

## Knowledge Progression (including core and specific) Design & Technology

### Year 1

#### Autumn term - Shade and Shelter

**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.

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**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.

**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.

**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.

**core knowledge** A strength is a good quality of a piece of work. A weakness is an area that could be improved.

**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.

**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.

#### Spring term Bright Lights, Big City

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#### Taxi

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**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.

**core knowledge** A strength is a good quality of a piece of work. A weakness is an area that could be improved.

**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.

## **Summer term**

### **Chop, Slice and Mash**

**core knowledge** Design criteria are the explicit goals that a project must achieve.

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**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.

**core knowledge** The importance of a product may be that it fulfils its goals and performs a useful purpose.

**core knowledge** A strength is a good quality of a piece of work. A weakness is an area that could be improved.

**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.

**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.

**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.

## Year 2

### Autumn term

#### Remarkable Recipes

**core knowledge** Ideas can be communicated in a variety of ways, including written work, drawings and diagrams, modelling, speaking and using information and communication technology.

**specific knowledge** A recipe is a set of instructions for preparing and cooking dishes. It is divided into sections, giving information about the dish being prepared, the preparation time, the number it serves, the equipment needed, the ingredients needed and the sequential steps to follow. A recipe may also include a picture.

**specific knowledge** School kitchen staff are important people because they provide healthy, nutritious, appealing and balanced meals.

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**specific knowledge** School kitchen staff are important people because they provide healthy, nutritious, appealing and balanced meals.

**core knowledge** Different tools have characteristics that make them suitable for specific purposes. For example, scissors are used for cutting paper because they have sharp, metal blades that can cut through thin materials.

**core knowledge** Some ingredients need to be prepared before they can be cooked or eaten. There are many ways to prepare ingredients: peeling skins using a vegetable peeler, such as potato skins; grating hard ingredients, such as cheese or chocolate; chopping vegetables, such as onions and peppers and slicing foods, such as bread and apples.

**core knowledge** Many key individuals have helped to shape the world. These include engineers, scientists, designers, inventors and many other people in important roles.

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skins; grating hard ingredients, such as cheese or chocolate; chopping vegetables, such as onions and peppers and slicing foods, such as bread and apples.

**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.

**core knowledge** Food comes from two main sources: animals and plants. Cows provide beef, sheep provide lamb and mutton and pigs provide pork, ham and bacon. Examples of poultry include chickens, geese and turkeys. Examples of fish include cod, salmon and shellfish. Milk comes mainly from cows but also from goats and sheep. Most eggs come from chickens. Honey is made by bees. Fruit and vegetables come from plants. Oils are made from parts of plants. Sugar is made from plants called sugar cane and sugar beet. Plants also give us nuts, such as almonds, walnuts and hazelnuts.

**core knowledge** Hygiene rules include washing hands before handling food, cleaning surfaces, tying long hair back, storing food appropriately and wiping up spills.

## **Spring term**

### **Beach Hut**

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**specific knowledge** Tools for working with wood include a junior hacksaw, for cutting; a bench hook, for supporting the wood and as a guide to cut; and a G clamp, for holding the bench hook and wood securely.

**core knowledge** Properties of components and materials determine how they can and cannot be used. For example, plastic is shiny and strong but it can be difficult to paint.

**core knowledge** Finished products can be compared with design criteria to see how closely they match. Improvements can then be planned.

**core knowledge** Structures can be made stronger, stiffer and more stable by using cardboard rather than paper and triangular shapes rather than squares. A broader base will also make a structure more stable.

## **Summer term**

**Cut, Stitch, Join - TBC**

**Making it Move - TBC**

## Year 3

### Autumn term Cook Well, Eat Well

**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.

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**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.

**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.

**core knowledge** Key inventions in design and technology have changed the way people live.

**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.

**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.

**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.

**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.

### Spring term Push and Pull - TBC

## Summer term Greenhouse - TBC

### Year 4

#### Autumn term Fresh Food, Good Food

**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.

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**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.

**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.

**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.

**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.

**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.

**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.

**core knowledge** Cooking techniques include baking, boiling, frying, grilling and roasting.

**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.

**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.

## **Spring term Functional and Fancy Fabrics - TBC**

### **Summer term Tomb Builders**

**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.

**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.

**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.

## Year 5

### Autumn term Moving Mechanisms

**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.

**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.

**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.

**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.

**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.

**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.

**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.

## **Spring term Eat the Seasons**

**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.

**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.

**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.

## **Summer term Architecture**

**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.

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**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.

**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.

**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.

**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.

## Year 6

### Autumn term Food for Life

**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.

**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.

**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.

**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.

**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.

## **Spring term Engineer - TBC**

### **Summer term Make Do and Mend**

**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.

**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.

**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.