**Curriculum 22 – Subject Sequence for DT**

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| Year Group & Unit | Vocabulary | Knowledge (specific facts or truth components. A knowledge statement will often contain substantive, declarative or explicit knowledge.) | Skills (the use and application of composite knowledge. A skill statement will often contain implicit, procedural and disciplinary knowledge.) |
| Year 1  Childhood – History focus  Key Concepts:  **Structures**  1 Programme of study, 1 skills and 1 knowledge statement  Build structures, exploring how they can be made stronger, stiffer and more stable | .  Enhance provision – Street life | **core 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. | **Y1** **skill** **1** Construct simple structures, models or other products using a range of materials. |
| Year 1  Shade and shelter – DT focus  Key Concepts:  **Compare and contrast**  **Evaluation**  **Everyday products**  **Generation of ideas**  **Materials for purpose**  **Staying safe**  **Structures**  7 Programmes of study, 8 skills and 10 knowledge statements   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.  Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics  Explore and evaluate a range of existing products.  Evaluate their ideas and products against design criteria.  Build structures, exploring how they can be made stronger, stiffer and more stable.  Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world. | Evaluation **change**  **criteria**  **difficulty**  **evaluate**  **evaluation**  **improve**  **strength**  **Weakness**  Generation of ideas  **design**  **design criteria**  **drawing**  **frame**  **function**  **idea**  **label**  **material**  **plan**  **purpose**  **shape**  **Size** Compare and contrast **compare**  **different**  **similar** Everyday products **function**  **permanent**  **protection**  **purpose**  **shelter**  **structure**  **Temporary** Structures **appearance**  **construction**  **design**  **entry point**  **finish**  **functionality**  **joining**  **model**  **product**  **roof**  **safety**  **structure**  **tools**  **Wall** Materials for purpose **brick**  **construction**  **fabric**  **rope**  **stick**  **tarpaulin**  **wooden cane** | **core knowledge**Design criteria are the explicit goals that a project must achieve.  **specific knowledge**A play den is a shelter, usually built outside. It is a temporary structure made from found or readily available materials. It can be used for imaginative play or to provide protection from the weather. | **Y1** **skill** **2** Create a design to meet simple design criteria. |
| **core knowledge**Design criteria are the explicit goals that a project must achieve.  **specific knowledge**A play den is a shelter, usually built outside. It is a temporary structure made from found or readily available materials. It can be used for imaginative play or to provide protection from the weather. | **Y1** **skill** **2** Create a design to meet simple design criteria. |
| **core 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. | **Y1** **skill** **1** Select and use a range of materials, beginning to explain their choices. |
| **core knowledge**Two products can be compared by looking at a set of criteria and scoring both products against each one. **core knowledge**Everyday products are objects that are used routinely at home and school, such as a toothbrush, cup or pencil. All products are designed for a specific purpose.  **specific knowledge**A shelter is a structure designed to give protection from weather or danger. A bus shelter, office block,  garage, carport, tent, bird table, shed, conservatory, house, kennel and caravan are all examples of shelters. A shelter can be permanent, like a house or garage, or temporary, like a tent or gazebo. | **Y1** **skill** **1** Describe the similarities and differences between two products.  **Y1** **skill** **1** Name and explore a range of everyday products and describe how they are used. |
| **core knowledge**A strength is a good quality of a piece of work. A weakness is an area that could be improved. | **Y1** **skill** **1** Talk about their own and each other's work, identifying strengths or weaknesses and offering support. |
| **core 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.  **specific knowledge**A structure should have strong, sturdy supports that are joined so that they do not move. The roof and walls should have a covering for protection against the weather, and there should be an entry point. | **Y1** **skill** **2** Construct simple structures, models or other products using a range of materials. |
| **core knowledge**Rules are made to keep people safe from danger. Safety rules include always listening carefully and following instructions, using equipment only as and when directed, wearing protective clothing if appropriate and washing hands before touching food. | **Y1** **skill** **1** Follow the rules to keep safe during a practical task. |
| Year 1  **Funny Faces and Fabulous Features**    Art focus  Key Concepts:  **Cut and join**  **Decorating textiles**  2 Programmes of study, 2 skills and 2 knowledge statements  Select from and use a range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing  Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. | Cutting and joining textiles **join**  **running stitch**  **Stitch** Decorating and embellishing textiles **bead**  **button**  **glue**  **sequin**  **stitch** | **core knowledge**Scissors are used to cut fabrics. Glue and simple stitches, such as running stitch, can be used to join fabrics. Running stitch is made by passing a needle in and out of fabric at an even distance. | **Y1** **skill** **1** Cut and join textiles using glue and simple stitches. |
| **core knowledge**Fabric can be decorated using materials and small objects, such as buttons and sequins. Decorations can  be attached to the fabric by gluing, stapling or tying. | **Y1** **skill** **1** Use gluing, stapling or tying to decorate fabric, including buttons and sequins. |
| Year 1  Bright Lights, Big City – Geography focus  Key Concepts:  **Structures**  1 Programme of study, 1 skills and 1 knowledge statement  Build structures, exploring how they can be made stronger, stiffer and more stable. | Enhance provision –Constructing landmarks | **core 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. | **Y1** **skill** **1** Construct simple structures, models or other products using a range of materials. |
| Year 1  Seasonal Changes – Science focus  Key Concepts:  **Structures**  1 Programme of study, 1 skills and 1 knowledge statement  Build structures, exploring how they can be made stronger, stiffer and more stable. | Enhance provision – Shelters | **core 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. | **Y1** **skill** **1** Construct simple structures, models or other products using a range of materials. |
| Year 1  Taxi – DT Focus  Project thumbnail  Key Concepts:  **Compare and contrast**  **Evaluation**  **Everyday products**  **Generation of ideas**  **Mechanisms & movement**  5 Programmes of study, 6 skills and 8 knowledge statements  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  Explore and evaluate a range of existing products.  Evaluate their ideas and products against design criteria  Explore and use mechanisms (for example, levers, sliders, wheels and axles), in their products  Build structures, exploring how they can be made stronger, stiffer and more stable. | Evaluation **change**  **improve**  **strength**  **Weakness**  Generation of ideas  **criteria**  **design**  **diagram**  **idea** Compare and contrast **compare**  **different**  **similarity** Staying safe **safety**  **tool** Everyday products **axle**  **chassis**  **vehicle**  **whee** Structures **model**  **Part**  **Test**  Investigation  **attach**  **evaluate**  **strong**  **tool**  **weak** Materials for purpose **material**  **purpose** Mechanisms and movement **axle**  **chassis**  **connect**  **move**  **roll**  **wheel** Significant people **product**  **taxi**  **transport**  **vehicle** | **core knowledge** Design criteria are the explicit goals that a project must achieve. | **Y1** **skill** **1** Create a design to meet simple design criteria. |
| **core knowledge** Design criteria are the explicit goals that a project must achieve. | **Y1** **skill** **1** Create a design to meet simple design criteria. |
| **core knowledge** Two products can be compared by looking at a set of criteria and scoring both products against each one.  **specific knowledge** Axles and wheels can be attached to chassis in different ways: an axle fixed to a chassis has freely moving wheels, whereas a freely moving axle has fixed wheels.  **core knowledge** Everyday products are objects that are used routinely at home and school, such as a toothbrush, cup or pencil. All products are designed for a specific purpose.  **specific knowledge** A wheel is a circular object that is connected to an axle that makes vehicles and machines move. 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. | **Y1** **skill** **1** Describe the similarities and differences between two products.  **Y1** **skill** **1** Name and explore a range of everyday products and describe how they are used. |
| **core knowledge** A strength is a good quality of a piece of work. A weakness is an area that could be improved. | **Y1** **skill** **1** Talk about their own and each other's work, identifying strengths or weaknesses and offering support. |
| **core knowledge** An axle is a rod or spindle that passes through the centre of a wheel to connect two wheels.  **specific knowledge** Most vehicles that move on land have axles and wheels that are fixed to a chassis. | **Y1** **skill** **2** Use wheels and axles to make a simple moving model. |
| **core 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. | **Y1** **skill** **1** Construct simple structures, models or other products using a range of materials. |
| Year 1  Chop, Slice and Mash – DT Focus    Key Concepts:  **Evaluation**  **Food prep & cooking**  **Generation of ideas**  **Investigation**  **Nutrition**  **Origins of food**  **Significant people**  8 Programmes of study, 9 skills and 10 knowledge statements  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.  Select from and use a range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing).  Explore and evaluate a range of existing products.  Evaluate their ideas and products against design criteria.  Use the basic principles of a healthy and varied diet to prepare dishes.  Understand where food comes from.  Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world. | Evaluation **evaluate**  **evaluation**  **improve**  **success** | **core knowledge** Design criteria are the explicit goals that a project must achieve. | **Y1** **skill** **1** Create a design to meet simple design criteria. |
| **core knowledge** Design criteria are the explicit goals that a project must achieve. | **Y1** **skill** **1** Create a design to meet simple design criteria. |
| Generation of ideas  **design**  **design criteria**  **diagram**  **label** | **core knowledge** Specific tools are used for particular purposes. For example, scissors are used for cutting and glue is used for sticking.  **specific knowledge** Knives are used for slicing and chopping, a grater is used for grating, a vegetable peeler is used for peeling and a masher is used for crushing. | **Y1** **skill** **1** Select the appropriate tool for a simple practical task. |
| Staying safe **hygiene**  **rule**  **safety** | **core knowledge** The importance of a product may be that it fulfils its goals and performs a useful purpose. | **Y1** **skill** **1** Describe why a product is important. |
| Investigation  **chop**  **grate**  **grater**  **knife**  **mash**  **masher**  **peel**  **peeler**  **slice**  **tear** Nutrition **flavour**  **fruit**  **healthy**  **ingredient**  **salad**  **vegetable** Origins of food **animal**  **dairy product**  **fish**  **flower**  **fruit**  **leaf**  **meat**  **nut**  **plant**  **root**  **seed**  **source**  **stem** | **core knowledge** A strength is a good quality of a piece of work. A weakness is an area that could be improved. | **Y1** **skill** **1** Talk about their own and each other's work, identifying strengths or weaknesses and offering support. |
| **core knowledge** Using non-standard measures is a way of measuring that does not involve reading scales. For example, weight may be measured using a balance scale and lumps of plasticine. Length may be measured in the number of handspans or pencils laid end to end.  **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.  **specific knowledge** Fruits and vegetables can be mixed to make a healthy salad. Salad dressings can improve the flavour of salads. | **Y1** **skill** **1** Measure and weigh food items using non-standard measures, such as spoons and cups.  **Y1** **skill** **1** Select healthy ingredients for a fruit or vegetable salad. |
| **core knowledge** Some foods come from animals, such as meat, fish and dairy products. Other foods come from plants, such as fruit, vegetables, grains, beans and nuts. | **Y1** **skill** **1** Sort foods into groups by whether they are from an animal or plant source. |
| **core knowledge** Rules are made to keep people safe from danger. Safety rules include always listening carefully and following instructions, using equipment only as and when directed, wearing protective clothing if appropriate and washing hands before touching food. | **Y1** **skill** **1** Follow the rules to keep safe during a practical task. |
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| Year 3  Cook well, eat well – DT focus  Key Concepts:  **Valuation**  **Food prep & cooking**  **Generation of ideas**  **Nutrition**  **Origins of food**  **Significant people**  **Staying safe**  8 Programmes of study, 8 skills and 12 knowledge statements | **Y3**  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. | **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.  **specific knowledge**Tacos are a traditional Mexican street food made from wheat or corn tortillas, filled with a meat or vegetarian filling and topped with salsa, lettuce or cheese. | **Y3** **skill** **1** Develop design criteria to inform a design. |
| **Y3**  Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided 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.  **specific knowledge**Tacos are a traditional Mexican street food made from wheat or corn tortillas, filled with a meat or vegetarian filling and topped with salsa, lettuce or cheese. | **Y3** **skill** **1** Develop design criteria to inform a design. |
| **Y3**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **core knowledge**Asking questions can help others to evaluate their products, such as asking them whether the selected materials achieved the purpose of the model. | **Y3** **skill** **1** Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account. |
| **Y3**  Understand how key events and individuals in design and technology have helped shape the world. | **core knowledge**Key inventions in design and technology have changed the way people live. | **Y3** **skill** **1** Describe how key events in design and technology have shaped the world. |
| **Y3**  Understand and apply the principles of a healthy and varied diet. | **core knowledge**There are five main food groups that should be eaten regularly as part of a balanced diet: 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. | **Y3** **skill** **1** Identify the main food groups (carbohydrates, protein, dairy, fruits and vegetables, fats and sugars). |
| **Y3**  Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. | **core knowledge**Preparation techniques for savoury dishes include peeling, chopping, deseeding, slicing, dicing, grating, mixing and skinning.  **specific knowledge**Food can be cooked by boiling, steaming or frying on a hob; baking or roasting in an oven; grilling under a grill or on a barbecue; microwaving or cooked slowly in a slow cooker.  **specific knowledge**Potatoes can be cooked in different ways. Some methods are less healthy due to the addition of oil.  **specific knowledge**Slow cookers cook food on a low heat over several hours.  **specific knowledge**Ratatouille is a vegetarian dish made from onions, aubergines, courgettes, peppers and tomatoes. | **Y3** **skill** **5** Prepare and cook a simple savoury dish. |
| **Y3**  Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. | **core 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. | **Y3** **skill** **1** Identify and name foods that are produced in different places. |
| **Y3**  Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world. | **core knowledge**Electrical appliances must only be used under the supervision of an adult. Safety rules must also 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. | **Y3** **skill** **1** Use appliances safely with adult supervision. |
| Year 3  Making it move – DT focus  Key Concepts:  **Evaluation**  **Everyday products**  **Generation of ideas**  **Investigation**  **Materials for purpose**  **Mechanisms & movement**  7 Programmes of study, 7 skills and 9 knowledge statements | **Y3**  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. | **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.  **specific knowledge**Automata are machines that seem to move on their own and are intended to intrigue and delight an audience. | **Y3** **skill** **1** Develop design criteria to inform a design. |
| **Y3**  Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided 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.  **specific knowledge**Automata are machines that seem to move on their own and are intended to intrigue and delight an audience. | **Y3** **skill** **1** Develop design criteria to inform a design. |
| **Y3**  Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately. | **core 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. | **Y3** **skill** **1** Use tools safely for cutting and joining materials and components. |
| **Y3**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **core knowledge**Materials for a specific task must be selected on the basis of their properties. These include physical properties as well as availability and cost. | **Y3** **skill** **1** Plan which materials will be needed for a task and explain why. |
| **Y3**  Investigate and analyse a range of existing products. | **core knowledge**Particular products have been designed for specific tasks, such as nail clippers, the spinning top and the cool box. | **Y3** **skill** **1** Explain how an existing product benefits the user. |
| **Y3**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **core knowledge**Asking questions can help others to evaluate their products, such as asking them whether the selected materials achieved the purpose of the model. | **Y3** **skill** **1** Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account. |
| **Y3**  Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages). | **core knowledge**Levers consist of a rigid bar that rotates around a fixed point, called a fulcrum. They reduce the amount of work needed to lift a heavy object. Sliders move from side to side or up and down, and are often used to make moving parts in books. Axles are shafts on which wheels can rotate to make a moving vehicle. Cams are devices that can convert circular motion into up-and-down motion.  **specific knowledge**Cam mechanisms consist of an axle, a cam and a follower. 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. Cams are used in many machines. In engines, cams open and close valves. They can also be used to make carousel horses move up and down.  **specific knowledge**Different shaped cams produce different patterns of movement in the follower. A pear cam makes the follower stationary for half a turn, then it gently rises and falls. It is used for carousel horses. An off-centre circular cam produces a smooth, continuous up and down movement. It is used for steam engine pistons. A heart cam makes a jerky, irregular up and down movement. A snail cam makes the follower stationary for half a turn, then gently rise and quickly fall. | **Y3** **skill** **3** Explore and use a range of mechanisms (levers, sliders, axles, wheels and cams) in models or products. |
| Year 3  Beautiful Botanicals – Art focus  Key Concepts:  **Cut and join**  **Decorating textiles**  2 Programmes of study, 2 skills and 2 knowledge statements | **Y3**  Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately. | **core knowledge**A loom is a piece of equipment that is used for making fabric by weaving wool or thread. Weaving involves interlacing pieces of thread or yarn. | **Y3** **skill** **1** Cut and join wools, threads and other materials to a loom. |
| **Y3** **skill** **1** Cut and join wools, threads and other materials to a loom. | **core 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. | **Y3** **skill** **1** Decorate a loom weaving using embellishments, such as natural or silk flowers, tassels and bows. |
| Year 3  Greenhouse – DT focus  Key Concepts:  **Compare and contrast**  **Evaluation**  **Everyday products**  **Generation of ideas**  **Investigation**  **Materials for purpose**  **Structures**  8 Programmes of study, 8 skills and 12 knowledge statements | **Y3**  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. | **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. | **Y3** **skill** **1** Develop design criteria to inform a design. |
| **Y3**  Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided 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. | **Y3** **skill** **1** Develop design criteria to inform a design. |
| **Y3**  Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately. | **core 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.  **specific knowledge**A hot glue gun can join materials, including wood, some plastics, metal, fabric and paper. The advantages of a hot glue gun are that it allows glue to go onto a surface smoothly, the user can direct the glue to exactly where it is needed, and the glue hardens quickly. Safety rules must be followed to prevent burns. | **Y3** **skill** **2** Use tools safely for cutting and joining materials and components. |
| **Y3**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **core knowledge**Materials for a specific task must be selected on the basis of their properties. These include physical properties as well as availability and cost.  **specific knowledge**Materials, such as glass and plastic are suitable for making greenhouse roofs and walls because they are transparent, waterproof and hardwearing. | **Y3** **skill** **1** Plan which materials will be needed for a task and explain why. |
| **Y3**  Investigate and analyse a range of existing products. | **core knowledge**Particular products have been designed for specific tasks, such as nail clippers, the spinning top and the cool box.  **specific knowledge**A greenhouse is a building where plants can grow in a warm and protected environment. Greenhouses let light in through transparent or translucent walls and roofs. Windows, vents or fans provide ventilation. | **Y3** **skill** **1** Explain how an existing product benefits the user. |
| **Y3**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **core knowledge**Asking questions can help others to evaluate their products, such as asking them whether the selected materials achieved the purpose of the model. | **Y3** **skill** **1** Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account. |
| **Y3**  Understand how key events and individuals in design and technology have helped shape the world. | **core knowledge**Work from different designers can be compared by assessing specific criteria, such as their visual impact, fitness for purpose and target market.  **specific knowledge**There are similarities and differences between the Great Conservatory of Chatsworth House and the Eden Project biomes. Both greenhouses were built to house tropical plants and have a frame structure. However, the frameworks are made of different materials and the greenhouses are heated in different ways. | **Y3** **skill** **1** Explain the similarities and difference between the work of two designers. |
| **Y3**  Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. | **core knowledge**Shell structures are hollow, 3-D structures with a thin outer covering, such as a box. Frame structures are made from thin, rigid components, such as a tent frame. The rigid frame gives the structure shape and support. Diagonal struts can strengthen the structure.  **specific knowledge**Diagonal struts create triangular shapes within a frame structure. Adding diagonal struts adds strength and stability. | **Y3** **skill** **1** Create shell or frame structures using diagonal struts to strengthen them. |
| Year 4  Fresh food, good food  Key Concepts:  **Evaluation**  **Everyday products**  **Food prep & cooking**  **Generation of ideas**  **Materials for purpose**  **Nutrition**  **Origins of food**  **Significant people**  **Staying safe**  **Structures**  11 Programmes of study, 11 skills and 16 knowledge statements | **Y4**  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. | **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. | **Y4** **skill** **1** Use annotated sketches and exploded diagrams to test and communicate their ideas. |
| **Y4**  Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. | **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. | **Y4** **skill** **1** Use annotated sketches and exploded diagrams to test and communicate their ideas. |
| **Y4**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **core knowledge**Different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. Recipe ingredients have different tastes and appearances. They look and taste better and are cheaper when in season. | **Y4** **skill** **1** Choose from a range of materials, showing an understanding of their different characteristics. |
| **Y4**  Investigate and analyse a range of existing products. | **core knowledge**Design features are the aspects of a product's design that the designer would like to emphasise, such as the use of a particular material or feature that makes the product easier to use or more durable.  **specific knowledge**Food packaging provides physical protection for foods and can prevent contamination from microorganisms.  **specific knowledge**Materials, including plastic, paper, cardboard, foil and metal, can be used to package food. Some types of packaging, such as tin cans, can significantly extend the shelf life of some foods. Some packaging is more environmentally friendly than others. | **Y4** **skill** **3** Investigate and identify the design features of a familiar product. |
| **Y4**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **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. Evaluation also includes suggesting improvements and explaining why they should be made. | **Y4** **skill** **1** 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. |
| **Y4**  Understand how key events and individuals in design and technology have helped shape the world. | **core knowledge**Significant designers and inventors can shape the world.  **specific knowledge**Food deteriorates due to the growth of microorganisms. Decay can be prevented or delayed by preservation methods, such as drying, salting, pickling, canning, pasteurising, refrigerating or freezing the food.  **specific knowledge**Food packaging plays an important role in keeping foods fresh. 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. | **Y4** **skill** **3** Explain how and why a significant designer or inventor shaped the world. |
| **Y4**  Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. | **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. Shell and frame structures can be strengthened by gluing several layers of card together, using triangular shapes rather than squares, adding diagonal support struts and using 'Jinks' corners (small, thin pieces of card cut into a right-angled triangle and glued over each joint to straighten and strengthen them).  **specific knowledge**Most cardboard packaging is produced from a net. Packages can be strengthened by using thicker cardboard or multiple layers. | **Y4** **skill** **1** Prototype shell and frame structures, showing awareness of how to strengthen, stiffen and reinforce them. |
| **Y4**  Understand and apply the principles of a healthy and varied diet. | **core knowledge**Healthy snacks include fresh or dried fruit and vegetables, nuts and seeds, rice cakes with low-fat cream cheese, homemade popcorn or chopped vegetables with hummus. A healthy packed lunch might include a brown or wholemeal bread sandwich containing eggs, meat, fish or cheese, a piece of fresh fruit, a low-sugar yoghurt, rice cake or popcorn and a drink, such as water or semi-skimmed milk.  **specific 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, ‘use by’ and ‘best before’ dates, and the materials and recyclability of the packaging. | **Y4** **skill** **2** Design a healthy snack or packed lunch and explain why it is healthy. |
| **Y4**  Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. | **core knowledge**Cooking techniques include baking, boiling, frying, grilling and roasting. | **Y4** **skill** **1** Identify and use a range of cooking techniques to prepare a simple meal or snack |
| **Y4**  Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. | **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. | **Y4** **skill** **1** Identify and name foods that are produced in different places in the UK and beyond. |
| **Y4**  Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world. | **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. Most chemical products carry a hazard symbol showing in what way the chemical could be harmful. Chemicals should only be used under adult supervision. Appropriate safety precautions, such as wearing goggles and gloves, working in a well-ventilated room, wiping up spills and tying back long hair, should be taken. | **Y4** **skill** **1** Work safely with everyday chemical products under supervision, such as disinfectant hand wash and surface cleaning spray. |
| Year 4  Warp and Weft – Art focus  Key concepts:  **Materials for purpose**  1 Programme of study, 1 skills and 2 knowledge statements | **Y4**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **core knowledge**Different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. Recipe ingredients have different tastes and appearances. They look and taste better and are cheaper when in season.  **specific knowledge**Visual elements of yarn include the colour, appearance, shape, texture, elasticity and type. | **Y4** **skill** **1** Choose from a range of materials, showing an understanding of their different characteristics. |
| Year 4  **Misty Mountain, Winding River -** Geography focus  Key Concepts:  **Everyday products**  **Materials for purpose**  2 Programmes of study, 2 skills and 2 knowledge statements | **Y4**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **core knowledge**Different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. Recipe ingredients have different tastes and appearances. They look and taste better and are cheaper when in season. | **Y4** **skill** **1** Choose from a range of materials, showing an understanding of their different characteristics. |
| **Y4**  Investigate and analyse a range of existing products. | **core knowledge**Design features are the aspects of a product's design that the designer would like to emphasise, such as the use of a particular material or feature that makes the product easier to use or more durable. | **Y4** **skill** **1** Investigate and identify the design features of a familiar product. |
| Year 4  **Functional and Fancy Fabrics – art focus**  **Key Concepts:**  **Compare and contrast**  **Cut and join**  **Decorating textiles**  **Evaluation**  **Everyday products**  **Generation of ideas**  **Investigation**  **Materials for purpose**  **Significant people**  7 Programmes of study, 10 skills and 14 knowledge statements | **Y4**  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. | **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.  **specific 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. | **Y4** **skill** **1** Use annotated sketches and exploded diagrams to test and communicate their ideas. |
| **Y4**  Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. | **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.  **specific 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. | **Y4** **skill** **1** Use annotated sketches and exploded diagrams to test and communicate their ideas. |
| **Y4**  Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately. | **core knowledge**Useful tools for cutting include scissors, 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.  **specific knowledge**Joining tools to use with fabric include needles, pins and clips, cutting tools include a variety of scissors such as pinking shears, finishing tools include an iron and ironing board.  **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. | **Y4** **skill** **1** Select, name and use tools with adult supervision.  **Y4** **skill** **1** Hand sew a hem or seam using a running stitch. |
| **Y4**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **core knowledge**Different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. Recipe ingredients have different tastes and appearances. They look and taste better and are cheaper when in season.  **specific knowledge**Fabrics can be natural or synthetic. Natural fabrics include cotton, silk and wool. Synthetic fabrics include Lycra, polyester and nylon.  **core knowledge**Block printing techniques and fabric paint are used to create decorative, repeated patterns on fabrics. | **Y4** **skill** **1** Choose from a range of materials, showing an understanding of their different characteristics.  **Y4** **skill** **1** Create detailed decorative patterns on fabric using printing techniques. |
| **Y4**  Investigate and analyse a range of existing products. | **core knowledge**A comparison table can be used to compare products by listing specific criteria on which each product can be judged or scored.  **core knowledge**Design features are the aspects of a product's design that the designer would like to emphasise, such as the use of a particular material or feature that makes the product easier to use or more durable.  **specific knowledge**Design features include purpose and function, appearance, quality, material, size, colour, pattern, embellishment, durability and usability. | **Y4** **skill** **1** Create and complete a comparison table to compare two or more products.  **Y4** **skill** **1** Investigate and identify the design features of a familiar product. |
| **Y4**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **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. Evaluation also includes suggesting improvements and explaining why they should be made. | **Y4** **skill** **1** 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. |
| **Y4**  Understand how key events and individuals in design and technology have helped shape the world. | **core knowledge**Significant designers and inventors can shape the world.  **specific knowledge**William Morris was a British textile designer, artist and socialist activist associated with the British Arts and Crafts Movement. He was a significant contributor to the revival of traditional British textile arts and methods of production. | **Y4** **skill** **1** Explain how and why a significant designer or inventor shaped the world. |
| Year 4  Electrical circuits and conductors – science focus  Key concepts:  **Compare and contrast**  **Electricity**  **Evaluation**  **Everyday products**  **Generation of ideas**  **Use of ICT**  6 Programmes of study, 7 skills and 9 knowledge statements | **Y4**  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. | **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. | **Y4** **skill** **1** Use annotated sketches and exploded diagrams to test and communicate their ideas. |
| **Y4**  Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. | **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. | **Y4** **skill** **1** Use annotated sketches and exploded diagrams to test and communicate their ideas. |
| **Y4**  Investigate and analyse a range of existing products. | **core knowledge**A comparison table can be used to compare products by listing specific criteria on which each product can be judged or scored.  **core knowledge**Design features are the aspects of a product's design that the designer would like to emphasise, such as the use of a particular material or feature that makes the product easier to use or more durable.  **specific knowledge**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.  **specific knowledge**A programmable device is a machine that is able to be provided with coded instructions for the automatic performance of a task.  **specific knowledge**A nightlight is a small electric light that gives out a dim glow. Design features of nightlights include a switch, light source and an attractive casing. | **Y4** **skill** **1** Create and complete a comparison table to compare two or more products.  **Y4** **skill** **3** Investigate and identify the design features of a familiar product. |
| **Y4**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **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. Evaluation also includes suggesting improvements and explaining why they should be made. | **Y4** **skill** **1** 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. |
| **Y4**  Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors). | **core 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. | **Y4** **skill** **1** Incorporate circuits that use a variety of components into models or products. |
| **Y4**  Apply their understanding of computing to program, monitor and control their products. | **core knowledge**Remote control is controlling a machine or activity from a distance. Computers can be used to remotely control a device, such as a light, speaker or buzzer. | **Y4** **skill** **1** Write a program to control a physical device, such as a light, speaker or buzzer. |
| Year 4  Tomb Builders  Key concepts:  **Evaluation**  **Materials for purpose**  **Mechanisms & movement**  3 Programmes of study, 3 skills and 7 knowledge statements | **Y4**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **core knowledge**Different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. Recipe ingredients have different tastes and appearances. They look and taste better and are cheaper when in season.  **specific knowledge**Characteristics of materials, such as rigidity, strength and smoothness will affect the success of a working model. | **Y4** **skill** **1** Choose from a range of materials, showing an understanding of their different characteristics. |
| **Y4**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **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. Evaluation also includes suggesting improvements and explaining why they should be made. | **Y4** **skill** **1** 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. |
|  | **Y4**  Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages). | **core knowledge**Mechanisms can be used to add functionality to a model. For example, sliders or levers can be used in moving pictures, storybooks or simple puppets; linkages in moving vehicles or puppets; gears in motorised vehicles or spinning toys; pulleys in cable cars or transport systems and cams in 3-D moving toys or pictures.  **specific 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.  **specific knowledge**Simple machines make physical jobs easier by changing the strength or direction of a force.  **specific knowledge**Simple machines including pulleys, levers, wheels and axles and inclined planes can be combined to make a machine that can move heavy objects | **Y4** **skill** **3** Explore and use a range of mechanisms (levers, axles, cams, gears and pulleys) in models or products. |
| Year 5  Moving mechanisms – DT focus  Key concepts:  **Compare and contrast**  **Evaluation**  **Everyday products**  **Investigation**  **Materials for purpose**  **Mechanisms & movement**  **Staying safe**  **Structures**  7 Programmes of study, 8 skills and 13 knowledge statements | **Y5**  Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately. | **core knowledge**There are many rules for using tools safely and these may vary depending on the tools being used. For example, someone using a chisel should chip or cut with the cutting 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. | **Y5** **skill** **1** Name and select increasingly appropriate tools for a task and use them safely. |
| **Y5**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **core 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. | **Y5** **skill** **1** Select and combine materials with precision. |
| **Y5**  Investigate and analyse a range of existing products. | **core knowledge**Culture is the language, inventions, ideas and art of a group of people. A society is all the people in a community or group. Culture affects the design of some products. For example, knives and forks are used in the western world, whereas chopsticks are used mainly in China and Japan. The design of products needs to take into account the culture of the target audience. For example, colours might mean very different things in different cultures. | **Y5** **skill** **1** Explain how the design of a product has been influenced by the culture or society in which it was designed or made. |
| **Y5**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **core knowledge**A focus group is a small group of people whose reactions and opinions about a product are taken and studied. Evaluations can be made by asking product users a selection of questions to obtain data on how the product has met its design criteria.  **core knowledge**Testing a product against the design criteria will highlight anything that needs improvement or redesign. Changes are often made to a design during manufacture.  **specific knowledge**Design is an iterative process, meaning that once an initial prototype has been designed it is continually tested and improved until the final product is deployed. | **Y5** **skill** **1** Survey users in a range of focus groups and compare results.  **Y5** **skill** **2** Test and evaluate products against a detailed design specification and make adaptations as they develop the product. |
| **Y5**  Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. | **core knowledge**Various methods can be used to support a framework. These include cross braces, guy ropes and diagonal struts. Frameworks can be built using lolly sticks, skewers and bamboo canes.  **specific knowledge**Different mechanisms and systems can work together to perform a function. A strong and stable structure is necessary to support different mechanisms in a machine. | **Y5** **skill** **1** Build a framework using a range of materials to support mechanisms. |
| **Y5**  Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages). | **core knowledge**Pneumatic systems use energy that is stored in compressed air to do work, such as inflating a balloon to open a model monster's mouth. These effects can be achieved using syringes and plastic tubing.  **specific knowledge**A pneumatic system uses air to exert a force. This force is used in pneumatic jacks to lift vehicles, in paint sprayers to force paint out at high speed, in jackhammers to break up pavements and in train and bus brakes.  **specific knowledge**Pneumatic systems are low maintenance, compact and safe as only air can leak from the system.  **specific knowledge**Pneumatic systems can be used to lift heavy loads, raise and lower platforms or soften a force by acting as a shock absorber. | **Y5** **skill** **4** Use mechanical systems in their products, such as pneumatics. |
| **Y5**  Critique, evaluate and test their ideas and products and the work of others. | **core 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. | **Y5** **skill** **1** Explain the functionality and purpose of safety features on a range of products. |
| Year 5  Sow, grow and farm – geography focus  Key concepts:  **Origins of food**  1 Programme of study, 1 skills and 1 knowledge statement | **Y5**  Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. | **core knowledge**Seasonality is the time of year when the harvest or flavour of a type of food is at its best. Buying seasonal food is beneficial for many reasons: the food tastes better; it is fresher because it hasn't been transported thousands of miles; the nutritional value is higher; the carbon footprint is lower, due to reduced transport; it supports local growers and is usually cheaper. | **Y5** **skill** **1** Describe what seasonality means and explain some of the reasons why it is beneficial. |
| Year 5  Eat the seasons – DT focus  Key concepts:  **Food prep & cooking**  **Nutrition**  **Origins of food**  3 Programmes of study, 3 skills and 7 knowledge statements | **Y5**  Understand and apply the principles of a healthy and varied 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. | **Y5** **skill** **1** Evaluate meals and consider if they contribute towards a balanced diet. |
| **Y5**  Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. | **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.  **specific knowledge**Food hygiene is important to prevent the spread of disease-causing microorganisms.  **specific knowledge**Foods can be prepared and cooked in different ways to achieve different results. | **Y5** **skill** **3** Use an increasing range of preparation and cooking techniques to cook a sweet or savoury dish. |
| **Y5**  Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. | **core knowledge**Seasonality is the time of year when the harvest or flavour of a type of food is at its best. Buying seasonal food is beneficial for many reasons: the food tastes better; it is fresher because it hasn't been transported thousands of miles; the nutritional value is higher; the carbon footprint is lower, due to reduced transport; it supports local growers and is usually cheaper.  **specific knowledge**Food hygiene is important to prevent the spread of disease-causing microorganisms.  **specific knowledge**Foods can be prepared and cooked in different ways to achieve different results. | **Y5** **skill** **2** Describe what seasonality means and explain some of the reasons why it is beneficial. |
| Year 5  Properties and changes of materials – science focus  Key concepts:  **Electricity**  1 Programme of study, 1 skills and 1 knowledge statement | **Y5**  Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors). | **core 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. | **Y5** **skill** **1** Use electrical circuits of increasing complexity in their models or products, showing an understanding of control. |
| Year 5  Mixed Media – Art  Key concepts:  **Cut and join**  **Decorating textiles**  2 Programmes of study, 2 skills and 2 knowledge statements | **Y5**  Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately. | **core knowledge**Applique is a technique where pieces of material are attached to another material by stitching or gluing. | **Y5** **skill** **1** Use applique to add decoration to a product or artwork. |
| **Y5**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **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. | **Y5** **skill** **1** Combine stitches and fabrics with imagination to create a mixed media collage. |
| Year 5  Architecture – DT focus  Key concepts:  **Evaluation**  **Everyday products**  **Generation of ideas**  **Materials for purpose**  **Significant people**  **Structures**  7 Programmes of study, 7 skills and 10 knowledge statements | **Y5**  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. | **core knowledge**A pattern piece is a drawing or shape used to guide how to make something. There are many different computer-aided design packages for designing products.  **specific knowledge**Computer-aided design (CAD) is the use of specialised computer software to design objects. CAD can help designers to create better quality, clearer designs and make changes easily. CAD designs can also be made into objects using 3-D printers. | **Y5** **skill** **1** Use pattern pieces and computer-aided design packages to design a product. |
| **Y5**  Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. | **core knowledge**A pattern piece is a drawing or shape used to guide how to make something. There are many different computer-aided design packages for designing products.  **specific knowledge**Computer-aided design (CAD) is the use of specialised computer software to design objects. CAD can help designers to create better quality, clearer designs and make changes easily. CAD designs can also be made into objects using 3-D printers. | **Y5** **skill** **1** Use pattern pieces and computer-aided design packages to design a product. |
| **Y5**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **core 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. | **Y5** **skill** **1** Select and combine materials with precision. |
| **Y5**  Investigate and analyse a range of existing products. | **core knowledge**Culture is the language, inventions, ideas and art of a group of people. A society is all the people in a community or group. Culture affects the design of some products. For example, knives and forks are used in the western world, whereas chopsticks are used mainly in China and Japan. The design of products needs to take into account the culture of the target audience. For example, colours might mean very different things in different cultures.  **specific knowledge**Architecture styles and technology have changed over time. Key periods include Classical architecture with the use of columns, order and symmetry, Gothic architecture, with more delicate stonework, large windows and flying buttresses, and modern architecture, where function is more important than form or attractiveness.  **specific knowledge**The ancient Greeks developed the Classical form of architecture. They used columns to support roofs, which had three main orders; Doric, Ionic and Corinthian. Ancient Greek buildings were symmetrical and beautiful. Roofs had a triangular shaped part, called the pediment, and a wide horizontal part, usually decorated with a frieze, called the entablature. Greek buildings were usually made from limestone or marble. | **Y5** **skill** **3** Explain how the design of a product has been influenced by the culture or society in which it was designed or made. |
| **Y5**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **core knowledge**Testing a product against the design criteria will highlight anything that needs improvement or redesign. Changes are often made to a design during manufacture. | **Y5** **skill** **1** Test and evaluate products against a detailed design specification and make adaptations as they develop the product. |
| **Y5**  Understand how key events and individuals in design and technology have helped shape the world. | **core knowledge**Many new designs and inventions influenced society. For example, labour-saving devices in the home reduced the amount of housework, which was traditionally done by women. This enabled them to have jobs. | **Y5** **skill** **1** Describe the social influence of a significant designer or inventor. |
| **Y5**  Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. | **core knowledge**Various methods can be used to support a framework. These include cross braces, guy ropes and diagonal struts. Frameworks can be built using lolly sticks, skewers and bamboo canes.  **specific knowledge**Support, stiffness and stability can be created by using triangular shapes to create strong frameworks, columns to support roofs and overlapping brickwork patterns. | **Y5** **skill** **2** Build a framework using a range of materials to support mechanisms. |
| Year 6  Food for life – DT focus  Key Concepts:  **Compare and contrast**  **Evaluation**  **Everyday products**  **Food prep & cooking**  **Nutrition**  **Origins of food**  5 Programmes of study, 6 skills and 12 knowledge statements | **Y6**  Investigate and analyse a range of existing products. | **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.  **specific knowledge**Sliced bread is processed. It can contain many more ingredients than homemade bread, including preservatives and artificial ingredients.  **specific knowledge**Yeast is a leavening agent that makes bread rise. Kneading is a technique used to make bread dough. Proving means to leave bread dough, which contains yeast, to rise.  **core knowledge**People's lives have been improved in countless ways due to new inventions and designs. For example, the Morrison shelter, designed by John Baker in 1941, was an indoor air-raid shelter used in over half a million homes during the Second World War. It saved the lives of many people caught in bombing raids.  **specific knowledge**A processed food is changed during preparation and includes processes, such as cooking, freezing, pasteurising, or the addition of ingredients. Pros of processed foods include convenience and availability. Cons include a lack of nutrients and unhealthy ingredients.**specific knowledge**There are different categories of processed foods. Ultra-processed foods have been through significant changes, have added ingredients and often a low nutritional value. | **Y6** **skill** **3** Create a detailed comparative report about two or more products or inventions.  **Y6** **skill** **2** Analyse how an invention or product has significantly changed or improved people's lives. |
| **Y6**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **core knowledge**Design is an iterative process, meaning alterations and improvements are made continually throughout the manufacturing process. Evaluating a product while it's being manufactured, and explaining these evaluations to others, can help to refine it. | **Y6** **skill** **1** Demonstrate modifications made to a product as a result of ongoing evaluation by themselves and to others |
| **Y6**  Understand and apply the principles of a healthy and varied diet. | **core knowledge**Eating a balanced diet is a positive lifestyle choice that should be sustained over time. Food that is high in fat, salt or sugar can still be eaten occasionally as part of a balanced diet. | **Y6** **skill** **1** Plan a healthy daily diet, justifying why each meal contributes towards a balanced diet. |
| **Y6**  Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. | **core knowledge**Ingredients can usually be bought at supermarkets, but specialist shops may stock different items. 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.  **specific knowledge**A recipe provides information to prepare a dish, including ingredients, quantities and a method. They may also contain nutritional information.  **specific knowledge**Techniques include preparation techniques, such as chopping, slicing, dicing, kneading and mashing, and cooking techniques, such as boiling, roasting, frying and baking. | **Y6** **skill** **3** Follow a recipe that requires a variety of techniques and source the necessary ingredients independently. |
|  | **Y6**  Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. | **core knowledge**Organic produce is food that has been grown without the use of man-made fertilisers, pesticides, growth regulators or animal feed additives. Organic farmers use crop rotation, animal and plant manures, hand-weeding and biological pest control. | **Y6** **skill** **1** Explain how organic produce is grown. |
| Year 6  **Electrical Circuits and Components -** Science focus  Key concepts:  **Electricity**  **Evaluation**  **Generation of ideas**  **Staying safe**  **Use of ICT**  6 Programmes of study, 7 skills and 7 knowledge statements | **Y6**  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. | **core knowledge**Design criteria should cover the intended use of the product, age range targeted and final appearance. 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. | **Y6** **skill** **1** Develop design criteria for a functional and appealing product that is fit for purpose, communicating ideas clearly in a range of ways. |
| **Y6**  Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. | **core knowledge**Design criteria should cover the intended use of the product, age range targeted and final appearance. 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 | **Y6** **skill** **1** Develop design criteria for a functional and appealing product that is fit for purpose, communicating ideas clearly in a range of ways. |
| **Y6**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **core knowledge**Design is an iterative process, meaning alterations and improvements are made continually throughout the manufacturing process. Evaluating a product while it's being manufactured, and explaining these evaluations to others, can help to refine it. | **Y6** **skill** **1** Demonstrate modifications made to a product as a result of ongoing evaluation by themselves and to others. |
| **Y6**  Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors). | **core knowledge**Computer programs can control electrical circuits that include a variety of components, such as switches, lamps, buzzers and motors. | **Y6** **skill** **1** Understand and use electrical circuits that incorporate a variety of components (switches, lamps, buzzers and motors) and use programming to control their products. |
| **Y6**  Apply their understanding of computing to program, monitor and control their products. | **core knowledge**Computer monitoring uses sensors as a scientific tool to record information about environmental changes over time. Computer monitoring can also log data from sensors and record the resulting information in a table or graph.  **specific 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.  **specific knowledge**Micro:bit can be programmed to switch on an LED in a circuit when light level falls below a certain value.  **core knowledge**Computer programs can control electrical circuits that include a variety of components, such as switches, lamps, buzzers and motors. | **Y6** **skill** **3** Use a sensor to monitor an environmental variable, such as temperature, sound or light.  **Y6** **skill** **1** Understand and use electrical circuits that incorporate a variety of components (switches, lamps, buzzers and motors) and use programming to control their products. |
| **Y6**  Critique, evaluate and test their ideas and products and the work of others. | **core knowledge**The safety of the user has to be taken into account when designing a new product. Methods to help keep users safe include providing clear instructions for use; clear indication of the age range for which it is designed; safety features (such as child-resistant packaging); warning symbols and electrical safety checks. | **Y6** **skill** **1** Demonstrate how their products take into account the safety of the user. |
| Year 6  Engineer – DT focus  Key concepts:  **Compare and contrast**  **Evaluation**  **Everyday products**  **Generation of ideas**  **Materials for purpose**  **Significant people**  **Structures**  7 Programmes of study, 8 skills and 11 knowledge statements | **Y6**  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. | **core knowledge**Design criteria should cover the intended use of the product, age range targeted and final appearance. 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. | **Y6** **skill** **1** Develop design criteria for a functional and appealing product that is fit for purpose, communicating ideas clearly in a range of ways. |
| **Y6**  Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. | **core knowledge**Design criteria should cover the intended use of the product, age range targeted and final appearance. 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. | **Y6** **skill** **1** Develop design criteria for a functional and appealing product that is fit for purpose, communicating ideas clearly in a range of ways. |
| **Y6**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **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. | **Y6** **skill** **1** Choose the best materials for a task, showing an understanding of their working characteristics. |
| **Y6**  Investigate and analyse a range of existing products. | **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.  **specific knowledge**The four main bridge types are the beam bridge, arch bridge, truss bridge and suspension bridge. They each spread forces in different ways to remain strong and stable.  **core knowledge**People's lives have been improved in countless ways due to new inventions and designs. For example, the Morrison shelter, designed by John Baker in 1941, was an indoor air-raid shelter used in over half a million homes during the Second World War. It saved the lives of many people caught in bombing raids.  **specific knowledge**Bridges provide a safe route over obstacles, including roads and rivers. They are used by pedestrians, cars, trains and pipelines.  **specific knowledge**Bridge structures have changed over time with innovations in design and materials. Significant bridges include the Menai Bridge, Clifton Suspension Bridge and Forth Bridge. | **Y6** **skill** **1** Create a detailed comparative report about two or more products or inventions.  **Y6** **skill** **2** Analyse how an invention or product has significantly changed or improved people's lives. |
| **Y6**  Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. | **core knowledge**Design is an iterative process, meaning alterations and improvements are made continually throughout the manufacturing process. Evaluating a product while it's being manufactured, and explaining these evaluations to others, can help to refine it. | **Y6** **skill** **1** Demonstrate modifications made to a product as a result of ongoing evaluation by themselves and to others. |
| **Y6**  Understand how key events and individuals in design and technology have helped shape the world. | **core knowledge**The significance of a designer or inventor can be measured in various ways. Their work may benefit society in health, transport, communication, education, the built environment or technology. It may enhance culture in different areas, such as fashion, ceramics or computer games. | **Y6** **skill** **1** Present a detailed account of the significance of a favourite designer or inventor. |
| **Y6**  Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. | **core knowledge**Strength can be added to a framework by using multiple layers. For example, corrugated cardboard can be placed with corrugations running alternately vertically and horizontally. Triangular shapes can be used instead of square shapes because they are more rigid. Frameworks can be further strengthened by adding an outer cover.  **specific knowledge**Triangles are a strong shape used by engineers to add strength to a structure. When a force is applied to a triangle, it is distributed down each side, making triangles difficult to distort or collapse. | **Y6** **skill** **2** Select the most appropriate materials and frameworks for different structures, explaining what makes them strong. |
| Year 6  Light theory – science focus  Key concepts:  **Use of ICT**  1 Programme of study, 1 skills and 1 knowledge statement | **Y6**  Apply their understanding of computing to program, monitor and control their products. | **core knowledge**Computer monitoring uses sensors as a scientific tool to record information about environmental changes over time. Computer monitoring can also log data from sensors and record the resulting information in a table or graph. | **Y6** **skill** **1** Use a sensor to monitor an environmental variable, such as temperature, sound or light. |
| Year 6  Make do and mend – DT focus  Key concepts:  **Compare and contrast**  **Cut and join**  **Decorating textiles**  **Everyday products**  **Investigation**  **Materials for purpose**  3 Programmes of study, 6 skills and 11 knowledge statements | **Y6**  Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately. | **core knowledge**Precision is important in producing a polished, finished product. Correct selection of tools and careful measurement can ensure the parts fit together correctly.  **specific knowledge**Deconstructing garments identifies how they were made, the materials used and their properties.  **specific knowledge**Hand stitches include running stitch, blanket stitch and whip stitch.  **core knowledge**Pinning with dressmaker pins and tacking with quick, temporary stitches holds fabric together in preparation for and during sewing. | **Y6** **skill** **2** Select appropriate tools for a task and use them safely and precisely.  **Y6** **skill** **1** Pin and tack fabrics in preparation for sewing and more complex pattern work. |
| **Y6**  Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. | **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.  **specific knowledge**Mrs Sew and Sew was a character promoted by the Make Do and Mend campaign to encourage people to be more efficient and creative with their old clothing.  **core knowledge**Fastenings hold a piece of clothing together. Types of fastenings include zips, press studs, Velcro and buttons. | **Y6** **skill** **2** Choose the best materials for a task, showing an understanding of their working characteristics.  **Y6** **skill** **1** Use different methods of fastening for function and decoration, including press studs, Velcro and buttons. |
| **Y6**  Investigate and analyse a range of existing products. | **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.  **core knowledge**People's lives have been improved in countless ways due to new inventions and designs. For example, the Morrison shelter, designed by John Baker in 1941, was an indoor air-raid shelter used in over half a million homes during the Second World War. It saved the lives of many people caught in bombing raids.  **specific knowledge**In 1941, the British government introduced clothes rationing. This was to limit the amount of labour and materials used in clothes production, so that it could be used to support the greater war effort.  **specific knowledge**Make Do and Mend was a campaign run by the Ministry of Information to encourage people to recycle and repurpose their old clothes rather than buy new. | **Y6** **skill** **1** Create a detailed comparative report about two or more products or inventions.  **Y6** **skill** **2** Analyse how an invention or product has significantly changed or improved people's lives. |