



Design and Technology Progression of Skills and knowledge

Purpose of study

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

Structures				
EYFS (Reception)				
Kapow Sonar ELG National Curriculum	Junk Modelling	Boats	End of Key Stage Expectations	
Skills	Design	<p>Make verbal plans and material choices. Develop a junk model.</p> <p>Use what they have learned about media and materials in original ways, thinking about uses and purpose.</p> <p>Represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role-play and stories.</p>	<p>Design a junk model boat.</p> <p>Use knowledge from exploration to inform design.</p> <p>Use what they have learned about media and materials in original ways, thinking about uses and purpose.</p> <p>Represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role-play and stories.</p>	
	Make	<p>Improve fine motor/scissor skills with a variety of materials.</p> <p>Join materials in a variety of ways (temporary and permanent).</p> <p>Join different materials together.</p> <p>Describe their junk model, and how they intend to put it together.</p> <p>Safely use and explore a variety of materials, tools and techniques.</p> <p>Experiment with colour, design, texture, form and function.</p> <p>Use what they have learned about media and materials in original ways, thinking about uses and purposes.</p> <p>Represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role-play and stories.</p>	<p>Make a boat that floats and is waterproof, considering material choices.</p> <p>Safely use and explore a variety of materials, tools and techniques.</p> <p>Experiment with colour, design, texture, form and function.</p> <p>Use what they have learned about media and materials in original ways, thinking about uses and purposes.</p> <p>Represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role-play and stories.</p>	<p>ELG: EAD (Creating with Materials):</p> <p>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function;</p>
	Evaluate	<p>Give a verbal evaluation of their own and others' junk models with adult support. Check to see if their model matches their plan.</p>	<p>Make predictions about, and evaluating different materials to see if they are waterproof.</p>	<p>ELG: EAD (Creating with Materials):</p>

		Consider what they would do differently if they were to do it again. Describe their favourite and least favourite part of their model.	Make predictions about, and evaluating existing boats to see which floats best. Test their design and reflecting on what could have been done differently. Investigate the how the shapes and structure of a boat affect the way it moves.	Share their creations, explaining the process they have used
Knowledge	Technical	Know there are a range to different materials that can be used to make a model and that they are all slightly different. Make simple suggestions to fix their junk model. <i>Use what they have learned about media and materials in original ways, thinking about uses and purposes.</i>	Know that 'waterproof' materials are those which do not absorb water. <i>Use what they have learned about media and materials in original ways, thinking about uses and purposes</i>	
	Additional		Know that some objects float and others sink. Know the different parts of a boat.	

Structures				
		Year One 'Constructing a windmill'	Year Two 'Baby Bear's chair'	End of Key Stage Expectations
Skills	Design	Learn the importance of a clear design criteria. Include individual preferences and requirements in a design. <i>Design simple products that work and look appealing.</i> <i>Discuss and draw ideas and use ICT to communicate.</i>	Generate and communicate ideas using sketching and modelling. Learn about different types of structures, found in the natural world and in everyday objects. <i>Design products for others and themselves that are purposeful, functional and appealing.</i> <i>Generate, develop, model and communicate ideas through talking, drawing, templates and ICT.</i>	<i>Design purposeful, functional, appealing products for themselves and other users based on design criteria</i> <i>Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</i>
	Make	Make stable structures from card, tape and glue. Learn how to turn 2D nets into 3D structures.	Make a structure according to a design criteria. Create joints and structures from paper/card and tape.	<i>Select from and use a range of tools and equipment to perform practical tasks (for</i>

		<p>Follow instructions to cut and assemble the supporting structure of a windmill. Make functioning turbines and axles which are assembled into a main supporting structure. <i>Use a range of materials and components eg construction, textiles and ingredients.</i> <i>Use a range of tools and equipment to perform practical tasks eg cut, shape, join and finish.</i></p>	<p>Build a strong and stiff structure by folding paper. <i>Select from and use a wide range of materials and components (according to their characteristics) eg construction, textiles and ingredients.</i> <i>Select from and use a wide range of tools and equipment to perform practical tasks eg cut, shape, join and finish.</i></p>	<p>example, cutting, shaping, joining and finishing)</p> <p>Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</p>
	Evaluate	<p>Evaluate a windmill according to the design criteria, testing whether the structure is strong and stable and altering if it isn't. Suggest points for improvements. <i>Explore existing products eg home, school.</i> <i>Discuss own ideas and designs.</i></p>	<p>Explore the features of structures. Compare the stability of different shapes. Test the strength of own structures. Identify the weakest part of a structure. Evaluate the strength, stiffness and stability of own structure. <i>Explore and evaluate a range of existing products eg home, school.</i> <i>Evaluate own ideas and designs against given design criteria.</i></p>	<p>Explore and evaluate a range of existing products</p> <p>Evaluate their ideas and products against design criteria</p>
Knowledge	Technical	<p>Understand that the shape of materials can be changed to improve the strength and stiffness of structures. Understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). Understand that axles are used in structures and mechanisms to make parts turn in a circle. Begin to understand that different structures are used for different purposes. Know that a structure is something that has been made and put together. <i>Start to build structures, exploring ways to stiffen, stable and strengthen.</i> <i>Explore simple mechanisms.</i></p>	<p>Know that shapes and structures with wide, flat bases or legs are the most stable. Understand that the shape of a structure affects its strength. Know that materials can be manipulated to improve strength and stiffness. Know that a structure is something which has been formed or made from parts. Know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. Know that a 'strong' structure is one which does not break easily. Know that a 'stiff' structure or material is one which does not bend easily.</p>	<p>Build structures, exploring how they can be made stronger, stiffer and more stable</p> <p>Explore and use mechanisms (for example, levers, sliders, wheels and axles), in their products</p>

			<p>Build structures, exploring ways to stiffen, stabilise and strengthen.</p> <p>Explore and use mechanisms eg levers, wheels and axles.</p>	
	Additional	<p>Know that a client is the person I am designing for.</p> <p>Know that a design criteria is a list of points to ensure the product meets the clients needs and wants.</p> <p>Know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity.</p> <p>Know that windmill turbines use wind to turn and make the machines inside work. Know that a windmill is a structure with sails that are moved by the wind.</p> <p>Know the three main parts of a windmill are the turbine, axle and structure.</p>	<p>Know that natural structures are those found in nature.</p> <p>Know that man-made structures are those made by people</p>	

Structures				
		Year Three 'Constructing a castle'	Year Four 'Pavilions'	End of Key Stage Expectations
Skills	Design	<p>Design a castle with key features to appeal to a specific person/purpose. Draw and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours. Design and/or decorating a castle tower on CAD software. <i>Communicate ideas using different strategies eg discussion, sketch.</i> <i>Use research to inform design.</i> <i>Take risks to become innovative and resourceful.</i></p>	<p>Design a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. Build frame structures designed to support weight. <i>Communicate, generate and develop ideas using a range of strategies eg prototypes, pattern pieces.</i> <i>Use research to inform design and develop design criteria.</i> <i>Take risks to become innovative and resourceful.</i></p>	<p>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</p> <p>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p>
	Make	<p>Construct a range of 3D geometric shapes using nets. Create special features for individual designs. Make facades from a range of recycled materials. <i>Select from and use a wider range of tools, equipment, materials and components accurately.</i></p>	<p>Create a range of different shaped frame structures. Make a variety of free standing frame structures of different shapes and sizes. Select appropriate materials to build a strong structure and cladding. Reinforce corners to strengthen a structure. Create a design in accordance with a plan. Learn to create different textural effects with materials. <i>Select from and use a wider range of tools, equipment, materials and components accurately to make prototypes.</i></p>	<p>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p> <p>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>
	Evaluate	<p>Evaluate own work and the work of others based on the aesthetic of the finished product</p>	<p>Evaluate structures made by the class.</p>	<p>Investigate and analyse a range of existing products</p>

		<p>and in comparison to the original design. Suggest points for modification of the individual designs.</p> <p>Evaluate own ideas and designs against given design criteria and consider the views of others to improve their work.</p> <p>Investigate a range of existing products that address real / relevant problems, in a range of relevant contexts eg home, leisure, school.</p>	<p>Describe what characteristics of a design and construction made it the most effective. Consider effective and ineffective designs.</p> <p>Evaluate own ideas and designs against given design criteria and consider the views of others to improve their work.</p> <p>Investigate a range of existing products in a range of relevant contexts eg culture, industry.</p>	<p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p> <p>Understand how key events and individuals in design and technology have helped shape the world</p>
Knowledge	Technical	<p>Understand that wide and flat based objects are more stable.</p> <p>Understand the importance of strength and stiffness in structures.</p> <p>Apply understanding of how to strengthen, stiffen and reinforce structures.</p> <p>Identify range of mechanical systems and how they work (gears, pulleys, cams, levers and linkages).</p>	<p>Understand what a frame structure is. Know that a 'free-standing' structure is one which can stand on its own.</p> <p>Apply understanding of how to strengthen, stiffen in order to reinforce more complex structures.</p> <p>Use computing to program, monitor and control products.</p> <p>Identify wider range of mechanical systems and how they work (gears, pulleys, cams, levers and linkages).</p> <p>Use understanding of electrical systems (series circuits, switches, bulbs and motors).</p>	<p>Apply their understanding of how to strengthen, stiffen and reinforce more complex structures</p> <p>Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)</p> <p>Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors)</p> <p>Apply their understanding of computing to program, monitor and control their products.</p>
	Additional	<p>Know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their</p>	<p>Know that a pavilion is a decorative building or structure for leisure activities.</p>	

		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.	Know that cladding can be applied to structures for different effects. Know that aesthetics are how a product looks. Know that a product's function means its purpose. Understand that the target audience means the person or group of people a product is designed for. Know that architects consider light, shadow and patterns when designing.	
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Structures				
		Year Five 'Bridges'	Year Six 'Playgrounds'	End of Key Stage Expectations
Skills	Design	Design a stable structure that is able to support weight. Create a frame structure with a focus on triangulation. <i>Communicate, generate, develop and model ideas using a range of strategies eg computer-aided-design, cross-sectional and exploded diagrams.</i> <i>Use research to inform design and generate own design criteria.</i> <i>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing.</i> <i>Confidently take calculated risks to become innovative, resourceful and enterprising.</i>	Design a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs. <i>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing.</i> <i>Use research to inform innovative design and generate own design criteria.</i> <i>Confidently take calculated risks to become innovative, resourceful and enterprising.</i>	<i>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</i> <i>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</i>
	Make	Make a range of different shaped beam bridges. Use triangles to create truss bridges that span a given distance and support a load.	Build a range of play apparatus structures drawing upon new and prior knowledge of structures.	<i>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping,</i>

		<p>Build a wooden bridge structure. Independently measure and mark wood accurately. Select appropriate tools and equipment for particular tasks. Use the correct techniques to saws safely. Identify where a structure needs reinforcement and using card corners for support. Explain why selecting appropriating materials is an important part of the design process. Understand basic wood functional properties. <i>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes.</i></p>	<p>Measure, mark and cut wood to create a range of structures. Use a range of materials to reinforce and add decoration to structures. <i>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes.</i></p>	<p>joining and finishing], accurately</p> <p>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>
	Evaluate	<p>Adapt and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. Suggest points for improvements for own bridges and those designed by others. <i>Generate own design criteria and evaluate ideas and products against these. Investigate and analyse a range of existing products that address real / relevant problems, in a range of relevant contexts. Understand how key events and individuals in D&T helped to shape the world.</i></p>	<p>Improve a design plan based on peer evaluation. Test and adapt a design to improve it as it is developed. Identify what makes a successful structure. <i>Generate own design criteria and critique ideas and products against these. Explain and understand how key events and individuals in D&T helped to shape the world.</i></p>	<p>Investigate and analyse a range of existing products</p> <p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p> <p>Understand how key events and individuals in design and technology have helped shape the world</p>
Knowledge	Technical	<p>Improve a design plan based on peer evaluation. Test and adapting a design to improve it as it is developed. Identify what makes a successful structure.</p>	<p>Know that structures can be strengthened by manipulating materials and shapes.</p>	<p>Apply their understanding of how to strengthen, stiffen and reinforce more complex structures</p>

		<p>Construct more complex structures by applying range of strategies in order to solve real / relevant problems.</p> <p>Drawing on disciplines & making connections to wider subject areas, apply understanding of computing to program, monitor and control products.</p> <p>Making connections to real & relevant problems, apply understanding of wider range of mechanical systems (gears, pulleys, cams, levers and linkages).</p> <p>Making connections to real & relevant problems, apply understanding of electrical systems (series circuits, switches, bulbs and motors).</p>		<p>Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)</p> <p>Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors)</p> <p>Apply their understanding of computing to program, monitor and control their products.</p>
	Additional	<p>Understand the difference between arch, beam, truss and suspension bridges.</p> <p>To understand how to carry and use a saw safely.</p>	<p>Understand what a 'footprint plan' is.</p> <p>Understand that in the real world, design can impact users in positive and negative ways.</p> <p>Know that a prototype is a cheap model to test a design idea.</p>	

Mechanisms/ Mechanical systems						
		Year One		Year Two		End of Key Stage Expectations
		'Wheels and axles'	'Making a moving storybook'	'Fairground wheel'	'Making a moving monster'	
Skills	Design	Design a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move. Create clearly labelled drawings that illustrate movement. <i>Design simple products that work and look appealing. Discuss and draw ideas and use ICT to communicate.</i>	Explain how to adapt mechanisms, using bridges or guides to control the movement. Designing a moving story book for a given audience. <i>Design simple products that work and look appealing. Discuss and draw ideas and use ICT to communicate.</i>	Select a suitable linkage system to produce the desired motion. Design a wheel. <i>Design products for others and themselves that are purposeful, functional and appealing. Generate, develop, model and communicate ideas through talking, drawing, templates and ICT.</i>	Create a class design criteria for a moving monster. Design a moving monster for a specific audience in accordance with a design criteria. <i>Design products for others and themselves that are purposeful, functional and appealing. Generate, develop, model and communicate ideas through talking, drawing, templates and ICT.</i>	<i>Design purposeful, functional, appealing products for themselves and other users based on design criteria</i> <i>Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</i>
	Make	Adapt mechanisms, when: they do not work as they should. Fit their vehicle design. Improve how they work after testing their vehicle. <i>Use a range of materials and components eg construction, textiles and ingredients.</i>	Follow a design to create moving models that use levers and sliders. <i>Use a range of materials and components eg construction, textiles and ingredients. Use a range of tools and equipment to perform practical</i>	Select materials according to their characteristics. • Following a design brief. <i>Select from and use a wide range of materials and components (according to their characteristics) eg construction, textiles and ingredients.</i>	Make linkages using card for levers and split pins for pivots. • Experimenting with linkages adjusting the widths, lengths and thicknesses of card used. Cut and assemble components neatly. <i>Select from and use a wide range of materials and</i>	<i>Select from and use a range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing)</i> <i>Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</i>

		Use a range of tools and equipment to perform practical tasks eg cut, shape, join and finish.	tasks eg cut, shape, join and finish.	Select from and use a wide range of tools and equipment to perform practical tasks eg cut, shape, join and finish.	components (according to their characteristics) eg construction, textiles and ingredients. Select from and use a wide range of tools and equipment to perform practical tasks eg cut, shape, join and finish.	
	Evaluate	Test wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move. Explore existing products eg home, school. Discuss own ideas and designs.	Test 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. Explore existing products eg home, school. Discuss own ideas and designs.	Evaluate different designs. Test and adapt a design. Explore and evaluate a range of existing products eg home, school. Evaluate own ideas and designs against given design criteria.	Evaluate own designs against design criteria. Use peer feedback to modify a final design. Explore and evaluate a range of existing products eg home, school. Evaluate own ideas and designs against given design criteria.	Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria
Knowledge	Technical	Know that wheels need to be round to rotate and move. Understand that for a wheel to move it must be attached to a rotating axle. Know that an axle moves within an axle	Know that a mechanism is the parts of an object that move together. Know that a slider mechanism moves an object from side to side.	Know that different materials have different properties and are therefore suitable for different uses. Build structures, exploring ways to	Know that mechanisms are a collection of moving parts that work together as a machine to produce movement. Know that there is always an input and output in a mechanism. Know that an input is	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

		holder which is fixed to the vehicle or toy. Know that the frame of a vehicle (chassis) needs to be balanced. Start to build structures, exploring ways to stiffen, stable and strengthen. Explore simple mechanisms.	Know that a slider mechanism has a slider, slots, guides and an object. Know that bridges and guides are bits of card that purposefully restrict the movement of the slider. Start to build structures, exploring ways to stiffen, stable and strengthen. Explore simple mechanisms.	stiffen, stabilise and strengthen. Explore and use mechanisms eg levers, wheels and axles.	the energy that is used to start something working. • Know that an output is the movement that happens as a result of the input. • Know that a lever is something that turns on a pivot. Know that a linkage mechanism is made up of a series of levers. Build structures, exploring ways to stiffen, stabilise and strengthen. Explore and use mechanisms eg levers, wheels and axles	
	Additional	Know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles.	Know that in Design and technology we call a plan a 'design'.		Know some real-life objects that contain mechanisms.	

Mechanisms/ Mechanical systems				
		Year Three 'Pneumatic toys'	Year Four 'Making a slingshot car'	End of Key Stage Expectations
Skills	Design	<p>Design a toy which uses a pneumatic system. Develop design criteria from a design brief. Generate ideas using thumbnail sketches and exploded diagrams.</p> <p>Learn that different types of drawings are used in design to explain ideas clearly.</p> <p>Communicate ideas using different strategies eg discussion, sketch.</p> <p>Use research to inform design.</p> <p>Take risks to become innovative and resourceful.</p>	<p>Design a shape that reduces air resistance. Draw a net to create a structure from. Choose shapes that increase or decrease speed as a result of air resistance.</p> <p>Personalise a design.</p> <p>Communicate, generate and develop ideas using a range of strategies eg prototypes, pattern pieces.</p> <p>Use research to inform design and develop design criteria.</p> <p>Take risks to become innovative and resourceful.</p>	<p>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</p> <p>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p>
	Make	<p>Create a pneumatic system to create a desired motion.</p> <p>Build secure housing for a pneumatic system.</p> <p>Use syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy.</p> <p>Select materials due to their functional and aesthetic characteristics.</p> <p>Manipulate materials to create different effects by cutting, creasing, folding and weaving.</p> <p>Select from and use a wider range of tools, equipment, materials and components accurately.</p>	<p>Measure, mark, cut and assemble with increasing accuracy.</p> <p>Make a model based on a chosen design.</p> <p>Select from and use a wider range of tools, equipment, materials and components accurately to make prototypes.</p>	<p>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p> <p>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>

	Evaluate	<p>Use the views of others to improve designs. Test and modifying the outcome, suggesting improvements.</p> <p>Understand the purpose of exploded-diagrams through the eyes of a designer and their client.</p> <p>Evaluate own ideas and designs against given design criteria and consider the views of others to improve their work.</p> <p>Investigate a range of existing products that address real / relevant problems, in a range of relevant contexts eg home, leisure, school.</p>	<p>Evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.</p> <p>Evaluate own ideas and designs against given design criteria and consider the views of others to improve their work.</p> <p>Investigate a range of existing products in a range of relevant contexts eg culture, industry.</p>	<p>Investigate and analyse a range of existing products</p> <p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p> <p>Understand how key events and individuals in design and technology have helped shape the world</p>
Knowledge	Technical	<p>Understand how pneumatic systems work. Understand that pneumatic systems can be used as part of a mechanism.</p> <p>Know that pneumatic systems operate by drawing in, releasing and compressing air.</p> <p>Apply understanding of how to strengthen, stiffen and reinforce structures.</p> <p>Identify range of mechanical systems and how they work (gears, pulleys, cams, levers and linkages).</p>	<p>Understand that all moving things have kinetic energy.</p> <p>Understand that kinetic energy is the energy that something (object/person) has by being in motion.</p> <p>Know that air resistance is the level of drag on an object as it is forced through the air.</p> <p>Understand that the shape of a moving object will affect how it moves due to air resistance.</p> <p>Apply understanding of how to strengthen, stiffen in order to reinforce more complex structures.</p> <p>Use computing to program, monitor and control products.</p> <p>Identify wider range of mechanical systems and how they work (gears, pulleys, cams, levers and linkages).</p> <p>Use understanding of electrical systems (series circuits, switches, bulbs and motors).</p>	<p>Apply their understanding of how to strengthen, stiffen and reinforce more complex structures</p> <p>Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)</p> <p>Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors)</p> <p>Apply their understanding of computing to program, monitor and control their products.</p>

	Additional	<p>Understand how sketches, drawings and diagrams can be used to communicate design ideas.</p> <p>Know that exploded-diagrams are used to show how different parts of a product fit together.</p> <p>Know that thumbnail sketches are small drawings to get ideas down on paper quickly.</p>	<p>Understand that products change and evolve over time.</p> <p>Know that aesthetics means how an object or product looks in design and technology.</p> <p>Know that a template is a stencil you can use to help you draw the same shape accurately.</p> <p>Know that a birds-eye view means a view from a high angle (as if a bird in flight).</p> <p>Know that graphics are images which are designed to explain or advertise something.</p> <p>Know that it is important to assess and evaluate design ideas and models against a list of design criteria.</p>	
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Mechanisms/ Mechanical systems				
		Year Five 'Pop-up book'	Year Six 'Automata toys'	End of Key Stage Expectations
Skills	Design	<p>Design a pop-up book which uses a mixture of structures and mechanisms. Name each mechanism, input and output accurately. Storyboard ideas for a book.</p> <p><i>Communicate, generate, develop and model ideas using a range of strategies eg computer-aided-design, cross-sectional and exploded diagrams.</i></p> <p><i>Use research to inform design and generate own design criteria.</i></p> <p><i>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing.</i></p> <p><i>Confidently take calculated risks to become innovative, resourceful and enterprising</i></p>	<p>Experiment with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement. Understand how linkages change the direction of a force. Make things move at the same time. Understand and draw cross-sectional diagrams to show the inner-workings of my design.</p> <p><i>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing.</i></p> <p><i>Use research to inform innovative design and generate own design criteria.</i></p> <p><i>Confidently take calculated risks to become innovative, resourceful and enterprising.</i></p>	<p><i>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</i></p> <p><i>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</i></p>
	Make	<p>Follow a design brief to make a pop-up book, neatly and with focus on accuracy. Make mechanisms and/or structures using sliders, pivots and folds to produce movement. Use layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.</p> <p><i>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes.</i></p>	<p>Measure, mark and check the accuracy of the jelutong and dowel pieces required. Measure marking and cutting components accurately using a ruler and scissors. Assemble components accurately to make a stable frame. Understand that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles. Select appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set.</p> <p><i>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and</i></p>	<p><i>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</i></p> <p><i>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</i></p>

			components accurately to make high quality prototypes.	
	Evaluate	<p>Evaluate the work of others and receiving feedback on own work. Suggest points for improvement. Generate own design criteria and evaluate ideas and products against these. Investigate and analyse a range of existing products that address real / relevant problems, in a range of relevant contexts. Understand how key events and individuals in D&T helped to shape the world.</p>	<p>Evaluate the work of others and receiving feedback on own work. Apply points of improvement to their toys. Describe changes they would make/do if they were to do the project again. Generate own design criteria and critique ideas and products against these. Explain and understand how key events and individuals in D&T helped to shape the world.</p>	<p>Investigate and analyse a range of existing products Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work Understand how key events and individuals in design and technology have helped shape the world</p>
Knowledge	Technical	<p>Know that mechanisms control movement. Understand that mechanisms can be used to change one kind of motion into another. Understand how to use sliders, pivots and folds to create paper-based mechanisms. Construct more complex structures by applying range of strategies in order to solve real / relevant problems. Drawing on disciplines & making connections to wider subject areas, apply understanding of computing to program, monitor and control products. Making connections to real & relevant problems, apply understanding of wider range of mechanical systems (gears, pulleys, cams, levers and linkages). Making connections to real & relevant problems, apply understanding of electrical systems (series circuits, switches, bulbs and motors).</p>	<p>Understand that the mechanism in an automata uses a system of cams, axles and followers. Understand that different shaped cams produce different outputs.</p>	<p>Apply their understanding of how to strengthen, stiffen and reinforce more complex structures Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages) Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors) Apply their understanding of computing to program,</p>

				monitor and control their products.
	Additional	<p>Know that a design brief is a description of what I am going to design and make.</p> <p>Know that designers often want to hide mechanisms to make a product more aesthetically pleasing.</p>	<p>Know that an automata is a hand powered mechanical toy.</p> <p>Know that a cross-sectional diagram shows the inner workings of a product.</p> <p>Understand how to use a bench hook and saw safely.</p> <p>Know that a set square can be used to help mark 90° angles.</p>	

Electrical systems (KS2 only)				
		Year Three	Year Four 'Torches'	End of Key Stage Expectations
Skills	Design	N/A No Electrical Systems unit in Y3	Design a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. <i>Communicate, generate and develop ideas using a range of strategies eg prototypes, pattern pieces.</i> <i>Use research to inform design and develop design criteria.</i> <i>Take risks to become innovative and resourceful.</i>	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design
	Make		Make a torch with a working electrical circuit and switch. Use appropriate equipment to cut and attach materials. Assemble a torch according to the design and success criteria. <i>Select from and use a wider range of tools, equipment, materials and components accurately to make prototypes.</i>	Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

	Evaluate		<p>Evaluate electrical products. Test and evaluating the success of a final product.</p>	<p>Investigate and analyse a range of existing products</p> <p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p> <p>Understand how key events and individuals in design and technology have helped shape the world</p>
Knowledge	Technical		<p>Understand that electrical conductors are materials which electricity can pass through. Understand that electrical insulators are materials which electricity cannot pass through. Know that a battery contains stored electricity that can be used to power products. Know that an electrical circuit must be complete for electricity to flow. Know that a switch can be used to complete and break an electrical circuit. Use understanding of electrical systems (series circuits, switches, bulbs and motors).</p>	<p>Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors)</p>
	Additional		<p>Know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. Know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison.</p>	<p>Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors)</p>

Electrical systems (KS2 only)				
		Year Five 'Doodlers'	Year Six 'Steady hand game'	End of Key Stage Expectations
Skills	Design	<p>Identify factors that could be changed on existing products and explaining how these would alter the form and function of the product.</p> <p>Develop design criteria based on findings from investigating existing products. Develop design criteria that clarifies the target user.</p> <p><i>Communicate, generate, develop and model ideas using a range of strategies eg computer-aided-design, cross-sectional and exploded diagrams.</i></p> <p><i>Use research to inform design and generate own design criteria.</i></p> <p><i>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing.</i></p> <p><i>Confidently take calculated risks to become innovative, resourceful and enterprising</i></p>	<p>Design a steady hand game - identifying and naming the components required. Draw a design from three different perspectives.</p> <p>Generate ideas through sketching and discussion.</p> <p>Model ideas through prototypes. Understand the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.</p> <p><i>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing.</i></p> <p><i>Use research to inform innovative design and generate own design criteria.</i></p> <p><i>Confidently take calculated risks to become innovative, resourceful and enterprising.</i></p>	<p>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</p> <p><i>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</i></p>
	Make	<p>Alter a product's form and function by tinkering with its configuration.</p> <p>Make a functional series circuit, incorporating a motor.</p> <p>Construct a product with consideration for the design criteria.</p> <p>Break down the construction process into steps so that others can make the product.</p> <p><i>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes.</i></p>	<p>Construct a stable base for a game. Accurately cut, fold and assemble a net. Decorate the base of the game to a high quality finish.</p> <p>Make and testing a circuit.</p> <p>Incorporate a circuit into a base.</p> <p><i>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes.</i></p>	<p>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p> <p><i>Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional</i></p>

				properties and aesthetic qualities
	Evaluate	<p>Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses.</p> <p>Determine which parts of a product affect its function and which parts affect its form.</p> <p>Analyse whether changes in configuration positively or negatively affect an existing product.</p> <p>Peer evaluate a set of instructions to build a product.</p> <p><i>Generate own design criteria and evaluate ideas and products against these.</i></p> <p><i>Investigate and analyse a range of existing products that address real / relevant problems, in a range of relevant contexts.</i></p> <p><i>Understand how key events and individuals in D&T helped to shape the world.</i></p>	<p>Test own and others finished games, identifying what went well and making suggestions for improvement.</p> <p>Gather images and information about existing children's toys.</p> <p>Analyse a selection of existing children's toys.</p> <p><i>Generate own design criteria and critique ideas and products against these.</i></p> <p><i>Explain and understand how key events and individuals in D&T helped to shape the world.</i></p>	<p>Investigate and analyse a range of existing products</p> <p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p> <p>Understand how key events and individuals in design and technology have helped shape the world</p>
Knowledge	Technical	<p>Know that series circuits only have one direction for the electricity to flow.</p> <p>Know when there is a break in a series circuit, all components turn off.</p> <p>Know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.</p> <p>Know a motorised product is one which uses a motor to function.</p> <p><i>Making connections to real & relevant problems, apply understanding of electrical systems (series circuits, switches, bulbs and motors).</i></p>	<p>Know that batteries contain acid, which can be dangerous if they leak.</p> <p>Know the names of the components in a basic series circuit, including a buzzer.</p> <p><i>Making connections to real & relevant problems, apply understanding of electrical systems (series circuits, switches, bulbs and motors).</i></p>	<p>Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors)</p>
	Additional	<p>Know that product analysis is critiquing the strengths and weaknesses of a product.</p> <p>Know that 'configuration' means how the parts of a product are arranged.</p>	<p>Know that 'form' means the shape and appearance of an object.</p> <p>Know the difference between 'form' and 'function'.</p>	

			<p>Understand that 'fit for purpose' means that a product works how it should and is easy to use. Know that form over purpose means that a product looks good but does not work very well. Know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind. Understand the diagram perspectives 'top view', 'side view' and 'back'</p>	
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Food					
		EYFS (Reception)	Year One 'Smoothies'	Year Two 'Balanced diet'	End of Key Stage Expectations
Skills	Design	<p>Design snacks for the following events: Christmas Crafts Parent and carer workshop Mother's Day breakfast Father's Day breakfast</p> <p>Use what they have learned about media and materials in original ways, thinking about uses and purpose. Represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role-play and stories.</p>	<p>Design smoothie carton packaging by-hand or on ICT software.</p> <p>Design simple products that work and look appealing. Discuss and draw ideas and use ICT to communicate.</p>	<p>Design a healthy wrap based on a food combination which work well together.</p> <p>Design products for others and themselves that are purposeful, functional and appealing. Generate, develop, model and communicate ideas through talking, drawing, templates and ICT.</p>	<p>Design purposeful, functional, appealing products for themselves and other users based on design criteria</p> <p>Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</p>
	Make	<p>Design snacks for the following events: Christmas Crafts Parent and carer workshop Mother's Day breakfast Father's Day breakfast</p> <p>Safely use and explore a variety of materials, tools and techniques.</p>	<p>Chop fruit and vegetables safely to make a smoothie.</p> <p>Use a range of materials and components eg construction, textiles and ingredients. Use a range of tools and equipment to perform practical tasks eg cut, shape, join and finish.</p>	<p>Slice food safely using the bridge or claw grip. Construct a wrap that meets a design brief.</p> <p>Select from and use a wide range of materials and components (according to their characteristics) eg construction, textiles and ingredients. Select from and use a wide range of tools and equipment to perform practical tasks eg cut, shape, join and finish.</p>	<p>ELG: EAD (Creating with Materials): Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; Select from and use a range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing)</p>

					Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics
Evaluate	<p>Taste and evaluate the food made for the following events:</p> <p>Christmas Crafts Parent and carer workshop Mother's Day breakfast Father's Day breakfast</p>	<p>Taste and evaluating different food combinations. Describe appearance, smell and taste. Suggest information to be included on packaging.</p> <p>Explore existing products eg home, school. Discuss own ideas and designs.</p>	<p>Describe the taste, texture and smell of fruit and vegetables.</p> <p>Taste testing food combinations and final products.</p> <p>Describe the information that should be included on a label.</p> <p>Evaluate which grip was most effective.</p> <p>Explore and evaluate a range of existing products eg home, school.</p> <p>Evaluate own ideas and designs against given design criteria.</p>	<p>ELG: EAD (Creating with Materials): Share their creations, explaining the process they have used</p> <p>Explore and evaluate a range of existing products</p> <p>Evaluate their ideas and products against design criteria</p>	

<p>Knowledge</p>	<p>Cooking and nutrition</p>	<p>Know that soup is ingredients (usually vegetables and liquid) blended together. Know that vegetables are grown. Recognise and name some common vegetables. Know that different vegetables taste different. Know that eating vegetables is good for us. Discuss why different packages might be used for different foods.</p>	<p>Understand the difference between fruits and vegetables. Understand that some foods typically known as vegetables are actually fruits (e.g. cucumber). Know that a blender is a machine which mixes ingredients together into a smooth liquid. Know that a fruit has seeds and a vegetable does not. Know that fruits grow on trees or vines. Know that vegetables can grow either above or below ground. Know that vegetables can come from different parts of the plant. <i>Begin to understand where food comes from.</i> <i>Prepare simple dishes using knowledge of healthy food.</i></p>	<p>Know that 'diet' means the food and drink that a person or animal usually eats. Understand what makes a balanced diet. Know where to find the nutritional information on packaging. Know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. Understand that I should eat a range of different foods from each food group, and roughly how much of each food group. Know that nutrients are substances in food that all living things need to make energy, grow and develop. Know that 'ingredients' means the items in a mixture or recipe. Know that I should only have a maximum of five teaspoons of sugar a day to stay healthy. Know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'. <i>Understand where food comes from.</i> <i>Use basic principles of a healthy and varied diet to prepare dishes.</i></p>	<p><i>Use the basic principles of a healthy and varied diet to prepare dishes</i></p> <p><i>Understand where food comes from</i></p>
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Food				
		Year Three 'Eating seasonally'	Year Four 'Adapting a recipe'	End of Key Stage Expectations
Skills	Design	<p>Create a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.</p> <p>Communicate ideas using different strategies eg discussion, sketch.</p> <p>Use research to inform design.</p> <p>Take risks to become innovative and resourceful.</p>	<p>Design a biscuit within a given budget, drawing upon previous taste testing judgements.</p> <p>Communicate, generate and develop ideas using a range of strategies eg prototypes, pattern pieces.</p> <p>Use research to inform design and develop design criteria.</p> <p>Take risks to become innovative and resourceful.</p>	<p>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</p> <p>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p>
	Make	<p>Know how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination.</p> <p>Follow the instructions within a recipe.</p> <p>Select from and use a wider range of tools, equipment, materials and components accurately</p>	<p>Follow a baking recipe, from start to finish, including the preparation of ingredients.</p> <p>Cook safely, following basic hygiene rules.</p> <p>Adapt a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet).</p> <p>Select from and use a wider range of tools, equipment, materials and components accurately to make prototypes.</p>	<p>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p> <p>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>
	Evaluate	<p>Establish and using design criteria to help test and review dishes.</p>	<p>Evaluate a recipe, considering: taste, smell, texture and appearance.</p>	<p>Investigate and analyse a range of existing products</p>

		<p>Describe the benefits of seasonal fruits and vegetables and the impact on the environment. Suggest points for improvement when making a seasonal tart.</p> <p>Evaluate own ideas and designs against given design criteria and consider the views of others to improve their work.</p> <p>Investigate a range of existing products that address real / relevant problems, in a range of relevant contexts eg home, leisure, school.</p>	<p>Describe the impact of the budget on the selection of ingredients.</p> <p>Evaluate and comparing a range of food products.</p> <p>Suggest 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> <p>Evaluate own ideas and designs against given design criteria and consider the views of others to improve their work.</p> <p>Investigate a range of existing products in a range of relevant contexts eg culture, industry.</p>	<p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p> <p>Understand how key events and individuals in design and technology have helped shape the world</p>
Knowledge	Cooking and nutrition	<p>Know that not all fruits and vegetables can be grown in the UK.</p> <p>Know that climate affects food growth.</p> <p>Know that vegetables and fruit grow in certain seasons.</p> <p>Know that cooking instructions are known as a 'recipe'.</p> <p>Know that imported food is food which has been brought into the country.</p> <p>Know that exported food is food which has been sent to another country.</p> <p>Understand that imported foods travel from far away and this can negatively impact the environment.</p> <p>Know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre.</p> <p>Understand that vitamins, minerals and fibre are important for energy, growth and maintaining health.</p> <p>Know safety rules for using, storing and cleaning a knife safely.</p>	<p>Know that the amount of an ingredient in a recipe is known as the 'quantity.'</p> <p>Know that it is important to use oven gloves when removing hot food from an oven.]</p> <p>Know the following cooking techniques: sieving, creaming, rubbing method, cooling.</p> <p>Understand the importance of budgeting while planning ingredients for biscuits.</p> <p>Know where and how a variety of ingredients are grown, reared, caught and processed.</p>	<p>Understand and apply the principles of a healthy and varied diet</p> <p>Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques</p> <p>Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed</p>

		<p>Know that similar coloured fruits and vegetables often have similar nutritional benefits.</p> <p>Apply principles of a healthy, varied diet when preparing variety of savoury dishes.</p> <p>Apply understanding of seasonality and its link to ingredients.</p>		
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Food				
		Year Five 'Developing a recipe'	Year Six 'Come dine with me'	End of Key Stage Expectations
Skills	Design	<p>Adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.</p> <p>Write an amended method for a recipe to incorporate the relevant changes to ingredients.</p> <p>Design appealing packaging to reflect a recipe.</p> <p>Communicate, generate, develop and model ideas using a range of strategies eg computer-aided-design, cross-sectional and exploded diagrams.</p> <p>Use research to inform design and generate own design criteria.</p> <p>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing.</p> <p>Confidently take calculated risks to become innovative, resourceful and enterprising</p>	<p>Write a recipe, explaining the key steps, method and ingredients.</p> <p>Include facts and drawings from research undertaken.</p> <p>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing.</p> <p>Use research to inform innovative design and generate own design criteria.</p> <p>Confidently take calculated risks to become innovative, resourceful and enterprising.</p>	<p>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</p> <p>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p>
	Make	Cut and preparing vegetables safely.	Follow a recipe, including using the correct quantities of each ingredient.	Select from and use a wider range of tools and equipment

		<p>Use equipment safely, including knives, hot pans and hobs. Know how to avoid cross-contamination. Follow a step by step method carefully to make a recipe. <i>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes.</i></p>	<p>Adapt a recipe based on research. Work to a given timescale. Work safely and hygienically with independence. <i>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes.</i></p>	<p>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>
	Evaluate	<p>Identify the nutritional differences between different products and recipes. Identify and describing healthy benefits of food groups. <i>Generate own design criteria and evaluate ideas and products against these. Investigate and analyse a range of existing products that address real / relevant problems, in a range of relevant contexts. Understand how key events and individuals in D&T helped to shape the world.</i></p>	<p>Know that 'flavour' is how a food or drink tastes. Know that many countries have 'national dishes' which are recipes associated with that country. Know that 'processed food' means food that has been put through multiple changes in a factory. Understand that it is important to wash fruit and vegetables 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). <i>Generate own design criteria and critique ideas and products against these. Explain and understand how key events and individuals in D&T helped to shape the world.</i></p>	<p>Investigate and analyse a range of existing products Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work Understand how key events and individuals in design and technology have helped shape the world</p>

<p>Knowledge</p>	<p>Cooking and nutrition</p>	<p>Understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues. Know that I can adapt a recipe to make it healthier by substituting ingredients. Know that I can use a nutritional calculator to see how healthy a food option is. Understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects. Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.</p>	<p>Know that 'flavour' is how a food or drink tastes. 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. Understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. Understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork). Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. Know where and how a variety of ingredients are grown, reared, caught and processed and its impact on meal design. Develop crucial life skill of feeding themselves and others affordably and well.</p>	
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Textiles					
		EYFS (Reception) 'Bookmarks'	Year One 'Puppets'	Year Two 'Pouches'	End of Key Stage Expectations
Skills	Design	<p>Discussing what a good design needs.</p> <p>Design a simple pattern with paper.</p> <p>Design a bookmark.</p> <p>Choose from available materials.</p> <p>Use what they have learned about media and materials in original ways, thinking about uses and purpose.</p> <p>Represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role-play and stories.</p>	<p>Use a template to create a design for a puppet.</p> <p>Design simple products that work and look appealing.</p> <p>Discuss and draw ideas and use ICT to communicate.</p>	<p>Design a pouch.</p> <p>Design products for others and themselves that are purposeful, functional and appealing.</p> <p>Generate, develop, model and communicate ideas through talking, drawing, templates and ICT.</p>	<p>Design purposeful, functional, appealing products for themselves and other users based on design criteria</p> <p>Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</p>
	Make	<p>Develop fine motor/cutting skills with scissors. Explore fine motor/threading and weaving (under, over technique) with a variety of materials.</p> <p>Use a prepared needle and wool to practise threading.</p> <p>Safely use and explore a variety of materials, tools and techniques.</p>	<p>Cut fabric neatly with scissors.</p> <p>Use joining methods to decorate a puppet.</p> <p>Sequence steps for construction.</p> <p>Use a range of materials and components eg construction, textiles and ingredients.</p> <p>Use a range of tools and equipment to perform practical tasks eg cut, shape, join and finish.</p>	<p>Select and cutting fabrics for sewing.</p> <p>Decorate a pouch using fabric glue or running stitch.</p> <p>Thread a needle.</p> <p>Sew running stitch, with evenly spaced, neat, even stitches to join fabric.</p> <p>Neatly pin and cut fabric using a template.</p> <p>Select from and use a wide range of materials and components (according to their characteristics) eg construction, textiles and ingredients.</p>	<p>ELG: EAD (Creating with Materials):</p> <p>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function</p> <p>Select from and use a range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing)</p>

				Select from and use a wide range of tools and equipment to perform practical tasks eg cut, shape, join and finish.	Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics
	Evaluate	Reflect on a finished product and comparing to their design.	Reflect on a finished product, explaining likes and dislikes. Explore existing products eg home, school. Discuss own ideas and designs.	Troubleshoot scenarios posed by teacher. Evaluate the quality of the stitching on others' work. Discuss as a class, the success of their stitching against the success criteria. Identify aspects of their peers' work that they particularly like and why. Explore and evaluate a range of existing products eg home, school. Evaluate own ideas and designs against given design criteria.	ELG: EAD (Creating with Materials): Share their creations, explaining the process they have used Explore and evaluate a range of existing products Evaluate their ideas and products against design criteria

Knowledge	<p>Know that a design is a way of planning ideas before starting. Know that threading is putting one material through an object.</p> <p>Use what they have learned about media and materials in original ways, thinking about uses and purposes.</p>	<p>Know that 'joining technique' means connecting two pieces of material together. Know that there are various temporary methods of joining fabric by using staples, glue or pins. Understand that different techniques for joining materials can be used for different purposes. Understand that a template (or fabric pattern) is used to cut out the same shape multiple times. Know that drawing a design idea is useful to see how an idea will look.</p>	<p>Know that sewing is a method of joining fabric. Know that different stitches can be used when sewing. Understand the importance of tying a knot after sewing the final stitch. Know that a thimble can be used to protect my fingers when sewing.</p>	
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Textiles				
		Year Three Cross stitch and applique 'Cushions'	Year Four 'Fastenings'	End of Key Stage Expectations
Skills	Design	<p>Design and make a template from an existing cushion and apply individual design criteria.</p> <p>Communicate ideas using different strategies eg discussion, sketch.</p> <p>Use research to inform design.</p> <p>Take risks to become innovative and resourceful.</p>	<p>Write design criteria for a product, articulating decisions made.</p> <p>Design a personalised book sleeve.</p> <p>Communicate, generate and develop ideas using a range of strategies eg prototypes, pattern pieces.</p> <p>Use research to inform design and develop design criteria.</p> <p>Take risks to become innovative and resourceful.</p>	<p>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</p> <p>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams,</p>

				prototypes, pattern pieces and computer-aided design
Make	<p>Follow design criteria to create a cushion or Egyptian collar.</p> <p>Selecting and cutting fabrics with ease using fabric scissors.</p> <p>Thread needles with greater independence.</p> <p>Tie knots with greater independence. Sew cross stitch to join fabric.</p> <p>Decorate fabric using appliqué. Complete design ideas with stuffing and sewing the edges (Cushions) or embellishing the collars based on design ideas (Egyptian collars).</p> <p>Select from and use a wider range of tools, equipment, materials and components accurately.</p>	<p>Make and test a paper template with accuracy and in keeping with the design criteria.</p> <p>Measure, mark and cut fabric using a paper template.</p> <p>Select a stitch style to join fabric.</p> <p>Work neatly by sewing small, straight stitches.</p> <p>Incorporate a fastening to a design.</p> <p>Select from and use a wider range of tools, equipment, materials and components accurately to make prototypes.</p>	<p>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p> <p>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>	
Evaluate	<p>Evaluate an end product and thinking of other ways in which to create similar items.</p> <p>Evaluate own ideas and designs against given design criteria and consider the views of others to improve their work.</p> <p>Investigate a range of existing products that address real / relevant problems, in a range of relevant contexts eg home, leisure, school.</p>	<p>Test and evaluate an end product against the original design criteria.</p> <p>Decide how many of the criteria should be met for the product to be considered successful.</p> <p>Suggest modifications for improvement.</p> <p>Articulate the advantages and disadvantages of different fastening types.</p> <p>Evaluate own ideas and designs against given design criteria and consider the views of others to improve their work.</p> <p>Investigate a range of existing products in a range of relevant contexts eg culture, industry.</p>	<p>Investigate and analyse a range of existing products</p> <p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p> <p>Understand how key events and individuals in design and technology have helped shape the world</p>	

<p>Knowledge</p>	<p>Know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. Know that when two edges of fabric have been joined together it is called a seam. Know that it is important to leave space on the fabric for the seam. Understand that some products are turned inside out after sewing so the stitching is hidden.</p>	<p>Know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro. Know that different fastening types are useful for different purposes. Know that creating a mock up (prototype) of their design is useful for checking ideas and proportions.</p>	
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Textiles	
Year Five	Year Six
<p>N/A</p> <p>No Textiles units in Year 5 or Year 6</p>	

Digital World (KS2 only)				
		Year Three "Wearable technology"	Year Four	End of Key Stage Expectations
Skills	Design	<p>Problem solve by suggesting potential features on a Micro: bit and justifying own ideas. Develop design ideas through annotated sketches to create a product concept. Draw and manipulate 2D shapes, using computer-aided design, to produce a point of sale badge. Develop a design criteria to respond to a design brief.</p> <p><i>Communicate ideas using different strategies eg discussion, sketch.</i> <i>Use research to inform design.</i> <i>Take risks to become innovative and resourceful.</i></p>	<p>N/A No Digital World unit in Y4</p>	<p>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</p> <p>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p>
	Make	<p>Follow a list of design requirements. Write a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm.</p> <p><i>Select from and use a wider range of tools, equipment, materials and components accurately.</i></p>		<p>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p> <p>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>

	Evaluate	<p>Evaluate own ideas and designs against given design criteria and consider the views of others to improve their work.</p> <p>Investigate a range of existing products that address real / relevant problems, in a range of relevant contexts eg home, leisure, school.</p>		<p>Investigate and analyse a range of existing products</p> <p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p> <p>Understand how key events and individuals in design and technology have helped shape the world</p>
Knowledge	Technical	<p>Understand that, in programming, a 'loop' is code that repeats something again and again until stopped.</p> <p>Know that a micro:bit is a pocket-sized, codeable computer.</p> <p>Know that a simulator is able to replicate the functions of an existing piece of technology.</p> <p>Use computing to program, monitor and control products.</p>		<p>Apply their understanding of computing to program, monitor and control their products.</p>
	Additional	<p>Understand what is meant by 'point of sale display.'</p> <p>Know that CAD stands for 'Computer-aided design'</p>		

Digital World (KS2 only)				
		Year Five 'Monitoring devices'	Year Six 'Navigating the world'	End of Key Stage Expectations
Skills	Design	<p>Research (books, internet) for a particular (user's) animal's needs. Develop design criteria based on research. Generate multiple housing ideas using building bricks. Understand what a virtual model is and the pros and cons of traditional and CAD modelling. Place and manoeuvre 3D objects, using CAD. Change the properties of, or combining one or more 3D objects, using CAD.</p> <p><i>Communicate, generate, develop and model ideas using a range of strategies eg computer-aided-design, cross-sectional and exploded diagrams.</i> <i>Use research to inform design and generate own design criteria.</i> <i>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing.</i> <i>Confidently take calculated risks to become innovative, resourceful and enterprising</i></p>	<p>Write a design brief from information submitted by a client. Develop design criteria to fulfil the client's request. Consider and suggesting additional functions for my navigation tool. Develop a product idea through annotated sketches. Place and manoeuvre 3D objects, using CAD. Change the properties of, or combining one or more 3D objects, using CAD.</p> <p><i>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing.</i> <i>Use research to inform innovative design and generate own design criteria.</i> <i>Confidently take calculated risks to become innovative, resourceful and enterprising.</i></p>	<p><i>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</i></p> <p><i>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</i></p>
	Make	<p>Understand the functional and aesthetic properties of plastics. Programme to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range.</p> <p><i>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes.</i></p>	<p>Consider materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). Explain material choices and why they were chosen as part of a product concept. Programme a N,E, S, W cardinal compass.</p> <p><i>According to their functional properties and aesthetic qualities, select from and use a wide range of tools, equipment, materials and components accurately to make high quality prototypes.</i></p>	<p><i>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</i> <i>Select from and use a wider range of materials and components, including construction materials, textiles and ingredients,</i></p>

				according to their functional properties and aesthetic qualities
	Evaluate	<p>State an event or fact from the last 100 years of plastic history.</p> <p>Explain how plastic is affecting planet Earth and suggesting ways to make more sustainable choices.</p> <p>Explain key functions in my program (audible alert, visuals).</p> <p>Explain how my product would be useful for an animal carer including programmed features.</p> <p><i>Generate own design criteria and evaluate ideas and products against these.</i></p> <p><i>Investigate and analyse a range of existing products that address real / relevant problems, in a range of relevant contexts.</i></p> <p><i>Understand how key events and individuals in D&T helped to shape the world.</i></p>	<p>Explain how my program fits the design criteria and how it would be useful as part of a navigation tool.</p> <p>Develop an awareness of sustainable design.</p> <p>Identify key industries that utilise 3D CAD modelling and explaining why.</p> <p>Describe how the product concept fits the client's request and how it will benefit the customers.</p> <p>Explain the key functions in my program, including any additions.</p> <p>Explain how my program fits the design criteria and how it would be useful as part of a navigation tool.</p> <p>Explain the key functions and features of my navigation tool to the client as part of a product concept pitch.</p> <p>Demonstrate a functional program as part of a product concept pitch.</p> <p><i>Generate own design criteria and critique ideas and products against these.</i></p> <p><i>Explain and understand how key events and individuals in D&T helped to shape the world.</i></p>	<p>Investigate and analyse a range of existing products</p> <p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p> <p>Understand how key events and individuals in design and technology have helped shape the world</p>
Knowledge	Technical	<p>Know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record.</p> <p>Know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose.</p> <p>Understand that conditional statements (and, or, if booleans) in programming are a set of</p>	<p>Know that accelerometers can detect movement.</p> <p>Understand that sensors can be useful in products as they mean the product can function without human input.</p> <p><i>Drawing on disciplines & making connections to wider subject areas, apply understanding of computing to program, monitor and control products</i></p>	<p>Apply their understanding of computing to program, monitor and control their products</p>

		<p>rules which are followed if certain conditions are met.</p> <p>Drawing on disciplines & making connections to wider subject areas, apply understanding of computing to program, monitor and control products.</p>		
	Additional	<p>Understand key developments in thermometer history.</p> <p>Know events or facts that took place over the last 100 years in the history of plastic, and how this is changing our outlook on the future.</p> <p>Know the 6Rs of sustainability.</p> <p>Understand what a virtual model is and the pros and cons of traditional vs CAD modelling.</p>	<p>Know that designers write design briefs and develop design criteria to enable them to fulfil a client's request.</p> <p>Know that 'multifunctional' means an object or product has more than one function.</p> <p>Know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.</p>	