## Design Technology– Whole School Progression of Skills:

Below is an overview of the projects covered across year groups, the skills developed in designing, making and evaluating and cooking and nutrition knowledge as a separate strand. It is designed to be a spiral curriculum – children will return to topics multiple times, allowing them to build on their skills and carry out more advanced and technical projects throughout their Primary journey. The core principles of **Design, Make, Evaluate** will be covered in all projects. (Note Electrical systems is KS2 only, and is taught in Science at Year 4 and Year 6).

| | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Projects/coverage | ➢ Junk modelling – cutting, building, joining<br>➢ Soup-veggies – trying foods, choosing veg<br>➢ Bookmarks – plastic needle practise<br>➢ Structure – boats, folding, building, testing<br>➢ Other seasonal projects – Christmas, Easter, related to outdoor areas/themes | *structures – lollipop sticks<br>*Mechanisms Paper pop ups (mechanisms)<br>* Food – fruit/smoothies | *structures – playground for T man<br>* Textiles – money pouch/toys<br>*Food – balanced diet, sandwich/wrap/pizza | *Structures – product packaging, boxes and nets<br>*Mechanical systems – pneumatic toys *NEED SYRINGES/PIPES<br>* Food – seasonal, pastry sweet or savoury | *Mechanical systems – cars, possible use of motors OR<br>*Electrical – poster/display with a simple circuit and bulb<br>* Textiles – making a fastening – a button, toggle or other.<br>*Food – adapting a recipe, adding ingredients/testing flavours | * Mechanical – gears and pulleys, OR Structures, bridges.*Textiles – stuffed toys. Teddy/monster/ character.<br>*Food – adapting a recipe – bolognaise, or other food. (Good link to enrichment). | *Electrical systems – microbits (Computing cross curric) OR hand steady game, with wire.<br>*Food – 'Restaurant' – three course meal, showcasing learning from prior units.<br>*Textile or mechanical – bags with pockets, straps, etc/wearable textile, OR mechanical cams and pop ups/puppets. |
| Technical knowledge and skills | • Cutting a range of materials safely<br>• Joining materials using different methods (glue, tape, slotting)<br>• Building and assembling structures<br>• Exploring shape, balance, and how things fit together<br>• Developing fine motor control and hand strength<br>• Threading a needle<br>• Practising simple stitching (e.g. running stitch)<br>• Improving fine motor skills and control<br>• Folding, shaping, and assembling materials<br>• Constructing simple structures<br>• Testing and evaluating how things work<br>• Exploring stability, strength, and floating/sinking<br>• Identifying what works well and making improvements<br>• Beginning to solve simple problems<br>• Applying skills across different contexts<br>• Exploring a range of materials and tools<br>• Following and adapting simple design ideas<br>• Developing creativity and imagination<br>• Working independently and with others<br>Food – see page 2 | • To understand that the shape of materials can be changed to improve the strength and stiffness of structures<br>• To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses)<br>• To understand that axles are used in structures and mechanisms to make parts turn in a circle<br>• To begin to understand that different structures are used for different purposes<br>• To know that a mechanism is the parts of an object that move together<br>•To know that a slider mechanism moves an object from side to side • To know that a slider mechanism has a slider, slots, guides and an object<br>• To know that bridges and guides are bits of card that purposefully restrict the movement of the slider<br>Food – see page 2 | • To understand that the shape of a structure affects its strength<br>• To know that shapes and structures with wide, flat bases or legs are the most stable<br>• To know that materials can be manipulated to improve strength and stiffness<br>• To know that a structure is something which has been formed or made from parts<br>• To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move<br>• To know that a 'strong' structure is one which does not break easily<br>• To know that a 'stiff' structure or material is one which does not bend easily<br>• To know that sewing is a method of joining fabric<br>• To know that different stitches can be used when sewing<br>• To understand the importance of tying a knot after sewing the final stitch<br>• To know that a thimble can be used to protect my fingers when sewing<br>Food – see page 2 | • To understand that wide and flat based objects are more stable<br>• To understand the importance of strength and stiffness in structures<br>• To understand how pneumatic systems work<br>• To understand that pneumatic systems can be used as part of a mechanism<br>• To know that pneumatic systems operate by drawing in, releasing and compressing air<br>Food – see page 2<br><br>(Year 4 >>>>>>>)<br>Electrical<br>• To understand that electrical conductors are materials which electricity can pass through<br>• To understand that electrical insulators are materials which electricity cannot pass through<br>• To know that a battery contains stored electricity that can be used to power products<br>• To know that an electrical circuit must be complete for electricity to flow<br>• To know that a switch can be used to complete and break an electrical circuit | • Structures that can be unsupported<br>*Build on prior knowledge of structures, shapes (E.g. triangles, cylinders), manipulation of materials and flexible/vs stiff materials.<br>• To understand what a 'frame structure' is<br>• To know that a 'free-standing' structure is one which can stand on its own (and be able to name/create some examples of these)<br>• To understand that all moving things have kinetic energy<br>• To understand that kinetic energy is the energy that something (object/person) has by being in motion<br>• To know that air resistance is the level of drag on an object as it is forced through the air<br>• To understand that the shape of a moving object will affect how it moves due to air resistance.<br>• To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro<br>• To know that different fastening types are useful for different purposes<br>• To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions<br>Food – see page 2 | • To know that mechanisms control movement<br>• To understand that mechanisms that can be used to change one kind of motion into another<br>• To understand how to use sliders, pivots and folds to create paper-based mechanisms<br>• To understand some different ways to reinforce structures<br>• To understand how triangles can be used to reinforce bridges<br>• To know that properties are words that describe the form and function of materials<br>• To understand why material selection is important based on their properties<br>• To understand the material (functional and aesthetic) properties of wood<br>• To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric<br>• To understand that it is easier to finish simpler designs to a high standard<br>• To know that soft toys are often made by creating appendages separately and then attaching them to the main body<br>• To know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely<br>Food – see page 2 | Electrical (Year 5 and 6)<br>• To know the key components used to create a functioning circuit<br>• To know that copper is a conductor and can be used as part of a circuit<br>• To understand that breaks in a circuit will stop it from working<br>• To understand that a series circuit only has one path for the electrical current to flow from positive to negative (Science)<br>• To know that we use symbols to represent components in a circuit diagram<br>• To know the names of the components in a basic series circuit: crocodile wires, LED (light-emitting diode), battery holder, battery, cell<br>Showcase learning from all prior projects: Including some of the following:<br>✓ Wide base structures<br>✓ Manipulating materials for strength<br>✓ Understanding stability<br>✓ Select materials accordingly<br>✓ Use of shapes, e.g. triangles or cylinders as supportive structures<br>• To know that structures can be strengthened by manipulating materials and shapes.<br>• To understand that it is important to design clothing with the client/ target customer in mind<br>• To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric<br>• To understand the importance of consistently sized stitches<br>Food – see page 2 |

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| DESIGN | EYFS Develop their own ideas and then decide which materials to use to express them<br><br>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. | Year 1 - Draw on experience to help generate ideas Explain intentions<br>Identify a target group to design and make for Develop design ideas applying findings from research | Year 2 - Generate ideas by drawing on own and other's experiences<br>Develop design ideas through discussion, observation, drawing and modelling Identify a purpose for intended design and make model ideas in card and paper Identify simple design criteria<br>Make simple drawings and label parts | Year 3 - Generate ideas, considering purpose & user/s<br>Identify a purpose &establish criteria for a successful product.<br>Plan the order of work before starting Explore, develop, communicate design proposals & model ideas<br>Create drawings with labels when designing | Year 4 -Generate ideas, considering the purposes for which they are designing<br>Make labelled drawings from different views showing specific features<br>Develop a clear idea of what has to be done, plan how to use materials, equipment and processes, and suggesting alternative methods of making, if the first attempts fail<br>Evaluate products and identify criteria that can be used for their own designs | Year 5 -Generate ideas & identify a purpose for product<br>Draw up a specification for design<br>Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggest alternative methods of making if the first attempts fail<br>Use results of investigations, information sources, including ICT when developing design ideas | Year 6 - Generate, develop, model, communicate ideas- discussion, annotated sketches, cross-sectional & exploded diagrams, prototypes, pattern pieces.<br>Explore, develop and communicate aspects of design proposals by modelling ideas in a variety of ways<br>Plan the order of work, choosing appropriate materials, tools, techniques<br>Use research & develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose |
| MAKE | Join different materials and explore different textures<br><br>Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park | Make design using appropriate techniques With help measure, mark out, cut and shape a range of materials<br>Use tools eg scissors & hole punch, safely Assemble, join & combine materials & components using a variety of temporary methods e.g. glues or masking tape | Begin to select tools & materials; name & describe<br>Measure, cut and score with some accuracy Use hand tools safely and appropriately Assemble, join and combine materials to make a product<br>Cut, shape and join fabric to make a simple puppet using basic sewing techniques<br>Choose and use appropriate finishing techniques | Select tools & techniques appropriate to products<br>Measure, mark out, cut, score, assemble - more accuracy<br>Work safely with a range of simple tools Generate ideas - be willing to change to improve<br>Measure, tape, pin, cut, join fabric-some accuracy<br>Use finishing techniques to strengthen and improve the appearance of a product using a range of equipment including ICT | Measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques for the product<br>Join and combine materials and components accurately in temporary and permanent ways<br>Make modifications during construction<br>Sew using a range of different stitches and weave<br>Use simple graphical communication techniques | Use skills in selecting & using different tools and equipment safely and accurately – including measure and mark out accurately<br>Use tools safely and accurately to construct products -permanent joins<br>Cut & join accurately - good-quality finish to the product | Identify strengths & developments needed in ideas & products.<br>Know how much products cost to make, how sustainable and innovative they are and the impact products have beyond their intended purpose.<br>Pin, sew and stitch materials together to create a good quality finish |
| EVALUATE | Share their creations, explaining the process they have used.<br>Start to think about what they might change next time. | Discuss how well product works in relation to purpose<br>Evaluate product - ask questions about what & how it was made<br>Discuss ideas - like and dislike | Evaluate against simple design criteria Evaluate products as developed, identifying strengths and possible changes they might make<br>Discuss possible changes to improve the product next time. | Evaluate a product against original design criteria e.g. how well it meets its intended purpose<br>Disassemble and evaluate familiar products | Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage).<br>Describe how electrical circuits and components can be used to create functional products.<br>Create series and parallel circuits | Understand how mechanical systems – create movement & have an input, process and output.<br>Choose suitable techniques to construct, repair or strengthen items.<br>Begin to understand that electrical systems<br>have an input, process and output. | Know how more complex electrical circuits and components can be used to create functional products and how to program a computer to monitor changes in the environment and control products.<br>Know how to reinforce and strengthen a 3D framework.<br>Begin to understand that levers& linkages and pneumatic systems create movement. |
| Cooking and nutrition | Understand basic food hygiene - importance of washing hands<br>Begin to talk about which foods they like and dislike.<br>Handling simple tools safely (e.g. child-safe knives)<br>Preparing and combining ingredients<br>Exploring textures, tastes, and smells<br>Developing awareness of healthy eating | • Explain simply that food comes from plants or animals.<br>• Explore the understanding that food has to be farmed, grown elsewhere or caught.<br>• Explore the meaning of healthy eating and begin to understand that a healthy diet contains 5 portions of fruit and vegetables. With support-prepare simple dishes safely and hygienically, without using a heat source.<br>• Children can cut and grate ingredients safely. Understand basic food hygiene - importance of washing hands | • Demonstrate an understanding that food comes from plants or animals.<br>• Know that everyone should be having a combination of 5 portions of fruit or vegetables every day.<br>• Name the 5 food groups and use this knowledge to sort foods into the food groups. Demonstrate how to prepare simple dishes safely and hygienically, without using a heat source.<br>• Cut, peel and grate ingredients safely. Follow safe procedures for food safety and hygiene | • Demonstrate hygienic food preparation & storage<br>• Develop an understanding of the need to measure ingredients accurately<br>• Describe which food is grown (fruit & veg), reared (farmed animals) and caught (fish & seafood) in the UK, Europe & wider world. Prepare & cook some savoury dishes using known techniques and a heat source.<br>• Explain food and water are needed to keep the body healthy.<br>• Explain a healthy diet is a variety & balance of different food | • Demonstrate hygienic food preparation &storage<br>• Measure ingredients accurately<br>• Explain how food is grown/reared/caught in the UK, Europe and the wider world.<br>• Prepare and cook a range of predominately savoury dishes using a heat source.<br>• Know how to use a range of techniques such as **peeling, chopping, slicing, grating, mixing, spreading, kneading and baking**.<br>• Explain that a healthy diet is food made up of a variety and balance of different food.<br>• Explain that food and drink are needed to provide energy for the body to be active and healthy | • Apply rules for basic food hygiene & other safe practices –awareness of hazards etc<br>• Weigh and measures accurately (time, dry, ingredients, liquids)<br>• Know that food is grown, reared or caught in the UK, Europe & wider world.<br>• Understand that seasons may affect the food available.<br>• Prepare and cook a range of mainly savoury dishes using a heat source and a range of known techniques. **(e.g. peeling, chopping, slicing, grating, mixing, spreading, kneading and baking)**<br>• Know that to be active and healthy food and drink are needed to provide the energy for the body. | • Apply rules for basic food hygiene and other safe practices.<br>• Weigh and measure accurately.<br>• Prepare and cook a range of mainly savoury dishes using a heat source.<br>• Know and use a range of techniques, e.g. chopping, peeling, mixing, whisking, rolling, baking, simmering, etc – choosing appropriately.<br>• Know different food and drink contain different substances – nutrients, water and fibre, that are needed for health.<br>• Understand how good is processed into ingredients that can be eaten or used in cooking. |