Humankind	Concept/Aspect Everyday products	Reception	Year 1 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	Year 2 Skill Explain how an everyday product could be improved. Core knowledge • There are many home products made from fabric.	specific tasks. For example	Investigate and identify the design features of a familiar product. Core knowledge • A switch makes or breaks a circuit.	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	
			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 Follow the rules to keep safe during a	• Examples of fabric based products in the home include cushions, curtains, blinds and carpets. Covered Skill Work safely and hygienically in	designing a product to help grow plants will require certain materials.	 When a switch is closed or 'on', the circuit is complete. When a switch is open or 'off', the circuit is incomplete. 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. Covered x 4 	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 Explain the functionality and purpose of	
			rollow 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	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 Covered	Supervision. Core knowledge	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.	Safety features on a range of products. Broad knowledge Safety features are often incorporated into products that might cause harm. Some examples include the child-safety caps on medicine bottles, seatbelts in cars, covers for electrical sockets and finger guards on doors. Covered	Core knowledge The safety of the user has to be taken into account when designing a new product.
Processes		Skill Explore, build and play with a range of resources and construction kits with wheels and axles. Core knowledge • Wheels help vehicles move. • An axle is a rod that goes through the middle of the wheel to help it stay in place. • Vehicles have wheels and axles to help them move. Covered x 3	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	Use a range of mechanisms (levers, sliders, wheels and axles) in models or products. Broad knowledge A mechanism is a device that takes one type of motion or force and produces a different one. A mechanism makes a job easier to do. Mechanisms include sliders, levers, linkages, gears, pulleys and cams. Assign	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		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	Explain and use mechanical systems in their products to meet a design brief. Broad knowledge Mechanical systems can include sliders, levers, linkages, gears, pulleys and cams. Other mechanisms include pneumatics and hydraulics. Assign
		Identify products that use electricity to make them work. Core knowledge Microwaves, toasters and blenders are machines. Machines need power to make them work. Covered	Identify products that use electricity to make them work and describe how to switch them on and off. Broad knowledge 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 to prevent electricity from flowing. This can be a switch on the appliance or a wall socket switch. Assign	Create an operational, simple series circuit. Broad knowledge A series circuit is made up of an energy source, such as a battery or cell, wires and a bulb. The circuit must be complete for the electricity to flow. Assign	model. Broad knowledge An electric circuit can be used in a model,	Incorporate circuits that use a variety of components into models or products. Broad knowledge Components can be added to circuits to achieve a particular goal. These include bulbs for lighthouses and torches, buzzers for burglar alarms and electronic games, motors for fairground rides and motorised vehicles and switches for lights and televisions. Covered	Use electrical circuits of increasing complexity in their models or products, showing an understanding of control. Broad knowledge Electrical circuits can be controlled by a simple on/off switch, or by a variable resistor that can adjust the size of the current in the circuit. Real-life examples are a dimmer switch for lights or volume control on a stereo. Assign	Understand and use electrical circuits that incorporate a variety of components (switches, lamps, buzzers and motors) and use programming to control their products. Broad knowledge Computer programs can control electrical circuits that include a variety of components, such as switches, lamps, buzzers and motors. Covered x 2
Investigation		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 10	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	ways, including written work, drawings and diagrams, modelling, speaking and using	These criteria might include the product's use, appearance, cost and target user. Covered x 3	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	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	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
		Construct simple structures and models using a range of materials. Core knowledge There are lots of different types of puppets. Some puppets have moving parts.	Construct simple structures, models or other products using a range of materials. Broad knowledge Different materials can be used for different purposes, depending on their properties. For example, cardboard is a stronger building material than paper. Plastic is light and can float. Clay is heavy and will sink. Covered x 2	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 2	Core knowledge Diagonal struts create triangular shapes within a frame structure. Adding diagonal struts to a frame structure adds strength and stability. Covered	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 Covered	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.	 Triangles do not collapse or distort easily and so are used in architecture to provide support and stability.
		information about creations with others.	Use design software to create a simple plan for a design. Broad knowledge Computer-aided design is when computers are used to help design products. It has advantages over paper design in that it will show how finished products will look. Different colours and textures can also be trialled. Assign	Broad knowledge Computer software can be used to help design or plan a product. Advantages		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	Covered x 3 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 or and off) by a program. Broad knowledge Equipment and devices can be controlled by pressing buttons on a control panel, such as on a washing machine or microwave. Assign	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 Skill
		Choose and explore appropriate tools for simple practical tasks. Core knowledge • Sewing is stitching things using a needle and thread. Covered x 3	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	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 3	Use tools safely for cutting and joining materials and components. Broad knowledge 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. Covered x 4	craft knives, junior hacksaws with pistol grip and bench hooks. Useful tools for joining include glue guns. Tools should only be used with adult supervision and safety rules must be followed. Covered	edge pointing away from their body. All tools should be cleaned and put away after use, and should not be used if they are loose or cracked. Covered	 Hand stitches include running stitch, blanket stitch and whip stitch. Covered x 2
		Adabt and fellie their work as they are	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	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 3	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	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	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	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
Materials			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	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	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	Combine stitches and fabrics with imagination to create a mixed media collage. Broad 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.	Pin and tack fabrics in preparation for sewing and more complex pattern work. Broad knowledge Pinning with dressmaker pins and tacking with quick, temporary stitches holds fabric together in preparation for and during sewing. Covered x 2
		constructing and making. Broad knowledge Different materials are suitable for different purposes, such as construction kits for modelling and ingredients for	Skill Select and use a range of materials, beginning to explain their choices. Broad knowledge Different materials are suitable for different purposes, depending on their specific properties. For example, glass is transparent, so it is suitable to be used for windows. Covered x 2	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 2	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	 Characteristics of materials, such as 	Skill Select and combine materials with precision. Broad knowledge Materials should be cut and combined with precision. For example, pieces of fabric could be cut with sharp scissors and sewn together using a variety of stitching techniques. Covered x 2	 It is important to understand the
			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	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	Decorate a loom weaving using embellishments, such as natural or silk flowers, tassels and bows. Broad knowledge A loom weaving is a piece of fabric that has been woven on a loom by interlacing threads. An embellishment is a decorative detail or feature, such as a silk flower, tassel or bow, added to something to make it more attractive. Covered		Use applique to add decoration to a product or artwork. Broad knowledge Applique is a technique where pieces of material are attached to another material by stitching or gluing. Assign	Use different methods of fastening for function and decoration, including press studs, Velcro and buttons. Broad knowledge Fastenings hold a piece of clothing together. Types of fastenings include zips, press studs, Velcro and buttons. Covered
Nature		Follow instructions, including simple recipes, that include measures and ingredients. Core knowledge A recipe is a set of instructions that tells us how to make food. Covered	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		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	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	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	
		Suggest healthy ingredients that can be used to make simple snacks. Core knowledge • Fruit and vegetables are healthy food. Covered	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	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	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	• Food packaging also provides nutritional information about the food inside. Covered x 3	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	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
		Begin to identify the origins of some foods. Core knowledge Food can be from plants such as fruit, vegetables, nuts and seeds. Animals provide meat and also produce food such as milk, eggs and honey. Covered	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	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.	Identify and name foods that are produced in different places. Broad knowledge The types of food that will grow in a particular area depend on a range of factors, such as the rainfall, climate and soil type. For example, many crops, such as potatoes and sugar beet, are grown in the south-east of England. Wheat, barley and vegetables grow well in the east of England. Covered	United States of America.	Describe what seasonality means and explain some of the reasons why it is beneficial. Core knowledge • Seasonality is the time of year when the harvest or flavour of a type of food is at its best. Covered x 2	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		AOL: Exp A&D Skill Describe what, why and how something was made and compare with others. Broad knowledge Aspects of designing and making can be compared with others, including inspiration for making a product and the tools and techniques used.	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	Covered 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	criteria, such as their visual impact, fitness for purpose and target market.	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	of use, appearance and value for money.
Significance		AOL: Exp A&D Skill Explore significant products. Broad knowledge Some products are significant because they have changed the way people live their lives. Covered	Describe why a product is important. Broad knowledge The importance of a product may be that it fulfils its goals and performs a useful	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		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.	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