

Design and Technology Progression of Knowledge and Skills

Nursery - Explore different materials freely, to develop their ideas about how to use them and what to make - Develop their own ideas and then decide which materials to use to express them - Join different materials and explore different textures - Create closed shapes with continuous lines and begin to use these shapes to represent objects - Use a range of small tools, including scissors, paint brushes			Reception Return to and build on their previous learning, refining ideas and developing their ability to represent them			Early Learning Goals Expressive Arts and Design - Creating with Materials - Safely use and explore a variety of materials, tools and techniques - experiment with colour, design, texture, form and function - Share their creations, explaining the process they have used
Opportunities and activities			Opportunities and activities			
Autumn Making firework rockets-junk modelling Making comfortable bed for bears, etc.	Spring Making a forest, animal houses Junk modelling the Three Little Pigs’ houses/comfortable bed/chair for the bears, making pig/bear puppets	Summer Creating underwater small world/sensory tray, e.g. butterfly garden, frog pond	Autumn Collaborative rocket building using big cardboard boxes, big wooden blocks and other materials	Spring Building dens for woodland animals, bug hotels, obstacle courses for the Snail Collaborative den building Building castles using big blocks/cardboard boxes	Summer Collaborative building of pirate ships using big wooden blocks and other materials	
Structures						
	Year 1 Windmill	Year 2 Chair	Year 3 Castle	Year 4 Pavilion	Year 6 Playground	
Design	Listen to simple design criteria and recall the points	Design a purposeful product based on design criteria	Include key features in a design to appeal to a specific person/purpose Draw features in a castle design using 2D shapes and label the 3D shapes that will create them / materials needed	Design a stable pavilion structure that is aesthetically pleasing and select materials to create a desired effect Build frame structures designed to support weight	Design a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs	
Make	Follow instructions to make a simple structure that is stable Beginning to turn 2D nets into a 3D structure Explore and use an axle in a product	Create joints and structures from paper or card and tape Build a strong and stiff structure by folding paper	Construct a range of 3D geometric shapes using nets Make facades from a range of recycled materials	Make a range of free standing frame structures of different shapes and sizes Select appropriate materials to build a strong structure and reinforce corners to strengthen it Create a design in accordance with a plan	Build a range of play apparatus structures drawing upon new and prior knowledge of structures Measure, mark and cut wood to create a range of structures Use a range of materials to reinforce and add decoration to structures	
Evaluate	Evaluate product against design criteria	Explore the features of structures and compare the stability of different shapes Identify the weakest part of a structure Test and evaluate the strength, stiffness and stability of own structure	Evaluate own work and the work of others based on the aesthetic of the finished product and in comparison to the original design Suggest points for modification of the individual designs	Evaluate structures made by peers Describe what characteristics of a design and construction made it the most effective Consider effective and ineffective designs	Make improvements to a design plan based on evaluation of peers Test and adapt a design to improve it as it is developed Identify what makes a successful structure	
	Explore and use an axle in a product so that a part turns	Know that structures with wide, flat bases or legs are most stable and the shape of a structure affects its strength	Understand that wide and flat based objects are more stable	Understand what a frame structure is	know that structures can be strengthened by manipulating materials and shapes	

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Technical knowledge	Explore how to make a structure more stable by changing the shape	Know materials can be manipulated to improve strength/stiffness Know that what ‘stable’, ‘strong’ ad ‘stiff’ structures are	Understand the importance of strength and stiffness in structures	Know that a ‘free-standing’ structure is one which can stand on its own	
Vocabulary	axle, bridge, design, design criteria, model, net, packaging, structure, template, unstable, stable, strong, weak	design criteria, man-made, natural, properties, structure, stable, shape, model, test	2D, 3D, castle, design, key features, net, scoring, shape, stable, stiff, strong, structure	3D shapes, design criteria, natural, cladding, innovative, reinforce, structure	apparatus, design criteria, equipment, playground, landscape features, cladding
Mechanisms and Mechanical Systems					
	KS1: Year 2 Moving Monster and Fairground Wheel		LKS2: Year 4 Slingshot Car	UKS2: Year 5 Pop-up Book	
Design	Moving Monster Create design criteria as a class Design a moving monster for a specific audience that meets design criteria	Fairground Wheel Select a suitable linkage system to produce a desired motion Design a wheel	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 Personalise a design	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	
Make	Make linkages using card for levers and split pins for pivots Experiment with linkages by adjusting the widths, lengths and thicknesses Cut/assemble parts neatly	Select materials according to characteristics Follow a design brief	Measure, mark, cut and assemble with increasing accuracy Make a model based on a chosen design	Follow a design brief to make a pop-up book, focusing on accuracy Make mechanisms and/or structures to produce movement (sliders, pivots and folds) Create an aesthetically pleasing result by hiding mechanical parts with layers or spacers	
Evaluate	Evaluate own design against design criteria Use peer feedback to modify a final design	Evaluate different designs Test and adapt a design	Evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance	Evaluate the work of others and receive feedback on own work Suggest points for improvement on own work and that of others	
Technical knowledge	Use knowledge of materials’ properties when selecting to make design	Know that mechanisms are moving parts that work together to produce movement Know that there is always an input and output in a mechanism Know a lever turns on a pivot Know that a linkage mechanism is made up of a series of levers	Understand that all moving things have kinetic energy and that kinetic energy is the energy that an object or person has by being in motion Know that air resistance is the level of drag on an object as it is forced through the air. Understand that the shape of a moving object will affect how it moves due to air resistance	Know that mechanisms control movement and can be used to change one kind of motion into another Understand how to use sliders, pivots and folds to create paper-based mechanisms	
Vocabulary	axle, design criteria, input, linkage, mechanical, output, pivot, wheel	design, design criteria, wheel, Ferris wheel, pods, axle, axle holder, frame, mechanism	chassis, energy, kinetic, mechanism, air resistance, design, structure, graphics, research, model, template	design, input, motion, mechanism, criteria, research, reinforce, model	
Cooking and Nutrition					
	KS1: Year 1		LKS2: Year 3	UKS2: Year 5	

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	Fruit and Vegetable Smoothies		Eating Seasonally	What could be healthier?	
Design	Design smoothie carton packaging		Create a healthy and nutritious recipe for a savoury tart using seasonal ingredients and considering the taste, texture, smell and appearance of the dish	Adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add ingredients Write an amended method for a recipe to incorporate the relevant changes to ingredients Design appealing packaging to reflect a recipe	
	Know the importance of hygiene when preparing food Chop fruit and vegetables safely Identify if a food is a fruit or a vegetable Learn where and how fruits and vegetables grow		Prepare a hygienic work space to cook safely in, learning the basic rules to avoid food contamination Following the instructions within a recipe	Cut and prepare vegetables safely Use equipment safely (e.g. knives, pans and hobs) Know how to avoid cross-contamination Follow a step by step method carefully to make a recipe	
	Taste and evaluate different combinations of fruit and vegetables Describe appearance, smell and taste Suggest information to be included on packaging		Establish and use design criteria to help test and review dishes Describe the benefits of seasonal fruits and vegetables and the impact on the environment Suggest points for improvement when making a seasonal tart	Identify the nutritional differences between different products and recipes Identify and describe healthy benefits of food group	
Knowledge	Know that a fruit has seeds and a vegetable does not Know that some foods typically known as vegetables are actually fruits (e.g. cucumber) Know that fruits grow on trees or vines Know that vegetables can grow either above or below ground, from different parts of the plant, e.g. roots: potatoes, leaves: lettuce Know that fruits and vegetables contain vitamins which are healthy for us		Know that not all fruits and vegetables can be grown in the UK Know that vegetables and fruit grow in certain seasons Know that imported food is food which has been brought into the country and that exported food is food which has been sent to another country Understand that imported foods travel from far away and can negatively impact the environment Know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre Know safety rules for using, storing and cleaning a knife safely	Understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues Know that a recipe can be adapted to make it healthier by substituting ingredients 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	
	Vocabulary		fruit, vegetable, seed, leaf, root, stem, smoothie, healthy, carton, design, flavour, peel, slice	climate, imported, natural, reared, seasonal, diet, ingredients, processed, recipe, seasons, sugar	beef, reared, processed, ethical, diet, ingredients, supermarket, farm, balanced
	Textiles				
	Year 1 Puppets		Year 2 Pouches	Year 5 Soft toys	Year 6 Waistcoats
Design	Use a template to create a design for a puppet		Design a pouch	Design a stuffed toy considering the main component shapes required and creating an appropriate template	Design a waistcoat in accordance to specification and annotate designs, to explain decisions

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Make	Cut fabric with scissors	Cut fabric neatly with scissors	Measure, mark and cut fabric accurately and independently	Draw around a template to mark and cut fabric accurately
	Use joining methods to decorate a puppet	Thread a needle and sew a running stitch	Thread needles independently	Sew a strong running stitch, making small, neat stitches that are evenly spaced and following the edge
			Create strong and secure blanket stitches with even, regular spaces	Tie strong knots
				Finish the waistcoat with a secure fastening, such as buttons
Evaluate	Reflect on a finished product and explain likes and dislikes	Evaluate on consistency of size and space of running stitches in own work and others	Test and evaluate an end product and give points for further improvements	Reflecting continually throughout the design, make and evaluate process
Knowledge	know that there are different temporary methods of joining fabric by using staples, glue or pins	Understand the importance of tying a knot after sewing the final stitch	Know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely	Understand that it is important to design clothing with the client/ target customer in mind
	Understand that a template (or fabric pattern) is used to cut out the same shape multiple times		Know that soft toys are often made by creating appendages separately and then attaching them to the main body	Know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.
Vocabulary	decorate, design, fabric, glue, model, hand puppet, safety pin, staple, stencil, template	decorate, fabric, knot, needle, needle threader, running stitch, sew, template, thread	accurate, annotate, appendage, blanket-stitch, design criteria, detail, evaluation, fabric, sew, shape, stuffed toy, stuffing, template	annotate, decorate, design criteria, fabric, target customer, waistcoat, waterproof
	*In addition: Year 3 – cross stitching lessons			
Electrical Systems (KS2)				
	Year 4 Torches		Year 6 Steady hand game	
Design	Design a torch, giving consideration to the target audience		Gathering and analysing images and information about existing children’s toys Drawing a design from three different perspectives (top view’, ‘side view’ and ‘back’) Generating ideas through sketching and discussion Modelling ideas through prototypes	
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		Accurately cutting, folding and assembling a net Making and testing a circuit	
Evaluate	Test and evaluate the success of a final product		Test own and others’ finished games, identifying what went well and making suggestions for improvement	
Technical Knowledge	Understand that electrical conductors are materials which electricity can pass through and 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 and that a switch can be used to complete and break the circuit		Understanding the purpose of products (toys), including what is meant by ‘fit for purpose’ and ‘form over function’	
Vocabulary	battery, bulb, buzzer, conductor, circuit, circuit diagram, electricity, insulator, series circuit, switch, component, design, design criteria diagram, evaluation, LED, model, shape, target audience, input, recyclable, theme, aesthetics, assemble, equipment, ingredients, packaging, properties		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, user	