



Knowledge Progression Map: Design and Technology

	Nursery	Reception	Year 1	Year 2
Designing			Design criteria are the explicit goals that a project must achieve.	Ideas can be communicated in a variety of ways, including written work, drawings and diagrams, modelling, speaking and using information and communication technology.
Making	Tools have different purposes. For example, scissors are used for cutting and glue is used for sticking.	Different tools are needed for different tasks. For example, pencils and paper are needed for drawing pictures.	Specific tools are used for particular purposes. For example, scissors are used for cutting and glue is used for sticking.	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.
Evaluating		Recognise that it is possible to change and alter their designs and ideas as they are making them.	A strength is a good quality of a piece of work. A weakness is an area that could be improved.	Finished products can be compared with design criteria to see how closely they match. Improvements can then be planned.
Technical Knowledge	Mechanisms: Vehicles and ride-on toys have wheels to help them move. Electrical systems: Batteries power some objects. A switch turns them off and on.	Mechanisms: Vehicles and machines have wheels and axles to help them move. Electrical systems: Many appliances at home and school need electricity to work. The appliances need to be attached to electricity through a plug and socket, or use batteries.	Mechanisms: An axle is a rod or spindle that passes through the centre of a wheel to connect two wheels. Structures: 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.	Structures: 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. Textiles: A running stitch is a basic stitch that is used to join fabric. It is made by passing a needle in and out of fabric at an even distance.
Cooking and Nutrition	Some foods are healthy. These include fruits, vegetables, nuts and seeds. Food can come from plants and animals.	A recipe is set of instructions for preparing a dish and includes a list of the ingredients required. There are healthy and unhealthy foods. Fruit and vegetables are an important part of a healthy diet. Food comes from different sources, including from animals, such as meat, fish, eggs and dairy, or from plants, such as fruit and vegetables.	Using non-standard measures is a way of measuring that does not involve reading scales. 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.	Some ingredients need to be prepared before they can be cooked or eaten. 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.

	Year 3	Year 4	Year 5	Year 6
Designing	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.	Annotated sketches and exploded diagrams show specific parts of a design, highlight sections or show functions. They communicate ideas in a visual, detailed way.	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.	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.
Making	Materials for a specific task must be selected based on their properties. These include physical properties as well as availability and cost.	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.	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.	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.
Evaluating	Asking questions can help others to evaluate their products, such as asking them whether the selected materials achieved the purpose of the model.	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.	Testing a product against the design criteria will highlight anything that needs improvement or redesign. Changes are often made to a design during manufacture.	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.
Technical Knowledge	Mechanisms: 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. Cams are devices that can convert circular motion into up-and-down motion. Structures: 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.	Mechanisms: Mechanisms can be used to add functionality to a model. 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. Electrical systems: 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 and motors for fairground rides. Textiles: 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.	Mechanisms: 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. Structures: 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.	Electrical systems: Computer programs can control electrical circuits that include a variety of components, such as switches, lamps, buzzers and motors. Structures: 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. Textiles: Pinning with dressmaker pins and tacking with quick, temporary stitches holds fabric together in preparation for and during sewing.