

Design and Technology Progression

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Existing Products	<u>Skill</u> Name and explore a range of everyday products and describe how they are used. <u>Core Knowledge</u> • An axel is a rod that is connected to the centre of a wheel, which allows it to turn. • A chassis is the frame of a vehicle. • A shelter is a structure that provides protection from weather or danger.	<u>Skill</u> Explain how an everyday product can be improved. <u>Core Knowledge</u> • There are many home products made from fabric. • Examples of fabric based products in the home include cushions, curtains, blinds and carpets.	<u>Skills</u> Explain how existing products benefits the user. <u>Core Knowledge</u> • Particular products are designed for specific tasks.	<u>Skills</u> Investigate and identify the key features of a familiar product. <u>Core Knowledge</u> • Design features are the aspects of a products design that the designer would like to emphasise. • A switch makes or breaks a circuit. • When a switch is closed or 'on' the circuit is complete. • When a switch is open or 'off' the circuit is incomplete.	<u>Skills</u> Explain of the design of a product has been influenced by the culture or society in which it was designed or made. <u>Core Knowledge</u> • The design of the products need to take into account the culture of the target audience. • The ancient Greeks developed the classical form of architecture that has been copied for thousands of years.	<u>Skills</u> Analyse how an invention or product has significantly changed or improved people's lives. <u>Core Knowledge</u> • The Make Do and Mend campaign was run by the Ministry of Information during the Second World War to encourage people to recycle and repurpose their old clothes rather than buy new. • Make Do and Mend campaigns aimed to limit the amount of labour and materials used in clothes production, so that it could be

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						used to support the war effort. • A processed food is changed during preparation and includes processes, such as cooking, freezing, pasteurising, or the addition of ingredients. • Processed foods can be convenient and increase availability, but often lack nutrients and contain unhealthy ingredients when compared to whole foods. • Sliced bread is processed. It can contain many more ingredients than home made bread including preservatives
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						and artificial ingredients. • Bridge structures have changed over time. This is due to factors such as technology, design innovation, new and better access to materials.
Health and Safety	<u>Skills</u> Follow the rules to keep safe during a practical task. <u>Core Knowledge</u> • Rules are made to keep people safe from danger. • Safety rules include always listening carefully, following instructions and only using equipment when told to do so.	<u>Skills</u> Work safely and hygienically in construction and cooking activities. <u>Core Knowledge</u> • Hygiene rules include washing hands before handling food, cleaning surfaces, tying long hair back, storing food appropriately and wiping up spills.	<u>Skills</u> Use appliances safely with adult supervision. <u>Core Knowledge</u> • Safety rules must be followed when using electricity. Fingers and other objects must not be put into electrical outlets. Anything with a cord or plug should not be used near to water. A plug should never	<u>Skills</u> Work safely with everyday chemical products under supervision, such as disinfectant hand wash and surface cleaning spray. <u>Core Knowledge</u> • Chemicals are used in the home every day. They include cleaning products such as bleach, disinfectant but also paint, glues, oils, pesticides and medicines.	<u>Skills</u> Explain the functionality and purpose of safety features on a range of products. <u>Broad Knowledge</u> Safety features are often incorporated into products that might cause harm. Some examples include child safety caps on medicine bottles, seatbelts in cars, covers for electrical sockets and finger guards on doors.	<u>Skills</u> Demonstrate how their products take into account the safety of the user. <u>Core Knowledge</u> • The safety of the user has to be taken into account when designing a new product.

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			be pulled out by it's cord.	Chemicals should only be used under adult supervision.		
Mechanisms and Movement	<u>Skills</u> Use wheels and axels to make a simple moving model. <u>Core Knowledge</u> - Most vehicles that move on land have axels and wheels that are fixed to a chassis. - An axel fixed to a chassis has freely moving wheels. - A freely moving axel has fixed wheels.		<u>Skills</u> Explore and use a range of mechanisms (levers, sliders, axels, wheels and cams) in models or products. <u>Core Knowledge</u> - Cams are devices that can convert circular motion into up and down motion. - The cam is fixed to the axel and the follower sits on the cam. When the axel is rotated, the follower moves up and down, following the shape of the cam. - Different shaped cams produce different patters of	<u>Skill</u> Explore and use a range of mechanisms (levers, axels, cams, gears and pulleys) in models or products. <u>Core Knowledge</u> - Simple machines make physical jobs easier by changing the strength and direction of a force. - There are six simple machines: pulley, leaver, wheel and axel, wedge, incline plane and screw. - Simple machines can be combined to make complex machines. For example a wheelbarrow combines a	<u>Skill</u> Use mechanical systems in their products such as pneumatic systems. <u>Core Knowledge</u> - A pneumatic system used compressed air to exert a force. - Pneumatic systems can be used to lift heavy loads, raise and lower platforms or soften a force by acting as a shock absorber.	

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			movement in the follower.	lever with a wheel axel.		
Electricity	<u>Skills</u> Identify products that use electricity to make them work and describe how to switch them on and off. <u>Broad Knowledge</u> Electricity is a form of energy. Many household appliances use electricity such as kettles, televisions and washing machines. They can be switched on by completing the circuit to allow the flow of electricity or off by breaking the circuit. This can be a switch on the appliance or at the wall socket.			<u>Skills</u> Incorporate circuits that use a variety of components into models or products. <u>Broad Knowledge</u> Components can be added to circuits to achieve a particular goal. These include bulbs for lighthouses or torches, buzzers for burglar alarms, motors for fairground rides and motorised vehicles.		<u>Skills</u> Understand and use electrical circuits that incorporate a variety of components (switches, lamps, buzzers and motors) and use programming and control in their products. <u>Broad Knowledge</u> Computer programmes can control electrical circuits that include a variety of components, such as switches, lamps buzzers and motors.
Generating Ideas (Designing)	<u>Skills</u> Create a design to meet a simple criteria. <u>Core Knowledge</u> A product or project is usually	<u>Skills</u> Generate and communicate ideas through a range of methods. <u>Broad Knowledge</u>	<u>Skill</u> Develop a design criteria to inform a design. <u>Core Knowledge</u> Design criteria are the exact	<u>Skill</u> Use annotated sketches and exploded diagrams to communicate ideas. <u>Core Knowledge</u>	<u>Skill</u> Use computer aided design software to design a product (TinkerCad). <u>Core Knowledge</u>	<u>Skill</u> Develop a design idea for an appealing and functional product that is fit for purpose, communicating ideas clearly in a range of ways.

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	guided by a set of design criteria. The project or product must meet the design criteria to be successful.	Ideas can be communicated in a variety of ways including written, drawn, diagrams, models and speaking and using ICT.	goals a product must achieve to be successful. These criteria might contain a products use, appearance, cost and target user.	Annotated sketches and exploded diagrams show specific parts of a design, highlight sections or show functions. They communicate ideas in a visual way.	Computer Aided Design (CAD) is the use of specialised software to design a product. CAD design can also be made into objects by 3D printing.	<u>Core Knowledge</u> Ideas can be communicated in a range of ways, including through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer aided design.
Structures	<u>Skills</u> Construct simple structures, models or other products using a range of materials. <u>Core Knowledge</u> Different materials can be used for different purposes, depending on their properties.	<u>Skills</u> Explore how structures can be made stronger, stiffer and more stable. <u>Core Knowledge</u> Structures can be made stronger, stiffer and more stable by using cardboard rather than paper and triangular shapes rather than squares.	<u>Skills</u> Create a shell frame structure using diagonal struts to strengthen them. <u>Core Knowledge</u> - Diagonal struts create triangular shapes within frame structures. - Adding diagonal struts to frame structures adds strength and stability.	<u>Skills</u> Prototype shell and frame structures showing awareness how to strengthen, stiffen and reinforce them. <u>Core Knowledge</u> A prototype is a mock up of a design that will look like the finished product but may not be full sized or made of the same materials.	<u>Skills</u> Build a framework using a range of materials. <u>Core Knowledge</u> Support, stiffness and stability can be created by using triangular shapes to create strong frameworks, columns to support roofs, and overlapping	<u>Skills</u> Select the most appropriate materials and frameworks for different structures, explaining what makes them strong. <u>Core Knowledge</u> - Strength can be added to a framework by using multiple layers or changing it's shape. - Triangles do not collapse or distort easily and so are

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					brickwork patterns. • Mechanisms and systems can work together to perform a function. • A strong and stable structure is necessary to support mechanisms in a machine.	used in architecture to provide support and stability.
Use of ICT				<u>Skills</u> Write a programme to control a physical device such as a light, speaker or buzzer. <u>Core Knowledge</u> • Remote control is controlling a machine or activity from a distance. Computers can be used to remotely control a device.	<u>Skill</u> Use computer aided design software to design a product (TinkerCad). <u>Core Knowledge</u> • Computer Aided Design (C AD) is the use of specialised software to design a product. CAD design can also be made into objects by 3D printing.	<u>Skills</u> <u>Use a sensor to</u> monitor an environmental variable such as temperature, sound or light. <u>Core Knowledge</u> • Many devices we see in our homes and elsewhere use programmable sensors that monitor environmental variables such as light, sound and temperature.

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Investigating (Tools and Equipment)	<u>Skills</u> Select the appropriate tool for a simple practical task. <u>Core Knowledge</u> - Some foods need to be prepared before eating. - Peeling, slicing, chopping, mashing, grating or tearing are different methods of preparing foods.	<u>Skills</u> Select the appropriate tool for the task and explain their choice. <u>Core Knowledge</u> Tools have characteristics that make them suitable for specific purposes. For example, a knife is good for cutting food because it has a sharp metal edge.	<u>Skills</u> Use tools safely for cutting and joining components. <u>Broad Knowledge</u> Specific tools can be used for cutting, such as saws. Wood can be joined using glue, nails, staples or a combination of these. Safety rules must be followed to prevent injury from sharp blades. These rules include using a bench hook to keep the wood still, using a junior hacksaw with a pistol grip and working under adult supervision.	<u>Skills</u> Select, name and use tools with adult supervision. <u>Broad Knowledge</u> Useful tools for cutting include scissors, craft knives, junior hacksaws with pistol grip and bench hooks. Tools must only be used under adult supervision and safety rules must be followed.	<u>Skills</u> Name and select increasingly appropriate tools for a task and use them safely. <u>Broad Knowledge</u> There are many rules for using tools safely and these may vary depending on the tools being used. All tools should be cleaned and put away after use and should not be used if they are loose or cracked.	<u>Skills</u> Use appropriate tools for a task, using them safely and precisely. <u>Core Knowledge</u> - Deconstructing garments identifies how they were made, the materials used and their properties. - Hand stitches include the running stitch, blanket stitch and whip stitch.
Evaluation	<u>Skills</u> Talk about their own and each others work identifying strengths and weaknesses and offering support. <u>Core Knowledge</u> A strength is something that is good about a piece of work.	<u>Skills</u> Explain how closely their products meet their design criteria and say what they could do better in the future. <u>Core Knowledge</u> A finished product can be checked	<u>Skills</u> Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account. <u>Core Knowledge</u> Asking questions can	<u>Skills</u> Identify what has worked well and what aspects of their product could be improved acting on their own suggestions and those of others when making improvements. <u>Core Knowledge</u>	<u>Skills</u> Test and evaluate products against a design specification and make adaptations as they develop the product. <u>Core Knowledge</u> Testing the product against the	<u>Skills</u> Demonstrate modifications made to a product as a result of ongoing evaluation by themselves and to others. <u>Core Knowledge</u> An iterative process starts with

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	A weakness is an area that could be improved.	against a design criteria to see how successfully it has been made or to evaluate how well it works. Improvements can then be planned.	help others to evaluate their products.	- Evaluation can be done by considering whether the product does what it was designed to do, whether it has an attractive appearance, what changes were made during the making process and why the changes were made. - The evaluation process can include suggesting improvements and why they should be made.	design criteria will highlight anything that needs improvement or redesigning.	requirements and continues by creating a product, testing it and revising it before creating a better version. The iterative process is a series of steps that are repeated, improving the product with each cycle.
Cutting and joining fabric (Textiles)		<u>Skills</u> Use different methods to join fabrics including glue and the running stitch. <u>Core Knowledge</u> A running stitch is a basic stitch	<u>Skills</u> Cut and join wools, threads and other fabrics to a loom. <u>Core Knowledge</u> Weaving involves using interlacing pieces of thread or yarn	<u>Skills</u> Hand sew a hem or seam using a running stitch. <u>Core Knowledge</u> A hem runs along the edge of a piece of cloth or clothing, it		<u>Skills</u> Pin and tack fabrics in preparation for sewing and more complex pattern work. <u>Broad Knowledge</u> Pinning with dressmaker pins and tacking with quick, temporary stitches

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		used to join fabric.	or other materials. (ART UNIT)	is made by turning under a raw edge and sewing to give a neat, quality finish.		holds fabric together in preparation for and during sewing.
Materials for purpose	<u>Skills</u> Select and use a range of materials, beginning to explain choices. <u>Broad Knowledge</u> Different materials are used for different purposes, depending on their different properties.	<u>Skills</u> Choose appropriate components and materials and suggest ways of manipulating them to achieve a desired effect. <u>Core Knowledge</u> Properties of components and materials determine how they can and cannot be used.	<u>Skills</u> Plan which materials will be needed for a task and why. <u>Core Knowledge</u> Materials for a specific task must be selected on the basis of their properties.	<u>Skills</u> Choose from a range of materials, showing an understanding of their different characteristics. <u>Core Knowledge</u> - Characteristics of materials such as rigidity, strength and smoothness will affect the success of the working model. - Visual qualities of the yarn can include colour, elasticity, pattern and texture. - Fabrics can be natural or synthetic. - Natural fabrics include cotton, silk and wool.	<u>Skill</u> Select and combine materials with precision. <u>Broad Knowledge</u> Materials should be cut or combined with precision. For example, fabric could be cut with sharp scissors and sewn together using a variety of stitching techniques.	<u>Skills</u> Choose the best material for the task showing an understanding of their working characteristics. <u>Core Knowledge</u> It is important to understand the characteristics of different materials to select the most appropriate material for a purpose. This might include flexibility, waterproofing, texture, colour, cost and availability.

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				Synthetic fabrics include nylon, polyester and Lycra.		
Decorating and embellishing.	<u>Skills</u> Use gluing, stapling or tying to decorate fabric including buttons or sequins. <u>Core Knowledge</u> Decorations can be attached to fabrics by gluing, stapling or tying.	<u>Skills</u> Add simple decorative embellishments such as buttons, prints, sequins and applique. <u>Core Knowledge</u> Embellishment is a decorative detail added to something to make it more attractive.	<u>Skills</u> Decorate a loom weaving using embellishments, such as natural or silk flowers, tassels and bows. <u>Broad Knowledge</u> A loom weaving is a piece of fabric that has been woven on a loom by interlacing threads. An embellishment is a decorative detail.	<u>Skills</u> Create a detailed decorative pattern on fabric by using printing techniques. <u>Core Knowledge</u> Block printing and fabric paint are used to create a decorative repeat pattern on fabrics.	<u>Skills</u> Use applique to add decoration to a product or artwork. <u>Core Knowledge</u> Applique is a technique where pieces of material are added to another by gluing or stitching.	<u>Skills</u> Use different methods for fastening for function and decoration, including press studs, Velcro or buttons. <u>Broad Knowledge</u> Fastenings hold a piece of clothing together. Types of fastenings include zips, press studs, Velcro or buttons.
Food preparation and cooking.	<u>Skills</u> Measure and weigh food items using non-standard measures, such as spoons and cups. <u>Broad Knowledge</u> Using non-standard measures is a way of measuring that does not involve reading scales.	<u>Skills</u> Prepare ingredients by peeling, grating, chopping and slicing. <u>Broad Knowledge</u> Some ingredients need to be prepared before they can be cooked or eaten. There are many ways to prepare ingredients: Peeling skins using a vegetable peeler;	<u>Skills</u> Prepare and cook a simple savoury dish. <u>Core Knowledge</u> Preparation techniques for savoury dishes include peeling, chopping, deseeding, slicing, dicing, grating, mixing and skinning.	<u>Skills</u> Identify and use a range of cooking techniques to prepare a simple meal or snack. <u>Core Knowledge</u> Cooking techniques include baking, boiling, frying, grilling, roasting.	<u>Skills</u> Use an increasing range of preparation and cooking techniques to cook a sweet or savoury dish. <u>Core Knowledge</u> Sweet dishes are usually desserts such as cakes, fruit	<u>Skills</u> Follow a recipe that requires a variety of techniques and source the necessary ingredients independently. <u>Core Knowledge</u> Ingredients can usually be bought at supermarkets, but specialist shops may

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		grating hard ingredients, such as cheese or chocolate; chopping vegetables, such as onions and peppers and slicing foods, such as breads and apples.			pies and trifles. • <u>Savoury dishes usually have a salty or spicy flavour rather than a sweet one.</u>	stock different items such as specialist vegetables or meats. • Greengrocers sell fruit and vegetables, butchers sell meat, fishmongers sell fresh fish and delicatessens sell some unusually prepared foods as well as cold meats and cheeses.
Nutrition		<u>Skills</u> Describe the types of food needed for a healthy and varied diet and apply the principles to make a simple, healthy meal. <u>Core Knowledge</u> • A healthy diet should include meat or fish, starchy foods (such as potatoes or rice), some dairy foods, a small amount	<u>Skills</u> Identify the main food groups (carbohydrates, protein, dairy, fruits and veg, fats and sugars) <u>Core Knowledge</u> • There are five main food groups; carbohydrates, protein, dairy, fruits and veg, fats and sugars	<u>Skills</u> Design a healthy snack or packed lunch and explain why it is healthy. <u>Core Knowledge</u> • Foods need packaging to keep them fresh, safe to eat and free from damage. • Food packaging also provides nutritional information	<u>Skills</u> Evaluate meals and consider if they contribute to a healthy, balanced diet. <u>Core Knowledge</u> • A balanced diet gives your body all the nutrients it needs to function correctly. This means eating a wide variety of	<u>Skills</u> Plan a healthy, daily diet, justifying why each meal contributes towards a balanced diet. <u>Core Knowledge</u> • Eating a balanced diet is a positive lifestyle choice that should be sustained over time. • Food packaging provides

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		of fat and plenty of fruit and vegetables.	Foods high in fat or sugar should only be eaten occasionally as part of a healthy, balanced diet.	about the food inside.	foods in the correct proportions.	important nutritional information about the food inside.
Origins of food	<u>Skills</u> Sort foods into groups by whether they are from an animal or a plant. <u>Core Knowledge</u> - Some foods come from animals, such as meat, fish or dairy products. - Some come from plants, such as fruit or vegetables.	<u>Skills</u> Identify the origins of some common foods (milk, eggs, some meats, some common fruits and vegetables) <u>Core Knowledge</u> - Food comes from two main sources: animals and plants. - Milk comes mainly from cows, but also goats and sheep. - Eggs belong to the animal category. - Eggs are laid by female animals. The most common type of egg eaten is chicken and duck.	<u>Skills</u> Identify and name foods that are produced in different places. <u>Broad Knowledge</u> The types of food that will grow in a particular area will depend on a range of factors such as, rainfall, climate, and soil type.	<u>Skills</u> Identify and name foods that are produced in the UK and beyond. <u>Core Knowledge</u> Particular areas of the world have conditions suited to growing certain crops, such as coffee in Peru and citrus fruits in California in the United States.	<u>Skills</u> Describe what seasonality means and explain some of the reasons why it is beneficial. <u>Core Knowledge</u> - Buying seasonal foods is beneficial for many reasons. These include the food having higher nutritional value, reducing transportation and supporting local growers. - Seasonality is the time of year when the harvest	<u>Skills</u> Explain how organic produce is grown <u>Core Knowledge</u> - Whole foods have not been changed from their natural form. - Organic whole foods have been grown without the use of man-made fertilisers or pesticides.

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		• Honey is made by bees. • Most edible oils are made from plant parts. • Olive oil, vegetable oil and coconut oil all come from plant parts sources. • Sugar is made from plants called sugar cane and sugar beet. • Plants also give us nuts such as almonds, walnuts and hazelnuts.			or flavour of the food is at it's best.	
Compare and contrast	<u>Skills</u> Describe the similarities and differences between two products. <u>Core Knowledge</u> • Two products can be compared by looking at a set criteria and scoring both products against each one.	<u>Skill</u> Compare different or the same products from the same or different brands. <u>Core Knowledge</u> • A brand is a name, term, design or symbol identifying a sellers'	<u>Skill</u> Explain the similarities and differences between the work of two designers <u>Core Knowledge</u> • Work from different designers can be compared by assessing specific	<u>Skills</u> Create and complete a comparison table to compare two or more products. <u>Core Knowledge</u> • A comparison table is an organised way to compare products.	<u>Skills</u> Survey users in a range of focus groups and compare results. <u>Core Knowledge</u> • Evaluations can be made by asking product users a selection of questions to obtain data	<u>Skills</u> Create a detailed comparative report about two or more products or inventions. <u>Core Knowledge</u> • Products and inventions can be compared using a range of criteria, such as the

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		products or services.	criteria, such as their visual impact, fitness for purpose and target market.		on how the product has met the design criteria.	impact on society, ease of use, appearance and value for money.
Significant People	<u>Skills</u> Describe why a product is important. <u>Broad Knowledge</u> The importance of a product may be that it fulfils it's goals and performs a useful purpose.	<u>Skills</u> Explain why a designer or inventor is important. <u>Core Knowledge</u> • School Kitchen staff are important people because they design and provide healthy meals. • The Cath Kidston brand was an important British brand, which began in the 1990's. • It was easily recognisable for it's floral patterned fabric and use of classic British iconography including the Red London	<u>Skills</u> Describe how key events in Design and Technology have shaped the world. <u>Broad Knowledge</u> Key inventions in design and technology have changed the way people live.	<u>Skills</u> Explain how and why a significant designer or inventor shaped the world. <u>Core Knowledge</u> • Food deteriorates due to the growth of micro-organisms. • Significant Scientists such as Louis Pasteur, Nicolas Appert ensured decay can be prevented or delayed by preservation methods such as drying, salting, pickling, canning, pasteurising, refrigerating	<u>Skills</u> Describe the social influence of a significant designer or inventor. <u>Core Knowledge</u> • A Roman Architect called Vitruvius said that successful buildings should have firmitas (stability), utilitas (useful space) and venustas (an attractive appearance).	<u>Skills</u> Present a detailed account of the significance of a favourite designer or inventor. <u>Core Knowledge</u> • Significant engineers have improved safety, peoples lives and trade through their constructions. • Significant bridges include: The Menai Bridge, Clifton Suspension Bridge and Forth Bridge.

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		bus and London black cab.		and freezing the food. • The use by date shows when the food is no longer safe to eat. • The best before date shows when the food will lose some flavour or texture. • William Morris was a British textile Designer, artist and social activist associated with the British Arts and crafts movement. • William Morris was a significant contributor to the revival of traditional British textile arts and methods of production. • William Morris' motifs mainly consisted of leaves,		
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				flowers, fruits and birds.		
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