#teamchurchill 2023-24

Big idea	Concept/Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Humankind	Everyday products	AOL: Exp A&D Skill Name and explore a range of everyday products and begin to talk about how they are used. Assign	Skill Name and explore a range of everyday products and describe how they are used. Core knowledge • An axle 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 designed to give protection from weather or danger. Covered x 2	Skill Explain how an everyday product could be improved. Core knowledge • There are many home products made from fabric. • Examples of fabric based products in the home include cushions, curtains, blinds and carpets. • Products can be improved in different ways, such as making them easier to use, more hardwearing or more attractive. Covered x 2	Skill Explain how an existing product benefits the user. Core knowledge • Particular products are designed for specific tasks. For example designing a product to help grow plants will require certain materials. Covered x 2	Skill Investigate and identify the design features of a familiar product. Core knowledge • Design features are the aspects of a product's design that the designer would like to emphasise. For example, the use of a particular material or a feature that makes the product durable. • 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. • A programmable device is a machine that is provided with coded instructions for the automatic performance of a task. Covered x 6	Skill Explain how the design of a product has been influenced by the culture or society in which it was designed or made. Core knowledge • The design of products needs 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. Covered x 2	Skill Analyse how an invention or product has significantly changed or improved people's lives. Core knowledge • Make Do and Mend was a campaign 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. • The Make Do and Mend campaigns aimed to limit the amount of labour and materials used in clothes production, so that it could be used to support the greater 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 of nutrients and contain unhealthy ingredients when compared to whole foods. • Sliced bread is processed. It can contain many more ingredients than homemade bread, including preservatives and artificial ingredients. • Bridge structures have changed over time. This is due to factors such as technology, design innovation and new and better access to materials. Covered x 4
	Staying safe	AOL: PSED AOL: PD Skill Follow rules and instructions to keep safe. Core knowledge • Rules keep us safe when using equipment. Covered	Skill Follow the rules to keep safe during a practical task. Core knowledge • Rules are made to keep people safe from danger. • Safety rules include always listening carefully, following instructions and using equipment only when told to. Covered x 2	Skill Work safely and hygienically in construction and cooking activities. Core knowledge • Hygiene rules include washing hands before handling food, cleaning surfaces, tying long hair back, storing food appropriately and wiping up spills. Covered	Skill Use appliances safely with adult supervision. Core knowledge • 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 never be used around water and a plug should never be pulled out by its cord. Covered	Skill Work safely with everyday chemical products under supervision, such as disinfectant hand wash and surface cleaning spray. Core knowledge • Chemicals are used in the home every day. They include cleaning products, such as bleach and disinfectant, but also paints, glues, oils, pesticides and medicines. • Chemicals should only be used under adult supervision. Covered	Skill Explain the functionality and purpose of safety features on a range of products. Covered	Skill Demonstrate how their products take into account the safety of the user. Core knowledge • The safety of the user has to be taken into account when designing a new product. Covered
Processes	Mechanisms and movement	AOL: Exp A&D Skill Explore, build and play with a range of resources and construction kits with wheels and axles. Core knowledge • Vehicles and machines have wheels and axles to help them move. Covered x 4	Skill Use wheels and axles to make a simple moving model. Core knowledge • Most vehicles that move on land have axles and wheels that are fixed to a chassis. • An axle fixed to a chassis has freely moving wheels. • A freely moving axle has fixed wheels. Covered x 2	Skill Use a range of mechanisms (levers, sliders, wheels and axles) in models or products. Core knowledge • People build machines to make their work easier. • A machine is made up of different parts that all work together to perform a task. • Individual parts of a machine are called components. • The part of a machine that brings about movement is called the mechanism. • A slider mechanism moves in a straight line. • Real-life examples of slider mechanisms include door bolts and drawers. • A lever mechanism is a bar that moves around a fixed point called a pivot. • Real-life uses of levers include scissors and seesaws. • A linkage mechanism combines levers and sliders. • Real-life uses of linkages include toolboxes and scissor lifts. Covered x 4	Skill Explore and use a range of mechanisms (levers, sliders, axles, wheels and cams) in models or products. Core knowledge • Cams are devices that can convert circular motion into up-and-down motion. • The cam is fixed to the axle and the follower sits on the cam. When the axle is rotated, the follower moves up and down, following the shape of the cam. • Different shaped cams produce different patterns of movement in the follower. Covered x 3	Skill Explore and use a range of mechanisms (levers, axles, cams, gears and pulleys) in models or products. Core knowledge • Simple machines make physical jobs easier by changing the strength or direction of a force. • There are six simple machines: pulley, lever, wheel and axle, wedge, inclined plane and screw. • Simple machines can be combined to make complex, compound machines. For example, a wheelbarrow combines a lever with a wheel and axle. Covered x 3	Skill Use mechanical systems in their products, such as pneumatics. Core knowledge • A pneumatic system uses 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. Covered x 3	Skill Explain and use mechanical systems in their products to meet a design brief. Assign

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	Electricity	AOL: Exp A&D Skill Identify products that use electricity to make them work. Assign	Skill Identify products that use electricity to make them work and describe how to switch them on and off. Assign	Skill Create an operational, simple series circuit. Assign	Skill Incorporate a simple series circuit into a model. Assign	Skill Incorporate circuits that use a variety of components into models or products. Covered	Skill Use electrical circuits of increasing complexity in their models or products, showing an understanding of control. Assign	Skill Understand and use electrical circuits that incorporate a variety of components (switches, lamps, buzzers and motors) and use programming to control their products. Covered x 2
Creativity	**Generation of ideas**	AOL: Exp A&D Skill Create collaboratively, share ideas and use a variety of resources to make products inspired by existing products, stories or their own ideas, interests or experiences. Covered x 15	Skill Create a design to meet simple design criteria. Core knowledge • A product or project is usually guided by a set of design criteria. • The project or product must meet the design criteria to be successful. Covered x 4	Skill Generate and communicate their ideas through a range of different methods. Covered x 3	Skill Develop design criteria to inform a design. Core knowledge • Design criteria are the exact goals a project must achieve to be successful. • These criteria might include the product's use, appearance, cost and target user. Covered x 3	Skill Use annotated sketches and exploded diagrams to test and communicate their ideas. Core knowledge • Annotated sketches and exploded diagrams show specific parts of a design, highlight sections or show functions. They communicate ideas in a visual, detailed way. Covered x 4	Skill Use pattern pieces and computer-aided design packages to design a product. Core knowledge • Computer-aided design (CAD) is the use of specialised computer software to design objects. • CAD designs can also be made into objects using 3-D printers. Covered	Skill Develop design criteria for a functional and appealing product that is fit for purpose, communicating ideas clearly in a range of ways. Core knowledge • 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. Covered x 2
	Structures	AOL: Exp A&D Skill Construct simple structures and models using a range of materials. Core knowledge • A bridge is a structure that allows people and vehicles to cross over an open space. Covered x 11	Skill Construct simple structures, models or other products using a range of materials. Core knowledge • Different materials can be used for different purposes, depending on their properties. Covered x 10	Skill Explore how a structure can be made stronger, stiffer and more stable. Core knowledge • Structures can be made stronger, stiffer and more stable by using cardboard rather than paper and triangular shapes rather than squares. Covered x 3	Skill Create shell or frame structures using diagonal struts to strengthen them. Core knowledge • Diagonal struts create triangular shapes within a frame structure. • Adding diagonal struts to a frame structure adds strength and stability. Covered	Skill Prototype shell and frame structures, showing awareness of how to strengthen, stiffen and reinforce them. Core knowledge • A prototype is a mock-up of a design that will look like the finished product but may not be full size or made of the same materials. Covered	Skill Build a framework using a range of materials to support mechanisms. Core knowledge • Support, stiffness and stability can be created by using triangular shapes to create strong frameworks, columns to support roofs and overlapping 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. Covered x 3	Skill Select the most appropriate materials and frameworks for different structures, explaining what makes them strong. Core knowledge • Strength can be added to a framework by using multiple layers or changing its shape. • Triangles do not collapse or distort easily and so are used in architecture to provide support and stability. Covered x 2
	Use of ICT	AOL: Exp A&D Skill Use digital devices to take digital images or recordings of their creations to share with others. Covered	Skill Use design software to create a simple plan for a design. Assign	Skill Use design software to create a simple labelled design or plan. Assign	Skill Write a program to make something move on a tablet or computer screen. Assign	Skill Write a program to control a physical device, such as a light, speaker or buzzer. Core knowledge • Remote control is controlling a machine or activity from a distance. Computers can be used to remotely control a device. Covered x 2	Skill Link a physical device to a computer or tablet so that it can be controlled (such as changing motor speed or turning an LED on and off) by a program. Assign	Skill Use a sensor to monitor an environmental variable, such as temperature, sound or light. Core knowledge • Many devices that we see in our homes and elsewhere use programmable sensors that monitor environmental variables, such as light, sound, movement and temperature. Covered x 2
Investigation	**Investigation**	AOL: PD Skill Choose and explore appropriate tools for simple practical tasks. Core knowledge • There are different ways to join materials together. Covered x 7	Skill Select the appropriate tool for a simple practical task. Core knowledge • Some foods need to be prepared before eating. • Peeling, slicing, chopping, grating, tearing or mashing are different methods of preparing foods. Covered	Skill Select the appropriate tool for a task and explain their choice. Core knowledge • 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. Covered x 4	Skill Use tools safely for cutting and joining materials and components. Covered x 4	Skill Select, name and use tools with adult supervision. Covered	Skill Name and select increasingly appropriate tools for a task and use them safely. Covered	Skill Select appropriate tools for a task and use them safely and precisely. Core knowledge • Deconstructing garments identifies how they were made, the materials used and their properties. • Hand stitches include running stitch, blanket stitch and whip stitch. Covered x 2
	Evaluation	AOL: Exp A&D Skill Adapt and refine their work as they are constructing and making. Covered x 4	Skill Talk about their own and each other's work, identifying strengths or weaknesses and offering support. Core knowledge • A strength is something that is good about a piece of work. • A weakness is an area that could be improved. Covered x 3	Skill Explain how closely their finished products meet their design criteria and say what they could do better in the future. Core knowledge • A finished product can be checked against design criteria to see how successfully it has been made or to evaluate how well it works. • Improvements can then be planned. Covered x 4	Skill Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account. Core knowledge • Asking questions can help others to evaluate their products. For example, asking someone whether the materials selected helped achieve the purpose of the model. Covered x 4	Skill Identify what has worked well and what aspects of their products could be improved, acting on their own suggestions and those of others when making improvements. Core knowledge • 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 explaining why they should be made. Covered x 4	Skill Test and evaluate products against a detailed design specification and make adaptations as they develop the product. Core knowledge • Testing a product against the design criteria will highlight anything that needs improvement or redesign. Covered x 3	Skill Demonstrate modifications made to a product as a result of ongoing evaluation by themselves and to others. Core knowledge • An iterative process starts with 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. Covered x 3

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Materials	**Cutting and joining textiles**		Skill Cut and join textiles using glue and simple stitches. Core knowledge • A running stitch is made by passing a needle in and out of fabric. • Running stitches are made at equal distances apart. Covered	Skill Use different methods of joining fabrics, including glue and running stitch. Core knowledge • A running stitch is a basic stitch used to join two pieces of fabric. Covered	Skill Cut and join wools, threads and other materials to a loom. Core knowledge • Weaving involves interlacing pieces of thread or yarn or other materials. Covered	Skill Hand sew a hem or seam using a running stitch. Core knowledge • A hem runs along the edge of a piece of cloth or clothing. It is made by turning under a raw edge and sewing to give a neat and quality finish. Covered	Skill Combine stitches and fabrics with imagination to create a mixed media collage. Core knowledge • A collage is artwork made by sticking materials, such as scraps of paper or fabric, onto a background. • A mixed media collage is made using various materials and media, such as ink and paint. Covered	Skill Pin and tack fabrics in preparation for sewing and more complex pattern work. Covered x 2
	Materials for purpose	AOL: Exp A&D Skill Select appropriate materials when constructing and making. Covered x 5	Skill Select and use a range of materials, beginning to explain their choices. Covered x 2	Skill Choose appropriate components and materials and suggest ways of manipulating them to achieve the desired effect. Core knowledge • Properties of components and materials determine how they can and cannot be used. Covered x 5	Skill Plan which materials will be needed for a task and explain why. Core knowledge • Materials for a specific task must be selected on the basis of their properties. For example greenhouses need transparent or translucent materials. Availability and cost have also got to be considered. Covered x 2	Skill Choose from a range of materials, showing an understanding of their different characteristics. Core knowledge • Characteristics of materials, such as rigidity, strength and smoothness will affect the success of a working model. • Visual qualities of a yarn can include its colour, elasticity, pattern and texture. • Fabrics can be natural or synthetic. • Natural fabrics include cotton, silk and wool. • Synthetic fabrics include Lycra, polyester and nylon. Covered x 5	Skill Select and combine materials with precision. Covered x 2	Skill Choose the best materials for a task, showing an understanding of their working characteristics. Core knowledge • 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. Covered x 4
	Decorating and embellishing textiles		Skill Use gluing, stapling or tying to decorate fabric, including buttons and sequins. Core knowledge • Decorations can be attached to fabric by gluing, stapling or tying. Covered	Skill Add simple decorative embellishments, such as buttons, prints, sequins and appliqué. Core knowledge • Embellishment is a decorative detail or feature added to something to make it more attractive. Covered	Skill Decorate a loom weaving using embellishments, such as natural or silk flowers, tassels and bows. Covered	Skill Create detailed decorative patterns on fabric using printing techniques. Core knowledge • Block printing and fabric paint are used to create decorative, repeated patterns on fabrics. Covered	Skill Use applique to add decoration to a product or artwork. Core knowledge • Applique is a technique where pieces of material are attached to another material by stitching or gluing. Covered	Skill Use different methods of fastening for function and decoration, including press studs, Velcro and buttons. Covered
Nature	**Food preparation and cooking**	AOL: Maths Skill Follow instructions, including simple recipes, that include measures and ingredients. Core knowledge • When people celebrate they sometimes eat special food. Covered x 2	Skill Measure and weigh food items using non-standard measures, such as spoons and cups. Core knowledge • Fruits and vegetables can be mixed to make a healthy salad. • Salad dressings can improve the flavour of salads. Covered x 2	Skill Prepare ingredients by peeling, grating, chopping and slicing. Core knowledge • A recipe is a set of instructions for preparing and cooking a meal. Covered	Skill Prepare and cook a simple savoury dish. Core knowledge • Preparation techniques for savoury dishes include peeling, chopping, deseeding, slicing, dicing, grating, mixing and skinning. Covered x 3	Skill Identify and use a range of cooking techniques to prepare a simple meal or snack. Core knowledge • Cooking techniques include baking, boiling, frying, grilling and roasting. Covered	Skill Use an increasing range of preparation and cooking techniques to cook a sweet or savoury dish. Core knowledge • Sweet dishes are usually desserts, such as cakes, fruit pies and trifles. • Savoury dishes usually have a salty or spicy flavour rather than a sweet one. Covered x 2	Skill Follow a recipe that requires a variety of techniques and source the necessary ingredients independently. Core knowledge • Ingredients can usually be bought at supermarkets, but specialist shops may stock different items such as specialist vegetables or coffees. • Greengrocers sell fruit and vegetables, butchers sell meat, fishmongers sell fresh fish and delicatessens usually sell some unusual prepared foods, as well as cold meats and cheeses. Covered x 3
	Nutrition	AOL: PSED Skill Suggest healthy ingredients that can be used to make simple snacks. Assign	Skill Select healthy ingredients for a fruit or vegetable salad. Core knowledge • Fruit and vegetables are an important part of a healthy diet. • It is recommended that people eat at least five portions of fruit and vegetables every day. Covered	Skill Describe the types of food needed for a healthy and varied diet and apply the principles to make a simple, healthy meal. Core knowledge • A healthy diet should include meat or fish, starchy foods (such as potatoes or rice), some dairy foods, a small amount of fat and plenty of fruit and vegetables. Covered	Skill Identify the main food groups (carbohydrates, protein, dairy, fruits and vegetables, fats and sugars). Core knowledge • There are five main food groups: fruit and vegetables; carbohydrates (potatoes, bread, rice and pasta); proteins (beans, pulses, fish, eggs and meat); dairy and alternatives (milk, cheese and yoghurt) and fats (oils and spreads). • Foods high in fat, salt and sugar should only be eaten occasionally as part of a healthy, balanced diet. Covered	Skill Design a healthy snack or packed lunch and explain why it is healthy. Core knowledge • Foods need packaging to keep them fresh, safe to eat and free from damage. • Food packaging also provides nutritional information about the food inside. Covered x 3	Skill Evaluate meals and consider if they contribute towards a balanced diet. Core knowledge • A balanced diet gives your body all the nutrients it needs to function correctly. This means eating a wide variety of foods in the correct proportions. Covered x 3	Skill Plan a healthy daily diet, justifying why each meal contributes towards a balanced diet. Core knowledge • Eating a balanced diet is a positive lifestyle choice that should be sustained over time. • Food packaging provides important nutritional information about the food inside. Covered

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	Origins of food	AOL: World Skill Begin to identify the origins of some foods. Assign	Skill Sort foods into groups by whether they are from an animal or plant source. Core knowledge • Some foods come from animals, such as meat, fish and dairy products. • Some come from plants, such as fruit and vegetables. Covered	Skill Identify the origin of some common foods (milk, eggs, some meats, common fruit and vegetables). Core knowledge • Food comes from two main sources: animals and plants. • Milk comes mainly from cows but also from goats and sheep. • Eggs belong to the animal product category. • They are laid by female animals. The most common types eaten by humans include chicken and duck eggs. • Honey is made by bees. • Most edible oils are made from plant parts. • Olive oil, vegetable oil and coconut oil are all made from plant sources. • Sugar is made from plants called sugar cane and sugar beet. • Plants also give us nuts, such as almonds, walnuts and hazelnuts. Covered	Skill Identify and name foods that are produced in different places. Covered	Skill Identify and name foods that are produced in different places in the UK and beyond. Core knowledge • 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 of America. Covered	Skill Describe what seasonality means and explain some of the reasons why it is beneficial. Core knowledge • Buying seasonal food 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 or flavour of a type of food is at its best. Covered x 3	Skill Explain how organic produce is grown. Core knowledge • Whole foods have not been changed from their natural form. • Organic whole foods are grown without the use of man-made fertilisers, pesticides, growth regulators or animal feed additives. Covered
Comparison	**Compare and contrast**	AOL: Exp A&D Skill Describe what, why and how something was made and compare with others. Covered	Skill Describe the similarities and differences between two products. Core knowledge • Two products can be compared by looking at a set of criteria and scoring both products against each one. Covered x 2	Skill Compare different or the same products from the same or different brands. Core knowledge • A brand is a name, term, design, or symbol identifying a seller's products or services. Covered	Skill Explain the similarities and difference between the work of two designers. Core knowledge • Work from different designers can be compared by assessing specific criteria, such as their visual impact, fitness for purpose and target market. Covered	Skill Create and complete a comparison table to compare two or more products. Core knowledge • A comparison table is an organised way to compare products. Covered x 3	Skill Survey users in a range of focus groups and compare results. Core knowledge • Evaluations can be made by asking product users a selection of questions to obtain data on how the product has met its design criteria. Covered	Skill Create a detailed comparative report about two or more products or inventions. Core knowledge • Products and inventions can be compared using a range of criteria, such as the impact on society, ease of use, appearance and value for money. Covered x 4
Significance	**Significant people**	AOL: Exp A&D Skill Explore significant products. Assign	Skill Describe why a product is important. Assign	Skill Explain why a designer or inventor is important. Core knowledge • 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 1990s. • It was easily recognisable for its floral patterned fabric and use of classic British iconography including the Red London Bus and London black cab. Covered x 2	Skill Describe how key events in design and technology have shaped the world. Covered	Skill Explain how and why a significant designer or inventor shaped the world. Core knowledge • Food deteriorates due to the growth of microorganisms. • Significant scientists such as Louis Pasteur and inventors such as Nicolas Appert have ensured decay can be prevented or delayed by preservation methods, such as drying, salting, pickling, canning, pasteurising, refrigerating or freezing the food. • The 'use by' date shows when the food is no longer safe to eat. • The 'best before' date shows the date after which the food will lose some flavour or texture. • William Morris was a British textile designer, artist and socialist 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 consisted mainly of leaves, flowers, fruits and birds. Covered x 4	Skill Describe the social influence of a significant designer or inventor. Core knowledge • A Roman architect called Vitruvius said that successful buildings should have firmitas (stability), utilitas (useful space) and venustas (an attractive appearance). Covered	Skill Present a detailed account of the significance of a favourite designer or inventor. Core knowledge • Significent engineers have improved, safety, people's lives and trade through their constructions. • Significant bridges include: the Menai Bridge, Clifton Suspension Bridge and Forth Bridge. Covered