Skills Progression for Design and Technology

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design	**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.**		**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.** **Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.**			
	Can I use my senses to explore a wide range of familiar products? Can I take products apart and talk about the parts and how they work? Can I talk about and/or use words and pictures to plan my design? Can I talk about what I am doing/making?	Can I use knowledge of existing products to support my plan for a similar product? Can I include some knowledge of materials and techniques in my design? Can I explore and investigate products I have disassembled? Can I use construction kits, pictures and captions to plan my design? Can I talk about and describe the tools and materials I need and order the key tasks within my plan?	Can I generate, develop and explain ideas for products to meet the needs of a specific audience? Can I choose appropriate tools and techniques based on those shown? Can I dissemble and investigate everyday products to see how they are fit for purpose? Can I communicate design ideas in different ways (eg verbally, written, in a labelled diagram) Can I plan what I am going to do next based on how my product is developing?	Can I use my knowledge of a range of products to inform my plans and designs? Can I include a range of suitable materials and options in my plans and designs and suggest alternative ways to make their product? Can I talk about and disassemble products and describe their function? Can I use prototypes, labelled sketches and instructions in my plans and designs? Can I talk in depth about my ideas, plans and reasons for choices?	Can I generate plans and designs based on ideas and information that takes account of the users' views and the intended purpose? Can I look at mechanical products to see how they function and meet the user's needs? Can I consider safety and reliability when planning my product? Can I use simple prototypes to test ideas? Can I plan what to do next, suggesting a detailed sequence of actions and alternatives if needed?	Can I generate ideas by collecting and using information, from a number of sources, including ICT based sources? Can I produce detailed designs and plans using prototypes, commentary and diagrams that include measurements and are drawn from different view points? Can I investigate, disassemble and evaluate a range of products and describe in detail their parts and their function? Can I clarify my ideas through discussion, drawing upon and using a range of sources of information? Can I use detailed plans from different views? Can I modify my plans effectively?
Make	**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.**		**Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.** **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.**			
	Can I use simple tools and materials with support, eg. scissors to cut paper? Can I use my senses to explore and talk about materials? Can I join with tape or glue? Can I cut paper/card using scissors? Can I roll paper and card to form a tube? Can I add paper and card shapes to products?	Can I use simple tools to cut and join a range of materials, eg. scissors, stapler, masking tape? Can I use a range of simple ways to improve the appearance of my product? Can I join by edge to edge using glue? Can I curl paper? Can I use a hole punch?	Can I select the appropriate tool to cut or join a range of materials? Can I use tools and equipment to measure, mark out and shape materials and components? Can I select an appropriate way to improve the appearance of my product? Can I make gluing tabs? Can I insert paper fasteners for card linkages? Can I use a hack saw and bench hook? Can I make simple paper models, mock-ups and templates?	Can I select a range of appropriate tools to cut or join materials? Can I use tools and equipment to measure, mark out and shape materials and components with greater accuracy and control? Can I produce a well-finished product that fulfils the function it is designed for? Can I join and combine materials in permanent and temporary ways? Can I use a G clamp? Can I make increasingly complex mock-ups and templates?	Can I select a range of appropriate tools to cut or join materials with accuracy and precision? Can I use a range of tools and equipment to measure, mark out and shape materials and components accurately? Can I identify and apply an appropriate finishing technique to ensure a high quality end product? Can I join and combine a range of materials in permanent and temporary ways? Can I use a drill to make an off-centre hole? Can I make complex mock-ups and templates?	Can I select a range of appropriate tools to cut or join materials with accuracy and precision? Can I use a range of tools and equipment to measure, mark out and shape materials and components accurately? Can I use a variety of finishing techniques eg. collage, paint, embroidery and embellishments? Can I use appropriate finishing techniques to strengthen and improve the appearance, using a range of equipment and ICT to make a product which is finished to a high standard, using the appropriate tools and following a detailed plan?

Evaluate	**Explore and evaluate a range of existing products. Evaluate their ideas and products against design criteria.**		**Investigate and analyse a range of existing products. Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. Understand how key events and individuals in design and technology have helped shape the world.**			
	Can I use my senses to explore a wide range of familiar products? Can I talk about familiar products and what they do? Can I talk about what I am making and what I have done?	Can I talk about and describe features of existing products? Can I talk about what I am doing and what I might do next? Can I suggest ways in which I could improve my work?	Can I use my knowledge of common products, their characteristics and properties to support my work? Can I talk about how the changes I have made have improved by product? Can I identify the ways in which my product meets my design plan?	Can I identify the ways in which I have used my knowledge of products and materials to inform my work? Can I take the function of the product into account when planning? Can I identify the parts of my project that are progressing well and parts that could be improved? Can I identify where evaluation has led to improvements?	Can I test and evaluate products to identify the variants which may affect the function of my product? Can I check my work as it develops and modify may plans if any changes are made? Can I take into account the original criteria when evaluating my product? Can I reflect on my progress and identify ways? Can I improve my product?	Can I carry out appropriate tests before making any improvements, including testing and evaluating products and information sources? Can I give reasons for the success of aspects of my project and provide considered solutions to resolve those parts that could be improved? Can I take into account the original criteria when evaluating my product?
Electrical and Mechanical Components	Can I use my senses to explore battery powered toys, eg, cars, trains, tills etc? Can I talk about electrical equipment in my home, eg, kettle, telephone, and microwave? Can I explore the use of bulbs, wires and batteries?	Can I talk about how common electrical equipment works, eg, kettle, telephone, and microwave? Can I create a simple circuit using a battery, bulb and wires? Can I use remote controlled devices, eg, a remote controlled vehicle, Bee bot etc?	**Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]**			
			Can I describe how a simple battery powered circuit can be controlled by different kinds of switches? Can I create simple circuits incorporating a battery, bulb, switch and wires? Can I talk about simple electrical safety? Can I explore and describe how an electric motor can be used in a circuit? Can I use a remote-controlled device to switch lights on and off? Can I explore and describe materials that can be used to conduct electricity? Can I explore and explain how the direction and speed of an electrical motor can be controlled? Can I explore and program a simple control device?		Can I explore and describe how electrical circuits with switches can be used? Can I use switches in a range of circuits to control components, eg, lights in a lighthouse, a movement sensor in a burglar alarm? Can I use my knowledge of conductors and insulators when constructing circuits? Can I talk in depth about the hazard and safety issues associated with electricity? Can I apply appropriate safety measures when constructing circuits? Can I talk about how electricity can be used to control movement? Can I explore and use a complex control system, eg, a light sensor?	
Food Technology	**Use the basic principles of a healthy and varied diet to prepare dishes? Understand where food comes from?**			**Understand and apply the principles of a healthy and varied diet? Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques? Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed?**		
	Can I sort fruit and vegetables by taste, shape, size, colour and texture? Can I sort food into groups, eg, fruit, vegetable, meat etc? Can I use basic tools to cut, shape and mix, eg, cutters and whisks? Can I understand where a few of the food I am cooking comes from?	Can I work safely and hygienically? Can I sort and classify food into food groups, eg, vegetables, pulses, cereals, dairy etc? Can I measure and weigh accurately using cups and spoons? Can I talk about what happens when I cook and bake? Can I understand what makes a healthy diet? Can I talk about where some of the food I am cooking comes from?	Can I talk about what needs to be done in order to work safely and hygienically? Can I use simple tools eg, hand whisk, rolling pins? Can I sort and classify food according to specific food groups, eg, proteins, carbohydrates, fats etc? Can I measure and weigh using standard units and scales? Can I talk about the way in which food processing can affect the taste, appearance, texture and colour of food? Can I understand what makes a varied and healthy diet? Can I talk about where the food I am cooking comes from?	Can I talk about why we need to work safely and hygienically? Can I talk about the characteristics of a range of food and ingredients and where the foods come from? Can I use my knowledge of food and cooking to start generate my own recipes? Can I talk in simple terms about the physical and chemical (observational skills)? Can I understand how some of the ingredients are grown, reared, caught and processed?	Can I apply the rules for basic food hygiene and other safe practices eg, hazards relating to the use of ovens? Can I talk in detail about the characteristics of a range of food and ingredients and where the food comes from? Can I talk about the impact of changing proportions within a recipe? Can I talk in scientific terms about the physical and chemical changes that take place when food is cooked? Can I understand how a variety of the ingredients are grown, reared, caught and processed?	Can I understand the practice needed in terms of food hygiene and kitchen safety? Can I talk about how the properties of certain foods can affect the final product? Can I choose the appropriate methods and equipment for measuring, eg, time, dry goods, liquids etc? Can I compare and evaluate several ideas in order to draw up a design specification? Can I compare commercial and domestic processes for producing food, eg, bread? Can I understand how most of ingredients are grown, reared, caught and processed? Can I understand seasonality?

Mechanisms. Axles, Pulleys and Gears	**Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.**		**Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].**			
	Can I explore and talk about books containing moving pictures? Can I construct a simple slider with support? Can I construct a simple lever with support? Can I explore and use construction kits containing gears?	Can I deconstruct a simple slider and describe how it works? Can I construct a simple slider independently? Can I make a lever by joining card strips with paper fasteners? Can I attach wheels to a chassis using an axle, eg, cotton reels and dowel? Can I use pencils or tubes as rollers to move an object across the floor? Can I construct a simple pulley using rope over a horizontal bar to raise an object off the ground? Can I use construction kits with gears to construct a line of gears that turn?	Can I deconstruct and reconstruct sliders and levers? Can I join levers to make linkages to create moving parts? Can I vary the position of the pivot point to lift a load using a lever? Can I construct a simple pneumatic system with one moving part? Can I identify the cam within a simple mechanism and explain how movement is changed? Can I construct boxes of different sizes from a net? Can I attach a fixed axle to a chassis and add wheels ensuring that they can move freely? Can I construct a pulley that allows a load to travel horizontally along a rope? Can I use construction kits with gears to mesh gears at right angles?	Can I create a range of sliders and levers to produce horizontal and vertical movement? Can I combine sliders and levers to produce a range of movements? Can I construct a pneumatic with two moving parts? Can I describe the way in which a cam changes rotary motion into linear motion? Can I use a range of different ways to attach an axle to a chassis, eg, card triangles, drilled holes, cable clips and clothes pegs? Can I identify and describe products that contain pulleys and drive belts?	Can I choose and use a range of sliders and levers accurately to create a range of effects? Can I use simple mechanisms eg, pulleys, gears, cams, cogs? Can I attach to motors for electrical control? Can I use the computer to operate switch and devise simple programmes to control own models? Can I describe in detail the way in which an axle and chassis help a vehicle to move? Can I talk about how pulleys and drive systems can be driven by motor and computer?	Can I use a range of technical vocabulary to describe the properties and functions of mechanisms? Can I generate questions to investigate? Can I talk about the relationship between a cam and follower, an off-centre cam, a peg cam, a pear-shaped cam and a snail cam? Can I design and build a working model where the direction of movement can be controlled, eg. with a chassis with a pivoting axle? Can I understand how a belt and pulley system can be used to reverse the direction of rotation, and alter the plane of rotation by 90 degrees? Can I explain how the number of teeth of a gear affects the speed of rotation?
Structures	Can I explore and investigate a range of simple, large scale construction materials, eg, cardboard boxes? Can I build buildings, bridges and towers using small-scale construction materials, eg, Duplo? Can I make simple 3D structures using straws?	Can I construct a range of structures using simple construction kits? Can I make my structures more stable by widening the base? Can I make a square frame from strip wood? Can I make a simple card hinge?	**Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.**			
			Can I deconstruct and assemble the net of basic 3D shapes? Can I measure and cut dowel accurately? Can I use a range of materials to make simple joints, glue, tape and paper clips? Can I make a rectangular frame from strip wood? Can I strengthen 2D frames by adding diagonal bracing struts?	Can I create nets of increasingly complex 3D shapes which include the addition of gluing tabs? Can I use a range of materials to make joints including, card strips, elastic bands, thread and ties, and plastic tubing? Can I reinforce and strengthen 3D framework using the concept of 'triangulation'? Can I explain in detail why some structures fail?	Can I construct regular free standing 3D frames? Can I use techniques for reinforcing and strengthen structures? Can I use construction kits and building instructions to identify how structures are established and strengthened?	Can I create nets and templates accurately in a range of sizes? Can I use a range of methods to strengthen 3D structures and frames? Can I build a range of structures using a wide range of effective materials? Can I investigate measure and record the load tolerance of different structures? Can I find ways of improving a structures load-bearing capacity?
Textiles	Can I sort and group textiles by texture and colour? Can I cut and stick fabrics together? Can I apply simple decoration, e.g. fabric crayons, gluing on feathers etc?	Can I use a simple template? Can I join fabrics using glue, staples and thread? Can I decorate fabrics by painting and printing?	Can I make and use a simple paper pattern? Can I cut and join fabrics using running stitch, buttons and bond web? Can I decorate fabric by applying beads and sequins?	Can I make and use a paper pattern that includes a seam allowance? Can I use a wide range of finishing techniques? Can I use more than one type of stitch to join materials together? Can I select the most appropriate joining technique?	Can I create my own patterns and templates? Can I select an appropriate material to create a product? Can I use a wide range of techniques to add colour, texture and pattern to fabric? Can I sew using a range of stitches including, backward running stitch and over sewing? Can I join fabrics in a range of different ways using zips, tie clasp, toggles, press-studs and buttons?	Can I create my own patterns and templates that are accurately measured? Can I use different but appropriate way to join materials, eg, glue, pins, press studs, Velcro, various stitches, buttons etc? Can I use a sewing machine to join and decorate fabric?