p>To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.</p> <p>To know that there is always an input and output in a mechanism.</p> <p>To know that an input is the energy that is used to start something working.</p> <p>To know that an output is the movement that happens as a result of the input.</p> <p>To know that a lever is something that turns on a pivot.</p> <p>To know that a linkage mechanism is made up of a series of levers.</p>		<p>Using appropriate equipment to cut and attach materials.</p> <p><b>Knowledge</b></p> <p>To understand what a frame structure is.</p> <p>To know that a 'free-standing' structure is one which can stand on its own.</p> <p>To know that a pavilion is a decorative building or structure for leisure activities.</p> <p>To know that cladding can be applied to structures for different effects.</p> <p>To understand how pneumatic systems work.</p> <p>To understand that pneumatic systems can be used as part of a mechanism.</p> <p>To know that pneumatic systems operate by drawing in, releasing and compressing air.</p>	<p>To understand that mechanisms can be used to change one kind of motion into another.</p> <p>To understand how to use sliders, pivots and folds to create paper-based mechanisms.</p>		
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**NC Alignment**

**Early Learning Areas**

C&L: By commenting on what children are interested in or doing, and echoing back what they say with new vocabulary added, practitioners will build children's language effectively.

PD: Gross and fine motor experiences develop incrementally throughout early childhood, starting with sensory explorations and the development of a child's strength, co-ordination and positional awareness



EA&D: It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials.

Mathematics: Develop their spatial reasoning skills

**KS1**

Build structures, exploring how they can be made stronger, stiffer and more stable

Explore and use mechanisms [for example, levers, sliders, wheels and axles] in their products

**KS2**

Apply their understanding of how to strengthen, stiffen and reinforce more complex structures

Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]

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.

**Knowledge**

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.

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.

Altering a product's form and function by tinkering with its configuration.

Making a functional series circuit, incorporating a motor.

**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.

**6. Understand clearly how electrical systems operate and how different electrical components can be applied to make changes.**

**NC Alignment**

**KS2**

Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]

Problem solving by suggesting which features on a micro:bit might be useful

Placing and manoeuvring 3D objects, using CAD.

**7. Understand and apply computer coding to program, control and**

and justifying my ideas.

Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge.

Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm.

**Knowledge**

To understand that, in programming, a 'loop' is code that repeats something again and again until stopped.

To know that a micro:bit is a pocket-sized, codeable computer.

To know that a simulator is able to replicate the functions of an existing piece of technology.

To understand what is meant by 'point of sale display.'

To know that CAD stands for 'Computer-aided design'.

Changing the properties of, or combining one or more 3D objects, using CAD.

Considering and suggesting additional functions for my navigation tool.

Programming an N,E, S, W cardinal compass.

**Knowledge**

To know that accelerometers can detect movement.

To understand that sensors can be useful in products as they mean the product can function without human input.

To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.

**monitor their products.**

**NC Alignment**

**KS2**

Apply their understanding of computing to program, monitor and control their products

