



Design Technology Progression of Skills and Knowledge - Structures

		Design Technology Progression of Skills and Knowledge - Structures			
		Early Years	Year Two	Year Four	Year Six
			Baby Bear's Chair	Pavilions (Olympics)	Playground
Skills	Design	Encourage children to think about and discuss what they want to make.	Generating and communicating ideas using sketching and modelling. Learning about different types of structures, found in the natural world and in everyday objects.	Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. Building frame structures designed to support weight.	Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.
	Make	Create collaboratively, sharing ideas, resources and skills. Provide opportunities to work together to develop and realise creative ideas. Provide children with a range of materials for children to construct with. Provide a range of materials and tools and teach children to use them with care and precision. Promote independence, taking care not to intro-	Making a structure according to design criteria. Creating joints and structures from paper/card and tape. Building a strong and stiff structure by folding paper.	Creating a range of different shaped frame structures. Making a variety of free standing frame structures of different shapes and sizes. Selecting appropriate materials to build a strong structure and cladding. Reinforcing corners to strengthen a structure. Creating a design in accordance with a plan. Learning to create different textural effects with materials.	Building a range of play apparatus structures drawing upon new and prior knowledge of structures. Measuring, marking and cutting wood to create a range of structures. Using a range of materials to reinforce and add decoration to structures.
	Evaluate	Discuss problems and how they might be solved as they arise. Reflect with children on how they have achieved their aims.	Exploring the features of structures. Comparing the stability of different shapes. Testing the strength of own structures. Identifying the weakest part of a structure. Evaluating the strength, stiffness and stability of own structure.	Evaluating structures made by the class. Describing what characteristics of a design and construction made it the most effective. Considering effective and ineffective designs.	Improving a design plan based on peer evaluation. Testing and adapting a design to improve it as it is developed. Identifying what makes a successful structure.
Knowledge	Technical	Teach children different techniques for joining materials, such as how to use adhesive tape and different sorts of glue.	To know that shapes and structures with wide, flat bases or legs are the most stable. To understand that the shape of a structure affects its strength. To know that materials can be manipulated to improve strength and stiffness. To know that a structure is something which has been formed or made from parts. To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. To know that a 'strong' structure is one which does not break easily. To know that a 'stiff' structure or material is one which does not bend easily.	To understand what a frame structure is. To know that a 'free-standing' structure is one which can stand on its own	To know that structures can be strengthened by manipulating materials and shapes.
	Additional	Introduce the work of artists, craftspeople and designers from different times and cultures.	To know that natural structures are those found in nature. To know that man-made structures are those made by people.	To know that a pavilion is a decorative building or structure for leisure activities. To know that cladding can be applied to structures for different effects. To know that aesthetics are how a product looks. To know that a product's function means its purpose. To understand that the target audience means the person or group of people a product is designed for. To know that architects consider light, shadow and patterns when designing.	To understand what a 'footprint plan' is. To understand that in the real world, design , can impact users in positive and negative ways. To know that a prototype is a cheap model to test a design idea.



Design Technology Progression of Skills and Knowledge - Mechanisms & Mechanical Systems

		Design Technology Progression of Skills and Knowledge - Mechanisms & Mechanical Systems			
		Year One	Year Two	Year Three	Year Five
		Moving Storybooks	Wheels and Axles	Monster Box	Pop-Up Books
Skills	Design	Explaining how to adapt mechanisms, using bridges or guides to control the movement. Designing a moving story book for a given audience.	Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move. Creating clearly labelled drawings that illustrate movement.	Designing a toy which uses a pneumatic system. Developing design criteria from a design brief. Generating ideas using thumbnail sketches and exploded diagrams. Learning that different types of drawings are used in design to explain ideas clearly.	Designing a pop-up book which uses a mixture of structures and mechanisms. Naming each mechanism, input and output accurately. Storyboarding ideas for a book.
	Make	Following a design to create moving models that use levers and sliders.	Adapting mechanisms, when: They do not work as they should. To fit their vehicle design. To improve how they work after testing their vehicle.	Creating a pneumatic system to create a desired motion. Building secure housing for a pneumatic system. Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy. Selecting materials due to their functional and aesthetic characteristics. Manipulating materials to create different effects by cutting, creasing, folding and weaving	Following a design brief to make a pop up book, neatly and with focus on accuracy. Making mechanisms and/or structures using sliders, pivots and folds to produce movement. Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.
	Evaluate	Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed. Reviewing the success of a product by testing it with its intended audience.	Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move.	Using the views of others to improve designs. Testing and modifying the outcome, suggesting improvements. Understanding the purpose of exploded-diagrams through the eyes of a designer and their client.	Evaluating the work of others and receiving feedback on own work. Suggesting points for improvement.
Knowledge	Technical	To know that a mechanism is the parts of an object that move together. To know that a slider mechanism moves an object from side to side. To know that a slider mechanism has a slider, slots, guides and an object. To know that bridges and guides are bits of card that purposefully restrict the movement of the slider.	To know that wheels need to be round to rotate and move. To understand that for a wheel to move it must be attached to a rotating axle. To know that an axle moves within an axle holder which is fixed to the vehicle or toy. To know that the frame of a vehicle (chassis) needs to be balanced	To understand how pneumatic systems work. To understand that pneumatic systems can be used as part of a mechanism. To know that pneumatic systems operate by drawing in, releasing and compressing air.	To know that mechanisms control movement. To understand that mechanisms can be used to change one kind of motion into another. To understand how to use sliders, pivots and folds to create paper-based mechanisms.
	Additional	To know that in Design and technology we call a plan a 'design'.	To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles.	To understand how sketches, drawings and diagrams can be used to communicate design ideas. To know that exploded-diagrams are used to show how different parts of a product fit together. To know that thumbnail sketches are small drawings to get ideas down on paper quickly.	To know that a design brief is a description of what I am going to design and make. To know that designers often want to hide mechanisms to make a product more aesthetically pleasing



Design Technology Progression of Skills and Knowledge - Cooking & Nutrition

		Early Years	Year One	Year Two	Year Three	Year Four	Year Five	Year Six
			Fruit & Vegetables	A Balanced Diet	Eating Seasonally	Adapting a Recipe	What Could be Healthier?	Come Dine with Me
Skills	Design		Designing smoothie carton packaging by-hand or on ICT software.	Designing a healthy wrap based on a food combination which work well together.	Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.	Designing a biscuit within a given budget, drawing upon previous taste testing judgements.	Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. Writing an amended method for a recipe to incorporate the relevant changes to ingredients. Designing appealing packaging to reflect a recipe.	Writing a recipe, explaining the key steps, method and ingredients. Including facts and drawings from research undertaken
	Make		Chopping fruit and vegetables safely to make a smoothie.	Slicing food safely using the bridge or claw grip. Constructing a wrap that meets a design brief.	Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination. Following the instructions within a recipe	Following a baking recipe, from start to finish, including the preparation of ingredients. Cooking safely, following basic hygiene rules. Adapting a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet).	Cutting and preparing vegetables safely. Using equipment safely, including knives, hot pans and hobs. Knowing how to avoid cross-contamination. Following a step by step method carefully to make a recipe.	Following a recipe, including using the correct quantities of each ingredient. Adapting a recipe based on research. Working to a given timescale. Working safely and hygienically with independence
	Evaluate		Tasting and evaluating different food combinations. Describing appearance, smell and taste. Suggesting information to be included on packaging.	Describing the taste, texture and smell of fruit and vegetables. Taste testing food combinations and final products. Describing the information that should be included on a label. Evaluating which grip was most effective.	Establishing and using design criteria to help test and review dishes. Describing the benefits of seasonal fruits and vegetables and the impact on the environment. Suggesting points for improvement when making a seasonal tart.	Evaluating a recipe, considering: taste, smell, texture and appearance. Describing the impact of the budget on the selection of ingredients. Evaluating and comparing a range of food products. Suggesting modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins).	Identifying the nutritional differences between different products and recipes. Identifying and describing healthy benefits of food groups.	Evaluating a recipe, considering: taste, smell, texture and origin of the food group. Taste testing and scoring final products. Suggesting and writing up points of improvements when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process. Evaluating health and safety in production to
Knowledge	Technical		Understanding the difference between fruits and vegetables. To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber). To know that a blender is a machine which mixes ingredients together into a smooth liquid. To know that a fruit has seeds and a vegetable does not. To know that fruits grow on trees or vines. To know that vegetables can grow either above or below ground. To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).	To know that 'diet' means the food and drink that a person or animal usually eats. To understand what makes a balanced diet. To know where to find the nutritional information on packaging. To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. To know that nutrients are substances in food that all living things need to make energy, grow and develop. To know that 'ingredients' means the items in a mixture or recipe. To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy. To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.	To know that not all fruits and vegetables can be grown in the UK. To know that climate affects food growth. To know that vegetables and fruit grow in certain seasons. To know that cooking instructions are known as a 'recipe'. To know that imported food is food which has been brought into the country. To know that exported food is food which has been sent to another country. To understand that imported foods travel from far away and this can negatively impact the environment. To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre. To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health. To know safety rules for using, storing and cleaning a knife safely. To know that similar coloured fruits and vegetables often have similar nutritional benefits	To know that the amount of an ingredient in a recipe is known as the 'quantity.' To know that it is important to use oven gloves when removing hot food from an oven. To know the following cooking techniques: sieving, creaming, rubbing method, cooling. To understand the importance of budgeting while planning ingredients for biscuits.	To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues. To know that I can adapt a recipe to make it healthier by substituting ingredients. To know that I can use a nutritional calculator to see how healthy a food option is. To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.	To know that 'flavour' is how a food or drink tastes. To know that many countries have 'national dishes' which are recipes associated with that country. To know that 'processed food' means food that has been put through multiple changes in a factory. To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork)



Design Technology Progression of Skills and Knowledge - Electrical Systems

Year Four

Year Six

Torches

Steady Hand Game

Skills

Design

Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas

Designing a steady hand game - identifying and naming the components required.
 Drawing a design from three different perspectives.
 Generating ideas through sketching and discussion.
 Modelling ideas through prototypes.
 Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'

Make

Making a torch with a working electrical circuit and switch.
 Using appropriate equipment to cut and attach materials.
 Assembling a torch according to the design and success criteria.

Constructing a stable base for a game.
 Accurately cutting, folding and assembling a net.
 Decorating the base of the game to a high quality finish.
 Making and testing a circuit.
 Incorporating a circuit into a base.

Evaluate

Evaluating electrical products.
 Testing and evaluating the success of a final product.

Testing own and others finished games, identifying what went well and making suggestions for improvement.
 Gathering images and information about existing children's toys.
 Analysing a selection of existing children's toys.

Knowledge

Technical

To understand that electrical conductors are materials which electricity can pass through.
 To understand that electrical insulators are materials which electricity cannot pass through.
 To know that a battery contains stored electricity that can be used to power products.
 To know that an electrical circuit must be complete for electricity to flow.
 To know that a switch can be used to complete and break an electrical circuit.

To know that batteries contain acid, which can be dangerous if they leak.
 To know the names of the components in a basic series circuit, including a buzzer.

Additional

To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens.
 To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan, Thomas Edison and Lewis Latimer.

To know that 'form' means the shape and appearance of an object.
 To know the difference between 'form' and 'function'.
 To understand that 'fit for purpose' means that a product works how it should and is easy to use.
 To know that form over purpose means that a product looks good but does not work very well.
 To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind.
 To understand the diagram perspectives 'top view', 'side view' and 'back'



Design Technology Progression of Skills and Knowledge - Digital World

Year Five

Year Six

Monitoring Devices

Navigating the World

Skills

Design

Researching (books, internet) for a particular (user's) animal's needs.
 Developing design criteria based on research.
 Generating multiple housing ideas using building bricks.
 Understanding what a virtual model is and the pros and cons of traditional and CAD modelling.
 Placing and maneuvering 3D objects, using CAD.
 Changing the properties of, or combining one or more 3D objects, using CAD

Writing a design brief from information submitted by a client.
 Developing design criteria to fulfil the client's request.
 Considering and suggesting additional functions for my navigation tool.
 Developing a product idea through annotated sketches.
 Placing and maneuvering 3D objects, using CAD.
 Changing the properties of, or combining one or more 3D objects, using CAD.

Make

Understanding the functional and aesthetic properties of plastics.
 Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range

Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo).
 Explaining material choices and why they were chosen as part of a product concept.
 Programming an N,E, S, W cardinal compass.

Evaluate

Stating an event or fact from the last 100 years of plastic history.
 Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices.
 Explaining key functions in my program (audible alert, visuals).
 Explaining how my product would be useful for an animal carer including programmed features.

Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool.
 Developing an awareness of sustainable design.
 Identifying key industries that utilise 3D CAD modelling and explaining why.
 Describing how the product concept fits the client's request and how it will benefit the customers.
 Explaining the key functions in my program, including any additions.
 Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool.
 Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch.

Knowledge

Technical

To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record.
 To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose.
 To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met.

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

Additional

To understand key developments in thermometer history.
 To 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.
 To know the 6Rs of sustainability.
 To understand what a virtual model is and the pros and cons of traditional vs CAD modelling.

To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request.
 To know that 'multifunctional' means an object or product has more than one function.
 To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.



Design Technology Progression of Skills and Knowledge - Textiles

		Design Technology Progression of Skills and Knowledge - Textiles			
		Early Years	Year One	Year Three	Year Five
			Puppets	Egyptian Collars	Tudor Waistcoat/Tunic
Skills	Design	Encourage children to think about and discuss what they want to make.	Using a template to create a design for a puppet.	Designing and making a template from an existing cushion and applying individual design criteria.	Designing a waistcoat in accordance to a specification linked to set of design criteria. Annotating designs, to explain their decisions.
	Make	<p>Create collaboratively, sharing ideas, resources and skills.</p> <p>Provide opportunities to work together to develop and realise creative ideas. Provide children with a range of materials for children to construct with.</p> <p>Provide a range of materials and tools and teach children to use them with care and precision.</p> <p>Promote independence, taking care not to introduce too many new things at once.</p>	<p>Cutting fabric neatly with scissors.</p> <p>Using joining methods to decorate a puppet.</p> <p>Sequencing steps for construction.</p>	<p>Following design criteria to create an Egyptian collar.</p> <p>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 join fabric.</p> <p>Decorating fabric using appliqué.</p> <p>Completing design ideas by embellishing the collars based on design ideas</p>	<p>Using a template when cutting fabric to ensure they achieve the correct shape.</p> <p>Using pins effectively to secure a template to fabric without creases or bulges.</p> <p>Marking and cutting fabric accurately, in accordance with their design.</p> <p>Sewing a strong running stitch, making small, neat stitches and following the edge.</p> <p>Tying strong knots.</p> <p>Decorating a waistcoat, attaching features (such as appliqué) using thread.</p> <p>Finishing the waistcoat with a secure fastening (such as buttons).</p> <p>Learning different decorative stitches.</p> <p>Sewing accurately with evenly spaced, neat stitches.</p>
	Evaluate	Discuss problems and how they might be solved as they arise. Reflect with children on how they have achieved their aims.	Reflecting on a finished product, explaining likes and dislikes.	Evaluating an end product and thinking of other ways in which to create similar items.	Reflecting on their work continually throughout the design, make and evaluate process.
Knowledge	Technical	Teach children different techniques for joining materials, such as how to use adhesive tape and different sorts of glue.	<p>To know that 'joining technique' means connecting two pieces of material together.</p> <p>To know that there are various temporary methods of joining fabric by 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 applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces.</p> <p>To know that when two edges of fabric have been joined together it is called a seam.</p> <p>To know that it is important to leave space on the fabric for the seam.</p> <p>To understand that some products are turned inside out after sewing so the stitching is hidden.</p>	<p>To understand that it is important to design clothing with the 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>
	Additional	Introduce the work of artists, craftspeople and designers from different times and cultures.			