Orchard Primary School - Progression of Knowledge & Skills in Design & Technology

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Expected Standard						
DESIGN - Developing, Planning and Communicating Ideas	• Work within different contexts such as story-based, home, school, playground. • Generate ideas from existing examples. • Begin to talk about their designs	• Work within a range of contexts e.g. story-based. • Use existing knowledge to generate their own original designs • State what products they are designing and making • Say whether their products are for themselves or other users • Explain what their products are for • Plan an outcome through pictures with labels • Model their ideas in card and paper where necessary	• Generate ideas by drawing on their own and other people's experiences • Work confidently within a range of contexts e.g. imaginary, local community, industry and wider environment • Generate further ideas through comparing existing products • Describe their design using pictures, diagrams and words • Identify a purpose for what they intend to design and make • Identify a target group for their product and say how the product will be useful for the user • Identify simple design criteria • Develop their design ideas through discussion, observation , drawing and modelling • Model ideas by exploring materials, components, constructions kits and by making templates and mockups. • Make simple drawings and label parts • Start to describe how a commercial product works • Make increasing use of ICT to plan ideas	• Generate ideas for an item, considering its purpose and the user/s • Identify a design criteria and establish a purpose/ audience for their product • Plan their design, using diagrams and labels to indicate the design features of their products • Plan the equipment/ tools needed and give reasons why • Start to order the main stages of making their product • Explore, develop and communicate design proposals by modelling ideas • Use what they know about the properties of materials to plan their ideas • Share and clarify ideas through discussion. • Model ideas using prototypes. • Use annotated diagrams and some computer- aided design packages, to develop and communicate ideas. • Generate realistic ideas, focusing on the needs of the user. • Begin to take account of the availability of resources.	• Generate ideas, considering the purposes for which they are designing • Collect and use information to generate ideas e.g. gather information about the needs and wants of individuals or groups. • 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 • Create a detailed plan considering their target audience, design criteria and intended purpose • Consider the way the product will be used when planning • Make labelled drawings from different views showing specific features, annotated sketches, some cross-sectional drawings and computer-aided design packages to develop and communicate ideas • Create a final design for their product based on initial ideas and revisions, based on existing ideas • Understand designs must meet a range of criteria • Think ahead about the order of their work • Share and clarify ideas confidently, through discussion • Model ideas using prototypes and pattern pieces	• Generate ideas through brainstorming and identify a purpose for their product • Where relevant, survey their target audience and use this to generate ideas • Take a user's view into account when designing • Produce a detailed step-by-step plan for their design method • Suggest some alternative designs and compare the benefits and drawbacks to inform the design process and outcome • Use sketches to show other ways of doing things – and then make choices between designs • Where necessary, make up a prototype first • Draw up a specification for their design • Make design decisions that take account of the availability of resources. • 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 • Use results of investigations, information sources, including IT when developing design ideas	• Generate innovative ideas from prior research, using a range of information to inform their design • Use market research to inform plans • Where necessary, keep constraints in mind when selecting materials in design e.g. costs; available materials • Develop their own design criteria and use this to inform their ideas • Use their knowledge of science and art when designing • Draw scaled diagrams with increasing use of ratio • Consider the use of the product when selecting materials • Where relevant, make up a prototype or pattern piece first • Communicate their ideas through detailed labelled drawings and justify their plan to someone else • 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

TECHNNICAL KNOLWEDGE	• Pupils recognise that a range of technology is used in places such as homes and schools • They select and use technology for particular purposes • Begin to know about the simple working characteristics of materials and components • Begin to understand the movement of simple mechanisms such as levers, sliders and wheels, or toys with buttons and mechanisms	• Select and use technology for particular purposes • They know how to operate simple equipment and show an interest in toys with buttons, flaps and simple mechanisms and operate them successfully. • Pupils understand the simple working characteristics of materials and components. • Know about the movement of simple mechanisms such as levers, sliders, wheels and axles. Identify the key features of an existing product • Know how some moving objects work	• Pupils understand the working characteristics of materials and components. • They know about the movement of simple mechanisms such as levers, sliders, wheels and axles. • Explain how different parts move • Join materials together as part of a moving product • Understand how freestanding structures can be made stronger, stiffer and more stable. • Recognise that 3D textiles products can be assembled from two identical fabric shapes. • Use the correct technical vocabulary for projects	• Pupils know how to use learning from science and mathematics to help design and make products that work. • They understand that materials have functional and aesthetic qualities. • Recognise that materials can be combined and mixed to create more useful characteristics. • Know how mechanical systems such as levers and linkages create movement. • Use a range of components (e.g. levers, linkages and pneumatic systems) • Know that simple electrical circuits and components can be used to create functional products. • Program a computer to control their products. • Manipulate materials using a range of tools and equipment(often with support) • Measure, cut and assemble with increasing accuracy • Work out how to make models stronger	• Pupils use learning from science, mathematics and other subjects to help design and make products that work. • They understand that materials have functional and aesthetic qualities and apply this thinking successfully to their own products. • Recognise that materials can be combined and mixed to create more useful characteristics. • Know that mechanical and electrical systems have an input, process and output. • Know how mechanical systems such as levers and linkages create movement. • Know that simple electrical circuits and components can be used to create functional products. • Program a computer to control their products. • Use a simple circuit and add components to it to create motion or make light • Understand how some properties can be used – e.g. waterproof • Explain why they have selected materials, tools and techniques to use • Independently manipulate materials using a range of tools and equipment • Measure, cut and assemble with accurately • Use a range of components (e.g. levers, linkages and pneumatic systems) • Understand how wheels, axles, turning mechanisms, hinges and levers all work together	• Know that mechanical and electrical systems have an input, process and output. • Know how mechanical systems such as levers and linkages create movement. • Know that simple electrical circuits and components can be used to create functional products. • Apply their understanding of how to strengthen, stiffen and reinforce more complex structures • Understand and use mechanical systems in their products [e.g. gears, pulleys, cams, levers and linkages] • Understand and use electrical systems in their products [e.g. series circuits incorporating switches, bulbs, buzzers and motors] • Apply their understanding of computing to program and control products.	• Apply their understanding of how to strengthen, stiffen and reinforce more complex structures • Understand and use mechanical systems in their products [e.g. gears, pulleys, cams, levers and linkages] • Understand and use electrical systems in their products [e.g. series circuits incorporating switches, bulbs, buzzers and motors] • Explore more complex electrical circuits and components • Create designs including hydraulics and pneumatics when/where appropriate • Program computers and devices to monitor changes in the environment and control their products.

MAKING (construction & textiles) - Working with tools, equipment, materials and components to make quality products	• Shows some planning skills by suggesting what to do next. • Begins to follow safety procedures. • Selects from a range of materials and components.	• Make their design using appropriate techniques • With help measure, mark out, cut and shape a range of materials • Use tools e.g. scissors and a hole punch safely • Assemble, join and combine materials and components together using a variety of temporary methods e.g. glues or masking tape • Make a structure/model using different materials • Make simple models, not necessarily with a purpose • Join textiles together • Use simple finishing techniques to improve the appearance of their product	• Begin to select tools and materials; use vocabulary to name and describe them • Use their knowledge of some working characteristics of materials when designing • Measure, cut and score with some accuracy • Use hand tools safely and appropriately • Select tools for folding, joining, rolling • Assemble, join and combine materials in order to make a product • Use a simple template for cutting out • Cut, shape and join fabric. • Use basic sewing techniques to make a product. • Choose and use appropriate finishing techniques	• Select tools and techniques for making their product • Measure, mark out, cut, score and assemble components with more accuracy • Measure and cut out using centimetres • Prepare for work by assembling components together before joining • Score and fold for precision • Alter and adapt materials to make them stronger • Combine a number of components together in different ways • Work safely and accurately with a range of simple tools • Think about their ideas as they make progress and be willing change things if this helps them improve their work • Measure, tape or pin, cut and join fabric with some accuracy • Use finishing techniques strengthen and improve the appearance of their product using a range of equipment including IT	• Select appropriate tools and techniques for making their product • Measure, mark out, cut and shape a range of materials accurately to build effective structures or to create a product • Uses appropriate tools, equipment and techniques • Experiments with a range of techniques to increase • stability in a structure • Considers which materials are fit for purpose and joins them appropriately • Joins with a greater range of techniques – e.g. staples • Strengthen joins and corners in a variety of ways • Join and combine materials and components accurately in temporary and permanent ways • Devise a template or pattern for their product • Can increasingly model their ideas before making • Measure accurately to centimetres and grams • 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 • Use finishing techniques, showing an awareness of audience (e.g. sanding, varnishing, glazing)	• Select appropriate materials, tools and techniques to ensure • that the final product will appeal to the audience • Measure and mark out accurately in mm and cm • Use skills in using different tools and equipment safely and accurately • Weigh and measure accurately (time, dry ingredients, liquids) • Cut and join with accuracy to ensure a good-quality finish to the product • Make stable and strong joins to stand the test of time • Can they use a range of tools and equipment with good accuracy and effectiveness, within established safety • parameters • Can use a range of joining techniques • Demonstrate that their product is strong and fit • for purpose • Consider the audience when choosing textiles • Devise a template or pattern for their product	• Select appropriate tools, materials, components and techniques • Assemble components make working models • Measure and cut out in precise detail, and make sure that finished products are carefully finished • Use different kinds of circuits in their product to improve it • Incorporate a switch into their product • Incorporate hydraulics and pneumatics • Make separate elements of a model, with • improvements where necessary, before combining into the finished article • Produce a simple instruction manual or handbook for their product • Use a range of joining techniques • Choose appropriate tools and materials to ensure that the final product will appeal to the audience • Use a range of tools and equipment with good accuracy and effectiveness, within established safety parameters • Consider the audience when choosing textiles • 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

COOKING & NUTRITION	• Start to prepare simple dishes. • Use food preparation techniques e.g. cutting and peeling. • Begin to recognise that everyone should eat at least five portions of fruit and vegetables every day	• Describe what they want to make using pictures and words • Make lists of materials they will need • Explain what they are making • Use techniques such as cutting, peeling, grating • Use basic food handling, hygienic practices and personal hygiene when preparing simple dishes • Understand the principles of a healthy diet	• Understand and use the terms ingredient and component • Use simple scales or balances • Know how to prepare simples dishes safely and hygienically, without using a heat source. • Select and use appropriate fruit and vegetables, processes e.g. cutting, peeling, grating and tools • Recognise that a healthy diet is made up of a variety and balance of different foods and drinks, as depicted on 'The Eatwell Plate.'	• Understand and apply the principles of a healthy and varied diet • Begin to select their own ingredients when cooking or baking • Know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically, including the use of a heat source. • Know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. • Present food in an appealing way • Understand safe food storage • Weigh in grams • Demonstrate hygienic food preparation and storage • Know that to be active and healthy, food is needed to provide energy for the body.	• Know that food is farmed, reared, grown elsewhere (e.g. home, allotments), exported, imported or caught. This can be on a local, regional and international scale. • Prepare and cook a variety of sweet and savoury dishes safely and hygienically, including the use of a heat source • Use a wide range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. • Select their own suitable ingredients when cooking or baking • Present food in an appealing way • Understands and explain safe food storage • Can evaluate food by taste, texture, flavour etc	• Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed • Begin to know how food is processed into ingredients that can be eaten or used in cooking • Know how to prepare and cook a variety of savoury and some sweet dishes safely and hygienically, including the use of a heat source. • Apply the rules for basic food hygiene and other safe practices e.g. hazards relating to the use of ovens • Use proportions when cooking, by doubling and halving recipes • Can modify a recipe and explain why they have changed it • Can meet an identified need – e.g. a meal for an older person – by selecting suitable ingredients • Work in a safe and hygienic way	• Consider culture and society in their food choices • Can keep cost constraints in mind when selecting ingredients • Can calculate the amount of ingredients needed use this to estimate cost • Can use proportions when cooking extending beyond doubling and halving recipes • Can begin to write their own recipes based on recipes they have previously tried • Know that recipes can be adapted to change the taste, texture, aroma and appearance. • Can make choices/changes to recipes and justify their decision • Know that different foods contain substances that are needed for health e.g. water, fibre, vitamins, minerals and nutrients. • Understand that healthy diets must incorporate the correct amounts of food types and substances.
EVALUATING	• Begin to talk about their design ideas and what they are making. • Think about how to make their products better. • Begin to explore what products are, who they are for, how they are used, where they are from.	• Use simple terms to talk about their own and others' work • Can describe how their product works • Can identify success, how to improve their products and next steps	• Can talk about their design ideas and what they are making • Can assess how well their product works • Can use like and dislike when evaluating or describing their product • Recognises what they have done well and can talk about what could be improved • Can seek out the views and judgements of others • Can predict how changes might improve the finished product • Can use digital photography to present design or finished work	• Thinks about their ideas as they make progress and are willing to make changes if this helps them to improve their work • Can assess how well their product works in relation to the purpose • Can explain how they could change their design to make it better • Can alter and adapt original plans following discussion and evaluation • Recognises what has gone well, but suggests further improvements for the finished article	• Can talk about what they like and dislike about their own and existing products, giving reasons • Develops their designs through their own reflection and the evaluation of others • Can carry out tests before making improvements • Thinks about their ideas as they progress and make changes to improve their work • Can assess how well their product works in relation to the design criteria and the intended purpose • Explains how they could improve their design and how their improvement would affect the original outcome	• Checks that their design is effective and fit for purpose • Can assess how well their product works in relation to the design criteria and the intended purpose and suggest improvements • Evaluates appearance and function against the original design criteria • Can identify what is working well and what might be improved – and make choices from several alternatives • Refine the quality of the finished product, including making annotations on the design • Can increasingly use testing to improve models and finished products • Makes improvements from design suggestions • Consider cost and sustainability	• Confidently tests and evaluates their final product • Can assess and explain whether it is fit for purpose • Describes and explains what would improve it and why • Can discuss whether different resources have improved their product • Explain if they need more or different information to make it even better • Test and evaluate commercial products, understanding how this information supports their own designs • Can evaluate a range of different sources of information such as advertising and handbooks • Is able to demonstrate that their product is strong and fit for purpose • Recognise several inventors, designers, chefs, manufacturers and engineers, who have been influential in the design and technology industries.

Greater Depth Standard							
	• Confidently explores what products are, who they are for, how they are used, where they are from • Understands the simple working characteristics of materials and components and can talk about how a product works with confidence. • Shows exceptional skill in developing and communicating ideas by talking and drawing. • Confidently uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products.	• Shows confidence and independence when exploring what products are, what they are made from, who they are for, how they are used, where they are from • Pupils show a more advanced understanding of the working characteristics of materials and components • Shows exceptional skill in using knowledge of existing products to help come up with ideas, confidently communicating plans by talking and drawing. • Confidently and with greater independence uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products.	• Can justify and give reasons for their products as part of their evaluation. • Confidently uses and applied learning from science and mathematics to help design and make products that work. • Shows exceptional skill in using annotated sketches to develop and communicate ideas. • Confidently and with greater independence uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products.	• Refers to their design criteria continuously as they design and make their product and use their design criteria to evaluate their completed products. • Pupils confidently use and apply learning from science, mathematics and other subjects to help design and make products that work. • Shows exceptional skill in using annotated sketches and discussion to develop and communicate ideas. • Confidently and independently uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products.	• Investigates and analyses more deeply: who designed the products; where products were designed and made; when products were designed and made; whether products can be recycled or reused. • Explores more complex mechanical systems or electrical components. • Shows exceptional skill in using annotated sketches and cross-sectional drawings to develop and communicate ideas. • Confidently and independently uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products.	• Confidently consider the impact and innovative qualities of their products. • Explores more complex mechanical systems, pneumatics or electrical components. • Shows exceptional skill in using annotated sketches, cross-sectional drawings and computer-aided design packages, to develop and communicate ideas. • Confidently, accurately and independently uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products.	• Investigate and analyse: how much products cost to make; how innovative products are; how sustainable the materials in products are; what impact products have beyond their intended purpose. • Confidently and independently combines and mixes materials to create products which are finished to a high specification • Incorporates more complex mechanical systems, pneumatics or electrical components into their products. • Shows exceptional skill in using annotated sketches, cross-sectional drawings, exploded diagrams and computer-aided design packages, to develop and communicate ideas. • Confidently, accurately and independently uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products.
Examples of Deeper Thinking Questions	•	• What would you change about your design and why? • How could you make your design faster/stronger etc. • What do you like about someone else's design? • What would happen if you changed….?	• What could you do to make your design better and what difference would this change make? • Find one thing that is better about someone else's design. • How would you help someone who wanted to make their own…? • What is the best/worst thing about your design?	• What could you change to improve your design and what impact would this change have? • What made creating your design difficult? • What questions would you ask if…?	• Explain what you could change and how it • would improve your design? • How would you change your design for the 'real world'? • How effective at…. Is your…?	• How could you make your design more suited to mass production? • What developments would need to be made for your design to….? • What tests would you need to do to…?	• What would you need to change to be able to sell your design? • How could you adapt… to make…? • What do you predict would happen if…? • Judge whether…. would cause/change/affect….