

DT Skills Progression Document - Years 1 - 6

Design and Technology within the modern world is ever present for all. It is imperative that all children are given the opportunities to develop their own personal life skills. Through gaining these experiences, children can foster a love of creative learning, which can then support their potential life decisions. These can include; creativity, critical thinking skills, communication and practical knowledge and competence.

The Programme of Study, delivered through a rich and varied curriculum, enables children to explore their own potential and talents. Through exposing children to practical experiences, such as construction, cooking, sewing, knitting, design, technology and enterprise opportunities. Our pupils will develop a love of creative learning and how this is apparent within the world around us.

How does this link with our school context? Design and Technology will enable all children to develop resilience, confidence and a sense of achievement. Through participating in lessons, which can be practical, pupils will have the opportunity to develop ingenuity and expertise. By challenging their decision-making and risk-taking, their self-awareness will support them into future discoveries and the world beyond.

National Curriculum Expectations	
Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].	
Key Stage 1 pupils should be taught to:	Key Stage 2 pupils should be taught to:
<p>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</p> <p>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</p> <p>Evaluate: Explore and evaluate a range of existing products evaluate their ideas and products against design criteria</p> <p>Technical knowledge: Build structures, exploring how they can be made stronger, stiffer and more stable, explore and use mechanisms [for example, levers, sliders, wheels and axles, in their products.</p>	<p>Design: 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</p> <p>Make: 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</p> <p>Evaluate: 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</p> <p>Technical knowledge: Apply their understanding of how to strengthen, stiffen and reinforce more complex structures understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] apply their understanding of computing to program, monitor and control their products.</p>

National Curriculum Expectations - Cooking and Nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Key Stage 1 pupils should be taught to:	Key Stage 2 pupils should be taught to:
<ul style="list-style-type: none"> *Use the basic principles of a healthy and varied diet to prepare dishes *Understand where food comes from 	<ul style="list-style-type: none"> *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.

Year Group	Design	Make	Evaluate
Intent	Design is important because it develops understanding of the initial processes a designer undertakes. The problem solving and planning stage is a vital step in creating effective products that meet the design criteria. Children will develop essential planning skills in thinking through how to achieve their intended outcome and drawing on previous experiences and knowledge to make their initial designs. They will also learn the valuable processes of reviewing and adapting their designs as the projects continue.	It is imperative that all children are given the opportunity to use a range of skills when performing practical tasks. Examples of practical tasks include; cutting, shaping, joining and finishing. Through developing these skills, when using a wide range of materials, children will develop an understanding of how products are developed from the design starting point to the construction of a product. They will become increasingly aware of how to select and use tools and equipment to cut, shape, join and finish. Furthermore, they will be able to select and use textiles and other materials according to their characteristics.	<p>It is important for children as designers to test and evaluate their prototype and finished product against the design specification by conducting a variety of tests under realistic conditions. This ensures that the product is fit for purpose and responds to the wants and needs of the user.</p> <p>It is important for children to understand and develop evaluative skills as this will allow them to review their product's suitability with regard to the initial design criteria. This will help to plan future projects using evaluation of successes and failures during the planning and making stages.</p>

Year Group	Design	Make	Evaluate
KS1	<ul style="list-style-type: none"> *Generate ideas by drawing on their own and other people's experiences. *Develop their design ideas through discussion, observation, drawing and modelling. *Identify a purpose for what they intend to design and make. *Identify simple design criteria. *Make simple drawings and label parts. 	<ul style="list-style-type: none"> *Begin to select tools and materials; use vocab' to name and describe them. *Measure, cut and score with some accuracy.. *Use hand tools safely and appropriately. *Assemble, join and combine materials in order to make a product. *Cut, shape and join fabrics & use basic sewing techniques. *Follow safe procedures for food safety & hygiene. *Choose and use appropriate finishing techniques. 	<ul style="list-style-type: none"> *Evaluate against their design criteria... *Evaluate their products as they are developed, identifying strengths and possible changes they might make. *Talk about their ideas, saying what they like and dislike about them.
LKS2	<ul style="list-style-type: none"> *Generate ideas, considering the purposes for which they are designing. *Make labelled drawings from different views showing specific features. *Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making, if the first attempts fail. *Evaluate products (effective and ineffective) and identify criteria that can be used for their own designs. 	<ul style="list-style-type: none"> *Select appropriate tools and techniques for making their product. *Measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques. *Join and combine materials and components accurately in temporary and permanent ways. *Sew using a range of different stitches, weave and knit. *Measure, tape or pin, cut and join fabric with some accuracy. *Use simple graphical communication techniques. 	<ul style="list-style-type: none"> *Evaluate their work both during and at the end of the assignment. *Evaluate their products carrying out appropriate tests. *Evaluate their product against original design criteria e.g. how well it meets its intended purpose. *Disassemble and evaluate familiar products.
UKS2	<ul style="list-style-type: none"> *Communicate their ideas through detailed labelled drawings. *Develop a design specification. *Explore, develop and communicate aspects of their design proposals by modelling their ideas in a variety of ways. *Plan the order of their work, choosing appropriate materials, tools and techniques. 	<ul style="list-style-type: none"> *Select appropriate tools, materials, components and techniques. *Assemble components make working models *Use tools safely and accurately. *Construct products using permanent joining techniques. *Make modifications as they go along *Pin, sew and stitch materials together create a product. *Achieve a quality product. 	<ul style="list-style-type: none"> *Evaluate their products, identifying strengths and areas for development, and carrying out appropriate tests. *Record their evaluations using drawings with labels. *Evaluate against their original criteria and suggest ways that their product could be improved.

Technical Knowledge and Skills

Year Group	Structures	Mechanisms	Textiles	Electrical Systems	Food & Nutrition
Intent	<p>Children will gain an understanding of how structures, mechanisms, materials and electrical systems are used and applied in everyday life and are important to the world around us. These 4 areas form the key strands of learning that encompass the design and creation of modern day functional products and how they influence our lives. It is important for children to develop their knowledge of well known products and their designs to use as part of their own design, make and evaluation process.</p> <p>Children need to understand the principles of nutrition and healthy eating to promote their own health and wellbeing and that of others. By being able to explain the benefits of a healthy diet, children will gain a lifelong understanding of the importance of food and nutrition and how this can affect our lives.</p> <p>Through being given the experiences of cooking, children will foster a love of this important life skill and having the ability to explain the benefit of each food group and where food is sourced, they will have an underpinned knowledge and understanding of the world around them.</p>				
KS1	<p>*Use the vocabulary: strength, stiffness and stability. *Identify and describe the purpose of structures. *Turn 2D nets into 3D structures. *Learn that the shape of materials can be changed to improve the strength and stiffness of structures. *Understanding that cylinders are a strong type of structure. *Identify natural and man-made structures. *Identify when a structure is more or less stable than another. *Knowing that shapes and</p>	<p>*Use the vocabulary: up, down, left, right, vertical, pivot and horizontal to describe movement. *Know that levers and sliders are mechanisms and can make things move. *Identify whether a mechanism is a lever or slider. *Determine what movement a mechanism will make. *Know that mechanisms are a collection of moving parts that work together in a machine. *Know that there is an input and output in a</p>	<p>*Use the vocabulary: fabric, sew, needle, stitch, pin, cut, glue, staple, join, finish, strength, stiff, flexible, material, properties, thread. *Identify and use different ways in which to join fabrics together: pinning, stapling, gluing. *Join items using fabric glue or stitching and explain the benefits of these techniques. *Thread a needle. *Sew running stitch, with evenly spaced, neat, even stitches to join fabric. *Neatly pin and cut fabric using a template.</p>	n/a	<p>*Use the vocabulary: hygiene, texture, taste, varied/balanced, diet, nutrition, healthy, packaging, portion, sugar, five food groups - proteins, carbohydrates, fruit and vegetables, dairy, fats & oils. *Understanding the difference between fruits and vegetables. *Describing and grouping fruits by texture and taste. *Understanding what makes a balanced diet. *Knowing where to find the nutritional information on packaging. *Knowing the five food groups.</p>

	<p>structures with wide, flat bases or legs are the most stable.</p> <p>*Understand that the shape of a structure affects its strength.</p> <p>*Know that materials can be manipulated to improve strength and stiffness.</p> <p>*Build strong and stiff structures by folding paper.</p> <p>*Identify man made and natural structures</p>	<p>mechanism.</p> <p>*Identify mechanisms in everyday objects.</p> <p>*Know that a lever is something that turns on a pivot.</p> <p>*Know that a linkage is a system of levers that are connected by pivots.</p> <p>*Identify the parts of wheel mechanisms.</p> <p>*Know how axels help wheels to move a vehicle.</p> <p>*Understanding that axles are used in structures and mechanisms to make parts turn in a circle.</p>			
LKS2	<p>*Use the vocabulary: strut, tie, span, beam, weight, compression, tension, stability, frame, shell, base, legs. Technical vocab for names of building types and structures.</p> <p>*Identify the structural features of a 3D building.</p> <p>*Identify suitable materials to be selected and used for a 3D building, considering weight, compression, tension.</p> <p>*Explore the stability of structures</p> <p>*Understand the difference between frame and shell structure.</p> <p>*Use knowledge of frame and shell structures when</p>	<p>*Use the vocabulary: motion, mechanisms, pneumatic, force, distance, systems, movement</p> <p>*Know that mechanisms are a system of parts that work together to create motion.</p> <p>*Know that pneumatic systems force air over a distance to create movement.</p> <p>*Explain how pneumatic systems work.</p> <p>*Use knowledge of pneumatic systems to design and make mechanisms for a purpose.</p> <p>Pulleys????</p>	<p>*Use the vocabulary: thread, tie, knots, sewing, cross stitch, weave, fabric, layered, fastenings, zip, button, hook & eye, toggle, shoelaces, velcro, buckle,</p> <p>*Thread needles with greater independence.</p> <p>*Tie knots with greater independence.</p> <p>*Sew cross stitch and appliqué.</p> <p>*Understand the need to count the thread on a piece of even weave fabric in each direction to create uniform size and appearance.</p> <p>*Follow a basic pattern to create a design.</p> <p>*Understand that fabrics</p>	<p>*Use the vocabulary of static, electricity, repulsion, conductors, insulators, battery, power, torch, positives and negative.</p> <p>NB Please ensure pupils have already completed LKS2 science electricity units of work.</p> <p>*Explain how electrical items work.</p> <p>*Identify electrical products.</p> <p>*Use electrical components according to their functional properties and aesthetic qualities as part of a project.</p>	<p>*Use the vocabulary: climate, equipment, safety, hygiene, import, export, environment, impact, seasons, benefits, cost, budget, ingredients.</p> <p>*Know that climate affects food growth.</p> <p>*Use cooking equipment safely and hygienically.</p> <p>*Know the importance of how to use, store and clean a knife safely.</p> <p>*Know that vegetables and fruit grow in certain seasons.</p> <p>*Know that each fruit and vegetable gives us nutritional benefits.</p> <p>*Experience the taste of a wide variety of local, regional and world foods.</p>

	<p>designing and making.</p> <ul style="list-style-type: none"> *Further develop knowledge of net structures and frame structures. *Identify the aesthetics of structures. *Consider light, shadow and patterns when designing structures. *Identifying shell structures in everyday life (cars, aeroplanes, tins, cans) 		<p>can be layered for affect.</p> <ul style="list-style-type: none"> *Understand that there are different types of fastenings and what they are. *Articulate the benefits and disadvantages of different fastening types. 	<ul style="list-style-type: none"> *Understand and use electrical systems to design and make products for a purpose (to emit light, to create movement). 	<ul style="list-style-type: none"> *Develop a knowledge of local produce and suppliers. *Know the impact of the cost and importance of budgeting while planning ingredients for a recipe. *Know where imported foods travel from.
UKS2	<ul style="list-style-type: none"> *Use the vocabulary: Strength, beam, arch, bridge, compression, tension, reinforce, truss, suspension bridge, man made, natural *Explore how to create a strong beam. *Identify arch and beam bridges explain how they work. * Identifying stronger and weaker structures. *Identify different ways to reinforce structures including the use of triangles. *Articulate the difference between beam, arch, truss and suspension bridges. *Identify bridges in the local area and famous bridges around the world. *Explain how structures can be strengthened by 	<ul style="list-style-type: none"> *Use the vocabulary: mechanism, output, motion, input, control, movement, cams, direction *Know that an input is the motion used to start a mechanism. *Know that output is the motion that happens as a result of starting the input. *Describe how mechanisms can be used to change one kind of motion into another *Identify combinations of mechanisms that create different movements *Explore cams, learning that different shaped cams produce different follower movements. 	<ul style="list-style-type: none"> *Use the vocabulary: Sew, stitch, fabric, even spacing, thread(ing), technique, accuracy, regularity of stitches, join. * Learn to sew blanket stitch to join fabric. *Apply blanket stitch so the space between the stitches are even and regular. *Thread needles independently . *Learn different decorative stitches. *Sew accurately with even regularity of stitches. *Apply a range of sewing techniques to create a design and a product. 	<ul style="list-style-type: none"> *Use the vocabulary: components, functioning, circuit, series, parallel, electromagnetic, acid, magnetic, motor, generator. NB Please ensure pupils have already completed UKS2 science electricity units of work. E.g. conductors & insulators, series vs parallel, electromagnetic motors, battery safety and computer controlled products. 	<ul style="list-style-type: none"> *Use the vocabulary: reared, processed, beef, cattle, pork, lamb, recipe, adapt, nutritional calculator, ingredients, equipment, combinations, compliment. *Understand where food comes from including types of meat, dairy products, rice and pasta, flour and other manufactured goods. *Explain the journey of an ingredient from farm to fork. *Adapt a recipe/weekly meal planner to make it healthier. *Compare two adapted recipes using a nutritional calculator and then identify the healthier option. *Learn how to research a recipe by ingredient.

	<p>manipulating materials and shapes.</p> <p>*Create a bridging structure.</p> <p>*Identify effective bridge building techniques using technology to test virtual models.</p>	<p>*Explore types of motions and direction of a motion.</p> <p>*Use knowledge of cams, levers, pulleys and gears to create a product with a variety of motions.</p>			<p>*Recording the relevant ingredients and equipment needed for a recipe.</p> <p>*Understanding the combinations of food that will complement one another.</p> <p>*Understand the importance of cutting down food waste.</p> <p>*Identify recipes which use leftover ingredients.</p> <p>*Understand the importance of safe food storage and the techniques used for different foods.</p>
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Need to add information relating to making skills - craft (glue guns, saws, drills etc)

Could this be cutting, joining, measuring - anything else?

Skill Type	Cutting	Drilling & Screwing	Nailing	Gluing	Filling	Sanding
Equipment	Scissors, safety knife, hand saw,	Glue, glue guns, sewing, nails, screws				
Ks1						
LKS2						
UKS2						

Suggested Resources/Projects

NB Additional vocabulary will be added to short term plans or as additional vocabulary mats

Resource Link	Purpose/Outcome	NC Link
Nuffield Primary https://dandfordandt.wordpress.com/resources/nuffield-primary-dt-resources/ There are projects for every year group which can be used for ideas	To design and make a motorised buggy (UKS2 example)	Mechanisms, electrical systems Skills including cutting and joining a wooden frame, building a simple electrical system with a motor, building axles and attaching wheels.
Switched on DT - Rising Stars https://www.risingstars-uk.com/series/switched-on-design-and-technology (worth buying the £100 resources?)	To design and make a bag to carry an item or object (KS1 example)	Textiles Skills including cutting, sewing
Lighthouses and Windmills	Design and Make a lighthouse or windmill ... using cylinders as the base structure (KS1 structures example)	
Castles Kapow Primary School https://www.kapowprimary.com/subjects/design-technology/lower-key-stage-2/year-3/structures-constructing-a-castle/	Design and make 3D structures (LKS2)	
https://www.twinkl.co.uk/search		
Toys - the difference between Buzz and Woody		
Local, regional and world foods		
https://www.planbee.com/bridge-building-challenge-ks2-structures ipad/android bridge building app		
