



Design and Technology (DT) Overview 2024-2025

Intent

The intent of DT lessons in Bassingbourn Community Primary School is to provide children with a real-life context for learning. The intent is to develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world. The intent is to offer a structure and sequence of units to help teachers ensure they have covered the skills required to meet the aims of the national curriculum. The intent is to ensure that all pupils have the opportunity to 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.

DT lessons enable children to aspire to be more through creating opportunities for them in the wider world. Through the DT curriculum, children should be inspired by engineers, designers, chefs and architects to enable them to create a range of structures, mechanisms, textiles, electrical systems and food products with a real-life purpose.

Implementation

At Bassingbourn, we plan our DT based on the Kapow scheme of work, as a whole school approach. The whole school overview ensures that there is progression throughout the school and that children are building upon knowledge learnt in previous years. The units are designed so that pupils develop knowledge and understanding of mechanics, mechanical structures, textiles, cooking and nutrition and in KS2 electrical systems and the digital world. We recognise that within classes, there is a wide variety of abilities and Kapow provides suitable learning opportunities that are matched to the needs of all children. In Early Years Foundation Stage (EYFS), DT is linked to the Early Learning Goals.

Impact

Teachers use their professional judgment considering the skills and knowledge the children have demonstrated over the course of a unit to assess attainment. Children's attainment is recorded in order to track progression and provide intervention where appropriate. Teachers make use of curriculum journeys in order to help children track their own learning progress. Children are also encouraged to discuss their experiences and feelings. Pupils at the school will be more prepared for the opportunities, responsibilities and experiences of later life. Further information regarding assessment of impact is available in the Assessment Guidance.

Curriculum Overview

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Reception	Transport		Water		Let's create toys	
Knowledge and Skills	Children in reception practice their DT skills during continuous provision where children have access to junk modelling throughout the year. Key skills are built upon and developed as the year progresses.					
	Creating their own transport models Holding scissors correctly to cut paper and cardboard boxes. Attach 2 pieces together using tape Use tape dispenser safely. Use PVA glue with accuracy and care to join 2 pieces together. Add embellishments to decorate their model.		Explore using fabric collage to create a decorative piece Introduce sewing skills to continuous provision, Draw designs for their ideas prior to making Evaluate their designs and models		Children consolidate previous knowledge and skills. Children work collaboratively to create models on a larger scale. Use split pins to join to parts of a model	
Year 1	Mechanisms	Structures	Textiles	Mechanisms	Cooking and nutrition	Curriculum consolidation
	Making a moving story book	Constructing a windmill	Puppets	Wheels and axles	Smoothies	
Knowledge	A mechanism is the parts of an object that move together. A slider mechanism moves an object from side to side or up and down.	The sails or blades of a windmill are moved by the wind. Windmills are used to generate power and were used for grinding flour.	To know that 'joining technique' means connecting two pieces of material together. To know that there are various temporary methods of joining fabric by	To know that wheels need to be round to rotate and move. To understand that for a wheel to move it must be attached to a rotating axle.	That a blender is a machine which mixes ingredients together into a smooth liquid. That a fruit has seeds and a vegetable does not. That fruits grow on trees or vines.	

	<p>A slider mechanism has a slider, slots, guides and an object.</p> <p>Bridges and guides are bits of card that purposefully restrict the movement of the slider.</p>	<p>A structure is something built for a reason.</p> <p>Stable structures do not topple.</p> <p>Adding weight to the base of a structure can make it more stable.</p>	<p>using staples, glue or pins.</p> <p>To understand that different techniques for joining materials can be used for different purposes.</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 drawing a design idea is useful to see how an idea will look.</p>	<p>To know that an axle moves within an axle holder which is fixed to the vehicle or toy.</p> <p>To know that the frame of a vehicle (chassis) needs to be balanced.</p> <p>To know some real-life items that use wheels.</p>	<p>That vegetables can grow either above or below ground.</p> <p>That vegetables are any edible part of a plant.</p>	
Skills	<p>Explaining how to adapt mechanisms, using bridges or guides to control the movement.</p> <p>Designing a moving storybook for a given audience.</p> <p>Following a design to create moving models that use levers and sliders.</p> <p>Testing a finished product, seeing whether it moves as planned and if not,</p>	<p>Finding the middle of an object.</p> <p>Puncturing holes.</p> <p>Adding weight to a structure.</p> <p>Creating supporting structures.</p> <p>Cutting evenly and carefully.</p> <p>Evaluating and improving a product.</p>	<p>Using a template to create a design for a puppet.</p> <p>Cutting fabric neatly with scissors.</p> <p>Using joining methods to decorate a puppet.</p> <p>Sequencing steps for construction.</p> <p>Reflecting on a finished product, explaining likes and dislikes.</p>	<p>Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move.</p> <p>Creating clearly labelled drawings that illustrate movement.</p> <p>Adapting mechanisms.</p> <p>Testing mechanisms, identifying what</p>	<p>Designing smoothie carton packaging by hand.</p> <p>Chopping fruit and vegetables safely to make a smoothie.</p> <p>Juicing fruits to make a smoothie.</p> <p>Identifying if a food is a fruit.</p> <p>Learning where and how fruits and vegetables grow.</p>	

	<p>explaining why and how it can be fixed.</p> <p>Reviewing the success of a product by testing it with its intended audience.</p>			<p>stops wheels from turning, knowing that a wheel needs an axle in order to move.</p>	<p>Tasting and evaluating different foods.</p> <p>Describing appearance, smell and taste.</p> <p>Suggesting information to be included on packaging.</p>	
Vocabulary	<p>adapt</p> <p>assemble</p> <p>design</p> <p>design criteria</p> <p>input</p> <p>mechanism</p> <p>model</p> <p>sliders</p> <p>test</p>	<p>axle</p> <p>base</p> <p>centre</p> <p>equal</p> <p>evaluate</p> <p>middle</p> <p>rotate</p> <p>rotor</p> <p>rotor blades</p> <p>sails</p> <p>same</p> <p>stable</p> <p>strong</p> <p>structure</p> <p>test</p> <p>weak</p> <p>wind</p> <p>windmill</p>	<p>decorate</p> <p>design</p> <p>fabric</p> <p>glue</p> <p>model</p> <p>hand puppet</p> <p>safety pin</p> <p>staple</p> <p>stencil</p> <p>template</p>	<p>axle</p> <p>axle holder</p> <p>chassis</p> <p>diagram</p> <p>dowel</p> <p>equipment</p> <p>mechanism</p> <p>wheel</p>	<p>blend</p> <p>blender</p> <p>chopping board</p> <p>compare</p> <p>cut</p> <p>design</p> <p>evaluate</p> <p>flavour</p> <p>fork</p> <p>fruit</p> <p>healthy</p> <p>ingredients</p> <p>juice</p> <p>juicer</p> <p>leaf</p> <p>plant</p> <p>recipe</p> <p>root</p> <p>seed</p> <p>select</p> <p>smoothie</p> <p>stem</p> <p>table knife</p> <p>taste</p> <p>tree</p> <p>vegetable</p> <p>vine</p>	

Year 2	Mechanisms	Cooking and nutrition	Mechanisms	Structures	Textiles	Curriculum consolidation
	Fairground wheel	Balanced diet	Making a moving monster	Baby bear's chair	Pouches	
Knowledge	<p>Everyday objects have mechanisms.</p> <p>Many things that move have parts inside to help them work.</p> <p>Mechanisms usually limit unwanted movement.</p> <p>Everyday objects utilise wheels and axles.</p> <p>Wheels must be able to turn to work effectively.</p> <p>Axles allow wheels to turn without falling off.</p> <p>The features of a fairground wheel include the wheel, frame, pods, axle and axle holder.</p>	<p>That 'diet' means the food and drink that a person or animal usually eats.</p> <p>What makes a balanced diet.</p> <p>That the five main food groups are: carbohydrates, fruits and vegetables, protein, dairy and oils and spreads.</p> <p>That I should eat a range of different foods from each food group, and roughly how much of each food group.</p> <p>That 'ingredients' means the items in a mixture or recipe.</p> <p>How to cut, grate, snip and spread to prepare foods.</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 an 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>To know that shapes and structures with wide, flat bases or legs are the most stable.</p> <p>To understand that the shape of a structure affects its strength.</p> <p>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>To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.</p>	<p>To know that sewing is a method of joining fabric.</p> <p>To know that different stitches can be used when sewing.</p> <p>To understand the importance of tying a knot after sewing the final stitch.</p> <p>To know that a thimble can be used to protect my fingers when sewing.</p>	

		How to review and give a score to evaluate.		To know that a 'strong' structure is one which does not break easily. To know that a 'stiff' structure or material is one which does not bend easily.		
Skills	<p>Conducting simple surveys or discussions to gather opinions on what others need or like in a design.</p> <p>Knowing that a survey is used to find out what people like.</p> <p>Using a simple design brief that outlines the intended use, target user, and key features of the product, to create simple design criteria.</p> <p>Knowing that a design brief helps to decide what to make.</p> <p>Knowing that design criteria are the steps for making a product successful.</p> <p>Creating ideas with design criteria in mind.</p> <p>Referring to specific parts of existing products when generating ideas.</p>	<p>Chopping foods safely to make a wrap.</p> <p>Grating foods to make a wrap.</p> <p>Snipping smaller foods instead of cutting.</p> <p>Spreading soft foods to make a wrap.</p> <p>Identifying the five food groups. Learning about a balanced diet.</p> <p>Tasting and evaluating different food combinations.</p>	<p>Creating a design criteria for a moving monster as a class.</p> <p>Designing a moving monster for a specific audience in accordance with a design criteria.</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. Cutting and assembling components neatly.</p> <p>Evaluating own designs against design criteria.</p>	<p>Generating and communicating ideas using sketching and modelling.</p> <p>Learning about different types of structures, found in the natural world and in everyday objects.</p> <p>Making a structure according to design criteria.</p> <p>Creating joints and structures from paper/card and tape.</p> <p>Building a strong and stiff structure by folding paper.</p>	<p>Designing a pouch.</p> <p>Selecting and cutting fabrics for sewing.</p> <p>Decorating a pouch using fabric glue or running stitch.</p> <p>Threading a needle.</p> <p>Sewing running stitch, with evenly spaced, neat, even stitches to join fabric.</p> <p>Neatly pinning and cutting fabric using a template.</p> <p>Troubleshooting scenarios posed by teacher.</p> <p>Evaluating the quality of the stitching on others' work.</p>	

	<p>Knowing that the design criteria help when thinking of ideas.</p> <p>Using labels to explain parts of a design, label materials, etc.</p> <p>Integrating moving parts when creating mock-ups.</p> <p>Knowing that drawings can help explain how something works.</p> <p>Knowing that a label explains part of a drawing.</p> <p>Choosing materials, ingredients or components from a wider range of materials, ingredients or components.</p> <p>Explaining their choices based on the properties of materials and components.</p> <p>Knowing some properties of materials like hard, soft, flexible, waterproof, strong etc.</p> <p>Following and recalling simple safety instructions.</p> <p>Knowing that some tools are sharp like scissors and knives.</p> <p>Choosing known geometric shapes when making.</p>	<p>Describing appearance, smell and taste.</p> <p>Designing three wrap ideas.</p>	<p>Using peer feedback to modify a final design.</p>	<p>Exploring the features of structures.</p> <p>Comparing the stability of different shapes.</p> <p>Testing the strength of their own structures.</p> <p>Identifying the weakest part of a structure.</p> <p>Evaluating the strength, stiffness and stability of their own structure.</p>	<p>Discussing as a class, the success of their stitching against the success criteria.</p> <p>Identifying aspects of their peers' work that they particularly like and why.</p>	
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	<p>Beginning to shape objects to improve how they work.</p> <p>Knowing the names of some geometric shapes: triangle, pyramid, square, cube, circle, sphere.</p> <p>Considering balance in their finishing, like evenly spaced decoration.</p> <p>Discussing a range of existing products and saying what they like and dislike about them.</p> <p>Evaluating existing products against design criteria.</p> <p>Evaluating their ideas and creations against simple design criteria.</p> <p>Knowing that design criteria help to decide if their product is a success.</p> <p>Suggesting improvements to their peers' designs and products.</p> <p>Knowing that improve means to make something better.</p> <p>Knowing that their suggestions can improve someone else's work.</p>					
Vocabulary	<p>design brief</p> <p>design criteria</p> <p>evaluate</p> <p>frame</p> <p>model</p> <p>opinion</p>	<p>appearance</p> <p>balanced</p> <p>carbohydrates</p> <p>chopping board</p> <p>combination</p>	<p>axle</p> <p>design criteria</p> <p>input</p> <p>linkage</p> <p>mechanical</p> <p>output</p>	<p>design criteria</p> <p>man-made</p> <p>natural</p> <p>properties</p> <p>structure</p>	<p>decorate</p> <p>fabric</p> <p>fabric glue</p> <p>knot</p> <p>needle</p> <p>needle threader</p>	

	rotate survey	cut dairy design design brief diet evaluate feel fruit grate grater ingredients menu oils proteins review scissors smell snip spread spreads table knife taste vegetables	pivot wheel	stable shape model test	running stitch sew template thread	
Year 3	Textiles	Electrical systems	Mechanical systems	Digital world	Cooking and nutrition	Structures
	Cross-stitch and applique Cushions or Egyptian collars	Electric poster	Pneumatic toys	Wearable technology	Eating seasonally	Constructing a castle
Knowledge	To know that appliqué is a way of mending or decorating a textile	To understand that an electrical system is a group of parts (components) that	To understand how pneumatic systems work.	To understand that, in programming, a 'loop' is code that repeats something	That seasonal means foods that grow in a given	To understand that wide and flat based objects are more stable.

	<p>by applying smaller pieces of fabric.</p> <p>To understand that a product's function relies on material choices.</p> <p>To identify and explain some materials and explain their aesthetic and functional properties.</p>	<p>work together to transport electricity around a circuit.</p> <p>To understand common features of an electric product (switch, battery or plug, dials, buttons etc.)</p> <p>To list examples of common electric products (kettle, remote control etc.)</p> <p>To understand that an electric product uses an electrical system to work (function).</p> <p>To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits.</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>again and again until stopped.</p> <p>To know that a micro:bit is a pocket-sized, codeable computer.</p> <p>To know that a simulator is able to replicate the functions of an existing piece of technology.</p> <p>To know what the 'Digital revolution' is and features of some of the products that have evolved as a result.</p> <p>To understand what is meant by 'point of sale display.'</p> <p>To know that CAD stands for 'Computer-aided design'.</p> <p>To know what a focus group is by taking part in one.</p>	<p>season in a given country.</p> <p>Some seasonal foods that grow in the UK and what season they grow in.</p> <p>That eating seasonal foods can have a positive impact on the environment.</p> <p>How to describe the flavour and texture of foods.</p> <p>How to cut and peel safely.</p> <p>That the appearance of food is as important as taste.</p> <p>That similar coloured fruits and vegetables often have similar nutritional benefits.</p>	<p>To understand the importance of strength and stiffness in structures.</p> <p>To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse – and their purpose.</p> <p>To know that a façade is the front of a structure.</p> <p>To understand that a castle needed to be strong and stable to withstand enemy attack.</p>
Skills	Designing and making a template for an Egyptian collar and applying	Carrying out research based on a given topic (e.g. The Romans) to develop	Designing a toy that uses a pneumatic system.	Problem solving by suggesting potential features on a micro:bit and justifying my ideas.	Describing how climate affects where foods grow.	Designing a castle with key features to appeal to a specific person/purpose.

<p>individual design criteria.</p> <p>Following their design criteria to create an Egyptian collar. Selecting and cutting fabrics with ease using fabric scissors.</p> <p>Threading needles with greater independence.</p> <p>Tying knots with greater independence.</p> <p>Sewing cross stitch to decorate or join fabric.</p> <p>Decorating fabric using appliqué, beads (or other embellishments), ribbon and pinking scissors.</p> <p>Evaluating an end product.</p>	<p>a range of initial ideas.</p> <p>Generating a final design for the electric poster with consideration for the client's needs and design criteria.</p> <p>Planning the positioning of the bulb (circuit component) and its purpose.</p> <p>Mounting the poster onto corrugated card to improve its strength and withstand the weight of the circuit on the rear.</p> <p>Measuring and marking materials out using a template or ruler.</p> <p>Fitting an electrical component (bulb).</p> <p>Learning ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge).</p>	<p>Developing design criteria from a design brief.</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>Creating a pneumatic system to create a desired motion.</p> <p>Building secure housing for a pneumatic system.</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</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>Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm.</p> <p>Analysing and evaluating an existing product. Using feedback from peers to improve a design.</p>	<p>Identifying seasonal ingredients from the UK.</p> <p>Tasting seasonal ingredients.</p> <p>Describing the texture and flavour of ingredients.</p> <p>Peeling foods by hand or with a peeler.</p> <p>Cutting ingredients safely.</p> <p>Choosing ingredients based on a design brief.</p> <p>Following the instructions within a recipe.</p> <p>Describing the benefits of seasonal fruits and vegetables and their impact on the environment.</p>	<p>Drawing and labelling a castle design using 2D shapes.</p> <p>Designing and/or decorating a castle tower on CAD software.</p> <p>Constructing a range of 3D geometric shapes using nets.</p> <p>Creating special features for individual designs.</p> <p>Making facades from a range of recycled materials.</p> <p>Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design.</p> <p>Suggesting points for modification of the individual designs.</p>
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		<p>Learning to give and accept constructive criticism on own work and the work of others.</p> <p>Testing the success of initial ideas against the design criteria and justifying opinions.</p> <p>Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs.</p>	<p>cutting, creasing, folding and weaving.</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>			
Vocabulary	<p>asymmetrical appliqué cotton cross-stitch embellish fabric patch pinking polyester running stitch silk symmetrical template thread unique</p>	<p>information design design public design criteria research initial ideas sketch bulb self assessment peer assessment feedback develop final design electrical system electric product circuit circuit component bulb battery crocodile wires</p>	<p>mechanism lever pivot linkage system pneumatic system input output component thumbnail sketch research adapt properties reinforce motion</p>	<p>analogue analyse annotate badge computer-aided design (CAD) control design criteria develop digital digital revolution digital world display electronic electronic products fastening feature feedback form function</p>	<p>complementary country cut design evaluate export fruit grate import ingredients Mediterranean mock-up mountain peel polar seasonal seasons snip taste temperate</p>	<p>2D 3D castle design key features net scoring shape stable stiff strong structure tab</p>

				initiate layers monitor net opinion point of sale product product design program sense simulator smart technology test user	texture tropical vegetable weather	
Year 4	Electrical systems	Mechanical systems	Digital world	Cooking and nutrition	Structures	Textiles
	Torches	Making a slingshot car	Mindful moments timer	Adapting a recipe	Pavilions	Fastenings
Knowledge	<p>Electrical conductors are materials which electricity can pass through.</p> <p>Electrical insulators are materials which electricity cannot pass through.</p> <p>A battery contains stored electricity that can be used to power products.</p> <p>An electrical circuit must be complete for electricity to flow.</p>	<p>To understand that all moving things have kinetic energy.</p> <p>To understand that kinetic energy is the energy that something (object/person) has by being in motion.</p> <p>To know that air resistance is the level of drag on an object as it is forced through the air.</p>	<p>To understand what variables are in programming.</p> <p>To know some of the features of a micro:bit.</p> <p>To know that an algorithm is a set of instructions to be followed by the computer.</p> <p>To know that it is important to check code for errors (bugs).</p>	<p>That the amount of an ingredient in a recipe is known as the 'quantity'.</p> <p>That safety and hygiene are important when cooking.</p> <p>The following cooking techniques: sieving, measuring, mixing/stirring, cutting out and shaping.</p>	<p>To understand what a frame structure is.</p> <p>To know that a 'free-standing' structure is one that 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</p>	<p>To know that a fastening is something that holds two pieces of material together.</p> <p>To know that different fastening types are useful for different purposes.</p> <p>To know that creating a mock-up (prototype) of their design is useful for checking ideas and proportions.</p>

	<p>A switch can be used to complete and break an electrical circuit.</p>	<p>To understand that the shape of a moving object will affect how it moves due to air resistance.</p>	<p>To know that a simulator can be used as a way of checking code works before installing it onto an electronic device.</p> <p>To understand the terms 'ergonomic' and 'aesthetic'.</p> <p>To know that a prototype is a 3D model made out of cheap materials, that allows us to test design ideas and make better decisions about size, shape and materials.</p> <p>To know that an exhibition is a way for companies to showcase products, meet potential new customers and gather feedback from users.</p>	<p>The importance of budgeting while planning ingredients for a recipe.</p> <p>That products often have a target audience.</p>	<p>applied to structures for different effects.</p> <p>To know that aesthetics are how a product looks.</p>	
Skills	<p>Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features</p>	<p>Designing a shape that reduces air resistance.</p> <p>Drawing a net to create a structure from.</p>	<p>Writing design criteria for a programmed timer (micro:bit).</p> <p>Exploring different mindfulness strategies.</p>	<p>Evaluating and comparing a range of products.</p> <p>Following a baking recipe.</p>	<p>Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect.</p>	<p>Writing design criteria for a product, articulating decisions made.</p> <p>Designing a personalised book sleeve.</p>

	<p>of individual design ideas. Making a torch with a working electrical circuit and switch.</p> <p>Using appropriate equipment to cut and attach materials.</p> <p>Assembling a torch according to the design and success criteria.</p> <p>Evaluating electrical products.</p> <p>Testing and evaluating the success of a final product.</p>	<p>Choosing shapes that increase or decrease speed as a result of air resistance.</p> <p>Personalising a design.</p> <p>Measuring, marking, cutting and assembling with increasing accuracy.</p> <p>Making a model based on a chosen design.</p> <p>Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.</p>	<p>Applying the results of research to further inform my design criteria.</p> <p>Developing a prototype case for a mindful moment timer.</p> <p>Using and manipulating shapes and clipart by using computer-aided design (CAD), to produce a logo.</p> <p>Following a list of design requirements.</p> <p>Creating a 3D using modelling materials.</p> <p>Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press.</p> <p>Investigating and analysing a range of timers by identifying and comparing their advantages and disadvantages.</p>	<p>Understanding safety and hygiene rules.</p> <p>Identifying a target audience.</p> <p>Designing a biscuit within a given budget.</p> <p>Suggesting modifications.</p> <p>Adapting a recipe.</p> <p>Conducting market research.</p> <p>Evaluating an adapted recipe.</p>	<p>Building frame structures designed to support weight. Creating a range of different shaped frame structures.</p> <p>Making a variety of free-standing frame structures of different shapes and sizes.</p> <p>Selecting appropriate materials to build a strong structure and for the cladding.</p> <p>Reinforcing corners to strengthen a structure.</p> <p>Creating a design in accordance with a plan.</p> <p>Learning to create different textural effects with materials.</p>	<p>Making and testing a paper template with accuracy and in keeping with the design criteria. Measuring, marking and cutting fabric using a paper template.</p> <p>Selecting a stitch style to join fabric.</p> <p>Sewing neatly using small regular stitches.</p> <p>Incorporating a fastening to a design.</p> <p>Testing and evaluating an end product against the original design criteria.</p>
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			<p>Evaluating a program against points on a design criteria and amending them to include any changes made.</p> <p>Documenting and evaluating a project.</p> <p>Understanding what a logo is and why they are important in the world of design and business.</p> <p>Testing a program for bugs (errors in the code).</p> <p>Finding and fixing bugs (debug) in code.</p> <p>Using an exhibition to gather feedback.</p> <p>Gathering feedback from the user to make suggested improvements to a product.</p>			
Vocabulary	battery bulb buzzer circuit diagram component conductor	chassis energy kinetic mechanism air resistance design	aesthetic block brand brand identity bug	adapt addition appearance budget buttery combine	3D shapes cladding design criteria innovative natural	criteria fabric fastening fix mock-up stitch

	electrical item electricity electronic item insulator series circuit switch target audience test torch wire	structure graphics research model template	computer-aided design (CAD) clipart coding criteria debug design develop disadvantage display ergonomic evaluate exhibition feedback form function join logo loop mindfulness model net program prototype research script sketchpad test timer user variable	comment compare construct cream crunchy cuboid cut design evaluate fold hygiene ingredients layout market research modify multiplication opinion pounds sieve sift target audience taste texture unique wooden spoon	reinforce structure	template
Year 5	Mechanical systems	Digital world	Cooking and nutrition	Structures	Textiles	Electrical systems
	Making a pop-up book	Monitoring devices	Developing a recipe	Bridges	Stuffed toys	Doodlers

<p>Knowledge</p>	<p>To know that mechanisms control movement.</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> <p>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>To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record.</p> <p>To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose.</p> <p>To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met.</p>	<p>That beef comes from cows reared on farms.</p> <p>That recipes can be adapted to suit nutritional needs and dietary requirements. That nutritional information is found on food packaging.</p> <p>That coloured chopping boards can prevent cross-contamination.</p> <p>That food packaging serves many purposes.</p>	<p>To understand some different ways to reinforce structures.</p> <p>To understand how triangles can be used to reinforce bridges.</p> <p>To know that properties are words that describe the form and function of materials.</p> <p>To understand why material selection is important based on their properties.</p> <p>To understand the material (functional and aesthetic) properties of wood.</p>	<p>To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric.</p> <p>To understand that it is easier to finish simpler designs to a high standard.</p> <p>To know that soft toys are often made by creating appendages separately and then attaching them to the main body.</p> <p>To know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely.</p>	<p>To know that, in a series circuit, electricity only flows in one direction.</p> <p>To know when there is a break in a series circuit, all components turn off.</p> <p>To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.</p> <p>To know a motorised product is one which uses a motor to function.</p>
<p>Skills</p>	<p>Designing a pop-up book which uses a mixture of structures and mechanisms.</p> <p>Naming each mechanism, input and output accurately.</p>	<p>Researching (books, internet) for a particular animal's needs.</p> <p>Developing design criteria based on research.</p>	<p>Explaining the farm-to-fork process.</p> <p>Researching existing recipes.</p> <p>Suggesting alternative ingredients.</p>	<p>Designing a stable structure that is able to support weight.</p> <p>Creating a frame structure with focus on triangulation.</p>	<p>Designing a stuffed toy considering the main component shapes required and creating an appropriate template.</p> <p>Considering the proportions of individual components.</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</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>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>Evaluating the work of others and receiving feedback on own work.</p> <p>Suggesting points for improvement.</p>	<p>Generating multiple housing ideas using building bricks.</p> <p>Understanding what a virtual model is and the pros and cons of traditional and CAD modelling.</p> <p>Placing and manoeuvring 3D objects, using CAD.</p> <p>Changing the properties of, or combining one or more, 3D objects using CAD.</p> <p>Understanding the functional and aesthetic properties of plastics.</p> <p>Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature moves out of a specified range.</p> <p>Stating an event or fact from the last 100 years of plastic history.</p>	<p>Analysing nutritional content.</p> <p>Writing an alternative recipe.</p> <p>Understanding cross-contamination.</p> <p>Using preparation skills.</p> <p>Designing a jar label.</p> <p>Making a developed recipe.</p>	<p>Making a range of different shaped beam bridges.</p> <p>Using triangles to create truss bridges that span a given distance and support a load.</p> <p>Building a wooden bridge structure.</p> <p>Independently measuring and marking wood accurately.</p> <p>Selecting appropriate tools and equipment for particular tasks.</p> <p>Using the correct techniques to saw safely.</p> <p>Identifying where a structure needs reinforcement and using card corners for support.</p> <p>Explaining why selecting appropriate materials is an</p>	<p>Creating a 3D stuffed toy from a 2D design.</p> <p>Measuring, marking and cutting fabric accurately and independently.</p> <p>Creating strong and secure blanket stitches when joining fabric.</p> <p>Threading needles independently.</p> <p>Using appliqué to attach pieces of fabric decoration.</p> <p>Sewing blanket stitch to join fabric.</p> <p>Applying blanket stitch so the spaces between the stitches are even and regular.</p> <p>Testing and evaluating an end product and giving points for further improvements.</p>	<p>findings from investigating existing products.</p> <p>Developing design criteria that clarifies the target user.</p> <p>Altering a product's form and function by tinkering with its configuration.</p> <p>Making a functional series circuit, incorporating a motor.</p> <p>Constructing a product with consideration for the design criteria.</p> <p>Breaking down the construction process into steps so that others can make the product.</p> <p>Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses.</p> <p>Determining which parts of a product affect its function and</p>
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Vocabulary	<p>design input motion mechanism criteria research reinforce model</p>	<p>monitoring device electronic sensor thermoscope thermometer research design brief design criteria development inventor vivarium programming loop programming comment alert ambient</p>	<p>beef brand cook cross-contamination cut design enhance equipment evaluate farm grate hygiene ingredients label measure nutrient</p>	<p>beam bridge arch bridge truss bridge strength technique corrugation lamination stiffness rigid factors stability visual appeal aesthetics joints</p>	<p>accurate annotate appendage blanket-stitch design criteria detail evaluation fabric sew shape stuffed toy stuffing template</p>	<p>circuit component configuration current develop DIY investigate motor motorised problem solve product analysis series circuit stable target user</p>

		boolean duplicate copy value variable model sustainability plastic microplastics decompose plastic pollution man-made synthetic molecules reformed moulded transparent opaque versatile lightweight strong water-resistant durable 3D models consumables CAD shape properties Tinkercad workplane group ungroup	nutrition nutritional value preference press process recipe safety theme	mark out hardwood softwood wood file/rasp sandpaper/glasspaper bench hook/vice tenon saw/coping saw assemble material properties reinforce wood sourcing evaluate quality of finish accuracy		
Year 6	Digital world	Cooking and nutrition	Structures	Textiles	Electrical systems	Mechanical systems
	Navigating the world	Come dine with me	Playgrounds	Waistcoats	Steady hand game	Automata toys
Knowledge	To know that accelerometers can detect movement.	That 'flavour' is how a food or drink tastes.	To know that structures can be strengthened by	To understand that it is important to design clothing with the	To know that 'form' means the shape	Technical knowledge: Mechanical systems

	<p>To understand that sensors can be useful in products as they mean the product can function without human input.</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> <p>To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.</p>	<p>That many countries have 'national dishes' which are recipes associated with that country.</p> <p>That 'processed food' means food that has been put through multiple changes in a factory.</p> <p>That it is important to wash fruit and vegetables before eating to remove any dirt and insecticides.</p> <p>What happens to a certain food before it appears on the supermarket shelf (farm to fork).</p>	<p>manipulating materials and shapes.</p> <p>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>client/target customer in mind.</p> <p>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>	<p>and appearance of an object.</p> <p>To know the difference between 'form' and 'function'.</p> <p>To understand that 'fit for purpose' means that a product works how it should and is easy to use.</p> <p>To know that 'form over purpose' means that a product looks good but does not work very well.</p> <p>To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind.</p> <p>To understand the diagram perspectives 'top view', 'side view' and 'back'.</p>	<p>To know: Which mechanisms are working together to make a mechanical system.</p> <p>That there are different directions of movement.</p> <p>That mechanisms can change one type of movement to another.</p>
Skills	<p>Writing a design brief from information submitted by a client.</p> <p>Developing design criteria to fulfil the client's request.</p>	<p>Writing a recipe, explaining the key steps, method and ingredients.</p>	<p>Designing a playground featuring a variety of different structures, giving consideration to how</p>	<p>Designing a waistcoat in accordance with a specification and design criteria to fit a specific theme.</p>	<p>Designing a steady hand game, identifying and naming the components required.</p>	<p>Noticing wider-reaching problems or needs in the community.</p> <p>Coming up with a broader range of</p>

<p>Developing a product idea through annotated sketches.</p> <p>Placing and manoeuvring 3D objects, using CAD.</p> <p>Changing the properties of, or combine one or more 3D objects, using CAD.</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>Programming an N,E, S,W cardinal compass.</p> <p>Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool.</p>	<p>Including facts and drawings from research undertaken.</p> <p>Following a recipe, including using the correct quantities of each ingredient.</p> <p>Adapting a recipe based on research.</p> <p>Working to a given timescale.</p> <p>Working safely and hygienically with independence.</p> <p>Evaluating a recipe, considering: taste, smell, texture and origin of the food group.</p> <p>Taste testing and scoring final products.</p> <p>Suggesting and writing up points of improvements in productions.</p> <p>Evaluating health and safety in production to minimise cross contamination.</p>	<p>the structures will be used.</p> <p>Considering effective and ineffective designs.</p> <p>Building a range of play apparatus structures drawing upon new and prior knowledge of structures.</p> <p>Measuring, marking and cutting wood to create a range of structures.</p> <p>Using a range of materials to reinforce and add decoration to structures.</p> <p>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>Annotating designs.</p> <p>Using a template when pinning panels onto fabric.</p> <p>Marking and cutting fabric accurately, in accordance with a 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 objects using thread and adding a secure fastening.</p> <p>Learning different decorative stitches.</p> <p>Sewing accurately with even regularity of stitches.</p> <p>Evaluating work continually as it is created.</p>	<p>Drawing a design from three different perspectives.</p> <p>Generating ideas through sketching and discussion.</p> <p>Modelling ideas through prototypes.</p> <p>Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.</p> <p>Constructing a stable base for a game.</p> <p>Accurately cutting, folding and assembling a net.</p> <p>Decorating the base of the game to a high-quality finish.</p> <p>Making and testing a circuit.</p> <p>Incorporating a circuit into a base.</p> <p>Testing their own and others' finished games, identifying what went well and</p>	<p>ideas and deeper innovation, requiring pupils to think critically about their ideas' practicality and originality.</p> <p>Beginning to use more complex annotated sketches, such as cross-sectional and exploded diagrams and pattern pieces in design.</p> <p>Producing lists of equipment, materials and tools that they need for a task.</p> <p>Selecting materials, components or ingredients based on research or user needs.</p> <p>Explaining their choices, referring to their research.</p> <p>Considering which equipment will work well together.</p> <p>Choosing from the known range of equipment available to them with little guidance.</p>
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	<p>Developing an awareness of sustainable design.</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.</p>				<p>making suggestions for improvement.</p> <p>Gathering images and information about existing children's toys.</p> <p>Analysing a selection of existing children's toys.</p>	<p>Assessing risks associated with different tools and equipment.</p> <p>Understanding and explaining the importance of each safety rule.</p> <p>Consistently apply safety instructions.</p> <p>Cutting jelutong or other harder wood with a coping saw or a tenon saw in small groups.</p> <p>Cutting in a back-and-forth sawing motion where appropriate.</p> <p>In supervised groups, using hot glue guns safely.</p> <p>Recognising that hot glue is useful for joining materials that need a strong bond that sets quickly.</p> <p>Assessing their designs against a more complex set of design criteria that includes functionality,</p>
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						<p>aesthetics, user experience, sustainability and cost.</p> <p>Providing feedback that is helpful, specific and encouraging.</p> <p>Incorporating feedback from peers or users to improve their product further, explaining the changes they made and the impact they had.</p>
Vocabulary	<p>smart smartphone equipment navigation cardinal compass application (apps) pedometer GPS tracker design brief design criteria client function program duplicate replica loop variable value if statement boolean corrode</p>	<p>balance bitter bridge method complement cookbook cross-contamination enhance equipment farm to fork flavours ingredients method research pairing recipe preparation salty sour storyboard sweet umami</p>	<p>apparatus design criteria equipment playground landscape features cladding</p>	<p>annotate decorate design criteria fabric target customer waistcoat waterproof</p>	<p>assemble battery battery pack benefit bulb bulb holder buzzer circuit circuit symbol component conductor copper design design criteria evaluation fine motor skills fit for purpose form function gross motor skills insulator</p>	<p>accurate automata axle bench hook cam cam profile component cross-sectional diagram diagram dowel evaluate exploded diagram follower form frame function housing mechanism storefront visual</p>

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