Design and Technology Knowledge and Skills Progression

Our goal for Design Technology education is for children to become resourceful, innovative, enterprising and capable citizens, developing their:

- knowledge and skills to design, make and evaluate high-quality prototypes and products;
- knowledge and understanding of newly emerging and rapidly developing technologies; and
- an understanding of nutrition and learning how to cook.

EYFS Framework

Three and Four-Year-Olds	Personal, Social and Emotional Development	 Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen or one which is suggested to them.
	Physical Development	Use large-muscle movements to wave flags and streamers, paint and make marks.
		Choose the right resources to carry out their own plan.
		Use one-handed tools and equipment, for example, making snips in paper with scissors.
	Understanding the World	Explore how things work.
	Expressive Arts and Design	 Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park.
		• Explore different materials freely, in order 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.
		Create closed shapes with continuous lines, and begin to use these shapes to represent objects.
Reception	Physical Development	Progress towards a more fluent style of moving, with developing control and grace.
		Develop their small motor skills so that they can use a range of tools competently sofely and confidently.
		tools competently, safely and confidently.
		 Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.
	Expressive Arts and Design	Explore, use and refine a variety of artistic effects to express their ideas and feelings.

		 Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills.
ELG	Physical Development: Fine Motor Skills	Use a range of small tools, including scissors, paintbrushes and cutlery.
	Expressive Arts and Design: Creating with Materials	 Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the process they have used.

		KS1
Technical Know	vledge	 build structures, exploring how they can be made stronger, stiffer and more stable. explore and use mechanisms, such as levers, sliders, wheels and axles, in their products
Designing		 design purposeful, functional, appealing products for themselves and other users based on design criteria. generate develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.
Making (mastering techniques)	Materials	 Cut materials safely using tools provided. Measure and mark out to the nearest centimetre. Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). Demonstrate a range of joining techniques (such as glueing, hinges or combining materials to strengthen).
Textiles		 Shape textiles using templates. Join textiles using running stitch. Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing).
	Electricals and Electronics	Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage).
	Computing	Model designs using software.
	Construction	Use materials to practise drilling, screwing, glueing and nailing materials to make and strengthen products
	Mechanics	Create products using levers, wheels and winding mechanisms.
	Food Technology	Use the basic principles of a healthy and varied diet to prepare dishes and understand where food comes from.

 Evaluating and communicating evaluate their ideas and products against design criteria. 					
		LKS2			
Technical Knov	/ledge	 apply their understanding of how to strengthen, stiffen and reinforce more complex structures. understand and use mechanical systems in their products, such as gears, pulleys, cams, levers and linkages. 			
Designing		 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. 			
Making (mastering techniques)	Materials	 Cut materials accurately and safely by selecting appropriate tools. Measure and mark out to the nearest millimetre. Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). Select appropriate joining techniques. 			
	Textiles	 Understand the need for a seam allowance. Join textiles with appropriate stitching. Select the most appropriate techniques to decorate textiles. 			
	Electricals and Electronics	Create series and parallel circuits			
	Computing	Control and monitor models using software designed for this purpose.			
	Construction	Choose suitable techniques to construct products or to repair items. Strengthen materials using suitable techniques			
	Mechanics	• Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears).			
	Food Technology	Understand and apply the principles of a healthy and varied diet. Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. Understand seasonality and know where and how a variety of ingredients are grown, rear			
	Evaluating and communicating	 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 			
		UKS2			

Technical Knowledge		 understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs, buzzers and motors. apply their understanding of computing to programme, monitor and control their products. 		
Designing		• use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particula 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.		
Making (mastering techniques)		 Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper). 		
• J		 Create objects (such as a cushion) that employ a seam allowance. Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration). Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles (such as a soft decoration for comfort on a cushion). 		
	Electricals and Electronics	Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips).		
	Computing	Write code to control and monitor models or products.		
Construction		Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).		
 Mechanics Convert rotary motion to linear using cams. Use innovative combinations of electronics (or computing) and 		 Convert rotary motion to linear using cams. Use innovative combinations of electronics (or computing) and mechanics in product design. 		

	DT Subject knowledge/content What technical knowledge, designing and mastering techniques will help them with their project?		Evaluating and communicating How do you want them to show their understanding? outcomes will they produce? What ICT can they use?	
Year 1				

Technical knowledge build structures, exploring how Make Cut materials safely using tools	techniques (such as gluing, hinges or combining materials to	D&T STEM Project Design a dream playground	Children will work in teams to design and build their 'dream playground'. Carefully thinking about planning the materials they will use and thinking about what features to put in each area of the playground.	
Vocabulary What scientific and DT terminology will they need for this learning?	Hard, Soft, Bendy, Rough, Smooth, Elastic, Waterproof Cut, fold, join, fix, structure, wall, tower, weak, thinner, thicke triangle, square, rectangle, cube, cylinder, design, make, evaluate Scissors, shears, felt, cotton, template, pattern pieces, mark of design brief, design criteria, make, evaluate, user, purpose, fu Design, Build, Construct, Material, Structure, Cut, Glue Slider, lever, pivot, slot, bridge/guide, card, masking tape, pag forwards, backwards, design, make, evaluate, user, purpose, in	Cross Curricular Links Science: Links to Materials topic		
Resources What sources and resources are you going to use? What trips/visitors will support learning? What texts can you use to support learning? What ICT can you use?	Bricks / cement? / lego, Straw, Paper straws , Glue, String, Fo	am bricks, Cardboard, Cutting to	ols	

Ye	ear 2		
Designing: design purposeful, functional, appealing products for themselves and other users based on design criteria.	Primary Engineer Shoebox buggy	Children will work in teams to make a shoebox buggy. They will follow instructions on how to make the basic	
Technical knowledge: explore and use mechanisms, such as levers, sliders, wheels and axles, in their products.		design and then be given the option of how to add extra	
Make:		parts to make their vehicle more appealing.	
 Cut materials safely using tools provided. Measure and mark out to the nearest centimetre. Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen). Create products using levers, wheels and winding mechanisms. 		Children can test their buggy on force ramps to see that they travel in a straight line, and how to make them go faster or more slowly.	
Evaluateexplore and evaluate a range of existing products.		One team per class could represent their age category in the primary Engineer Celebration event	
		Pupils could use iPads to stop motion the moving of their vehicles	

Vocabulary What scientific and DT terminology will they need for this learning?	design, function / functional, develop, product, construct, model, material, template, cut, build, structure, components, tools Engineer, Material, Wood, Gears, Axel, opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing. Bend/bending, stretch/stretching	Cross Curricular Links Science: links to materials topic			
Resources What sources and resources are you going to use? What trips/visitors will support learning? What texts can you use to support learning? What ICT can you use?	Shoeboxes, Wheels, Dowling, Saws, Cutting blocks, Decorative card, paper, tissue, Testing ramps				

Year 3

Design: • use research and develop design of innovative, functional fit for purpose, aimed at particular of through discussion, annotated exploded diagrams, prototypest computer-aided design. Technical knowledge: • apply their understanding of reinforce more complex structular of the such as gears, pulleys, cams, less than th	I, appealing products that are ular individuals or groups. Id communicate their ideas sketches, cross-sectional and pattern pieces and Ihow to strengthen, stiffen and ures. Ical systems in their products, wers and linkages. In their products to be transference of forces to be for a product (such as ulleys and gears). In the communication of th	Design and make a shadow puppet with a moving part	Children plan and make a puppet with a moving part Children can perform a puppet show at the end of the session Students can test transparent, opaque and translucent materials when making their puppet	
Vocabulary What scientific and DT terminology will they need for this learning?	Shadow, Torch, Light source, T Design, Plan, Evaluate, Stick, J	Transparent, Opaque, Reflection, Transparent, Translucent, Opa oin, Lever, Material	que,	Cross Curricular Links Science: Links to light topic
Resources What sources and resources are you going to use? What trips/visitors will support learning? What texts can you use to support learning? What ICT can you use?	Card, Wooden sticks, Straws, Torches, Tracing paper, Tape, Cellophane, Drawing pins			

	Year 4				
Design	Primary Engineer Mars Rover	Children work in teams of			
use research and develop design criteria to inform the		3-4 to follow the steps to			
design of innovative, functional, appealing products that are		build a Mars Rover. Children			
fit for purpose, aimed at particular individuals or groups.		can first research and learn about the surface on Mars			
Technical knowledge:		and think about the design			
 understand and use mechanical systems in their products, 		criteria for their buggy.			
such as gears, pulleys, cams, levers and linkages.					
		Children test product and			
• understand and use electrical systems in their products,		one team per class takes			
such as series circuits incorporating switches, bulbs, buzzers and motors.		their design to the Primary Engineer Award Celebration			
and motors.		Event			
Make:					
 select and use a wide range of tools and equipment (for 					
example, cutting, shaping, joining and finishing) accurately					
Select and use a wide range of materials and					
components (construction materials, textiles)					
Evaluate:					
 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					

Vocabulary

What scientific and DT terminology will they need for this learning?

Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol

design, function / functional, develop, product, construct, model, material, template, cut, build, mechanism, incorporate, structure, components, tools, gears

Cross Curricular Links
Science: Link to Electricity
topic

Primary Engineer Packs: Resources Toolboxes with kit for each group of 3 children (See separate planning in Year 4 folder) What sources and resources are you going to use? What trips/visitors will support Wire spinner learning? What texts can you use **Batteries** to support learning? What ICT can you use? Year 5 Make a product that involves Design: Chain Reaction Project a lever, pulley or gear – See • use research and develop design criteria to inform the design of innovative, functional, appealing products that are separate planning in the fit for purpose, aimed at particular individuals or groups. Science folder • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. Technical knowledge: • apply their understanding of how to strengthen, stiffen and reinforce more complex structures.

• understand and use mechanical systems in their products,

such as gears, pulleys, cams, levers and linkages.

Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape).

• Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would

• 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

Make:

Evaluate:

work.

be used to cut paper).

understand how key events a technology have helped shape	_				
Vocabulary What scientific and DT terminology will they need for this learning?	, , , , , , , , , , , , , , , , , , , ,				Cross Curricular Links Science: linked to forces
Resources What sources and resources are you going to use? What trips/visitors will support learning? What texts can you use to support learning? What ICT can you use?	at ort can you use				
		Υє	ear 6		
Design: • 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. Technical knowledge: • apply their understanding of how to strengthen, stiffen and reinforce more complex structures.		Crest Discovery Project: Stop the Spread Linked to microorganisms	Children work as a team to design and build a water sanitation product linking to Global Goals	Children work as a team to design and build a water sanitation product linking to Global Goals	
understand and use mechani levers and linkages.	• understand and use mechanical systems in their products, such as gears, pulleys, cams, levers and linkages.				
Make: Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape).					

• Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).				
Evaluate: • investigate and analyse a range	e 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				
Vocabulary What scientific and DT terminology will they need for this learning?	design, function / functional, develop,product, construct, model, material, template, cut, build, mechanism, incorporate, Mic			Cross Curricular Links Science: Links to Micro-organisms and living things and their habitats
Resources What sources and resources are you going to use? What trips/visitors will support learning? What texts can you use to support learning? What ICT can you use?	Resources outlined in separate planning saved in Science folder			

Food Technology Curriculum Progression

Our goal for Food Technology Education is that children know how to be safe, healthy and emotionally regulated, so they can manage their future lives in a positive way, by developing:

- · understanding of how to look after their physical and mental health and well-being (link with PSHE Curriculum);
- · Understand the principles of nutrition and healthy eating (link with Design and Technology Curriculum); and
- Enjoying exploring, discovering and creating meaningful connections with the world (link with science Curriculum).

Science curriculum

Geography curriculum

PSHE Curriculum (Health Education)

<u>Year</u>	Technical Knowledge	Making (mastering techniques) suggestions/examples	Evaluating and communicating
<u>Nursery</u>		Gingerbread men (link with Reading) Fruit smoothies (Fair Trade Fortnight), flapjacks, vegetable animals etc.	Express food preferences
Reception	Farms including where food come from	Fruit salad/kebabs Cress head	Express food preferences
Year One	Identify and name a variety of common animals that are carnivores, herbivores and omnivores.	Jam sandwich Frozen fruit kebabs	Evaluate their own cooking

Year Two	-find out about and describe the basic needs of animals, including humans, for survival (water, food and air) -describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. What constitutes a healthy diet (including understanding calories and other nutritional content).	Muesli Wraps	Evaluate their own cooking
<u>Year Three</u>	-identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.	Pizza (Pizza Express Skills Builder) Smoothie	Evaluate their own cooking and others'.

Year Four	-describe the simple functions of the basic parts of the digestive system in humans -identify the different types of teeth in humans, their simple functions and how to look after them (Dental Health) The characteristics of a poor diet and risks associated with unhealthy eating (including, for example, obesity and tooth decay The principles of planning and preparing a range of healthy meals. Construct and interpret a variety of food chains, identifying producers, predators and prey.	Ice Cream (As part of Skills Builder with Udderlicious) Salad and hummus pitta	Evaluate their own cooking and others'.
<u>Year</u> <u>Five</u>	-the facts about legal and illegal harmful substances and associated risks, including smoking, alcohol use and drug taking. Risks associated with unhealthy eating and other behaviours (e.g. the impact of alcohol on diet or health).	Biscuits (or bread Skills Builder Belle Epoque) Rainbow layered salad in a jar	Evaluate their own cooking and others'. Consider views of others.

<u>Year</u>	-recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function, including	Dip and dippers (e.g. carrot sticks)	Evaluate their own cooking and others'. Consider the views of others.
<u>Six</u>	their brain (Mental health).		
	human geography, including: settlements, land use,	Sushi/Japanese	
	economic activity including trade links, and the	Wagamamas (Skills	
	distribution of natural resources including energy,	<u>Builder)</u>	
	food, minerals, and water supplies		