Calcot Schools Design Technology Progression of Skills

Within each DT project it is essential that the children engage with the following **3 core activities** (each of which may take a number of sessions)
1) investigating and evaluating existing products-looking at pre-existing ones, searching for similar products, pulling them apart to look at their structures-drawing them.
2) Focused tasks in which children develop particular aspects of knowledge and skills and are taught-rather than learn purely through exploration
3) Designing and making activities in which children design and make '**something**' for '**somebody**' for '**some purpose**'.

Units begin with a design brief that provides the pupils with a problem. From here they are able to identify the Ws (who, what, where, when, why) Having identified the these including the purpose and target audience they spend time pulling apart the brief and working collaboratively to identify their knowledge of these areas. From here, the research stage begins. This phase combines independent research, modelling, teaching, questioning of users, current product research and evaluation, product autopsy and expert guidance. Following this the pupils will have a good understanding of what the design specification should include. Ideation is an important part of the design stage and our pupils spend time working independently but also together to generate ideas. These are through drawing, modelling and the use of CAD. Once they have had time to develop their ideas they finalise their design and present this. Whilst the make stage is important, our children are encouraged to spend a significant amount of time on the first stages of the design process. After making and sometimes this may be a prototype (rather than the completed product) the children spend time evaluating their product. They do this by evaluating it against the design brief and specification, by testing their product out and getting feedback from their target audience before stating the changes that they had to make and would make to improve it further. The structure of our design process will always follow the overview given above; however some parts and some skills will differ according to the cohort and age of the children. **The progression of skills below is largely based on the Design and Technology Progression Framework Design created by the Technology Association National Curriculum Expert Group for D&T.**

Designing	EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Understanding contexts, users and purposes	• work within contexts familiar to EYFS children including home, school, playground and gardens. • say what they are making and who it is for. • explain how their product will be used. • begin to use the language of designing and making, e.g. join, build and shape.	• work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment • state what products they are designing and making • say whether their products are for themselves or other users (target audience) • describe what their products are for • say how their products will work	work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users (target audience) • explain how particular parts of their products work	work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users (target audience) • explain how particular parts of their products work

February 2020 NB

		• say how they will make their products suitable for their intended users (target audience) • use simple design criteria to help develop their ideas.	• gather information about the needs and wants of particular individuals and groups • develop their own design criteria and use these to inform their ideas	• carry out research, using surveys, interviews, questionnaires and web-based resources • identify the needs, wants, preferences and values of particular individuals and groups • develop a simple **design specification** to guide their thinking
Generating, developing, modelling and communicating ideas	• generate ideas by copying pre-existing ones or examples made by others. • model ideas by communicating ideas verbally and by making simple drawings.	• generate ideas by drawing on their own experiences • use knowledge of existing products to help come up with ideas • develop and communicate ideas by talking and drawing • model ideas by exploring materials, components and construction kits and by making templates and mockups • use information and communication technology, where appropriate, to develop and communicate their ideas	• share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas • use computer-aided design to develop and communicate their ideas (Purple Mash and for more complex design Sketch Up) • generate realistic ideas, focusing on the needs of the user • make design decisions that take account of the availability of resources	• share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas • use computer-aided design to develop and communicate their ideas (Sketch Up and Tinker Cad) • generate innovative ideas, drawing on research • make design decisions, taking account of constraints such as time, resources and cost
Making	**EYFS**	**Key Stage 1**	**Lower Key Stage 2**	**Upper Key Stage 2**
Planning	• to learn to construct with a purpose in mind. • selects tools ,materials and techniques needed to shape, assemble, join and finish.	• plan by suggesting what to do next • select from a range of tools and equipment, explaining their choices	• select tools and equipment suitable for the task • explain their choice of tools and equipment in relation to the skills and techniques they will be using	• select tools and equipment suitable for the task • explain their choice of tools and equipment in relation to the skills and techniques they will be using

	• say and explain what I am making	• select from a range of materials and components according to their characteristics	• select materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities • order the main stages of making	• select materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities • produce appropriate lists of tools, equipment and materials that they need • formulate step-by-step plans as a guide to making
Practical skills and techniques	• use a range of construction kits including- lego, duplo, mobilo, magformers. popoids, marble run, wooden blocks,polydron, creative gears. • use a range of materials and components including: junk modelling, textiles, crates, food ingredients. • cut and shape materials • assemble and join materials-beginning to combine different materials and components.	• follow procedures for safety and hygiene • use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components • measure, mark out, cut and shape materials and components • assemble, join and combine materials and components • use finishing techniques, including those from art and design	follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components • measure, mark out, cut and shape materials and components with some accuracy • assemble, join and combine materials and components with some accuracy • apply a range of finishing techniques, including those from art and design, with some accuracy	follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components • accurately measure, mark out, cut and shape materials and components • accurately assemble, join and combine materials and components • accurately apply a range of finishing techniques, including those from art and design • use techniques that involve a number of steps • demonstrate resourcefulness when tackling practical problems
Evaluating	**EYFS**	**Key Stage 1**	**Lower Key Stage 2**	**Upper Key Stage 2**

Own ideas and products	• begin to talk about changes made during the making process, e.g. making a decision to use a different joining method.	• talk about their design ideas and what they are making • make simple judgements about their products and ideas against design criteria • suggest how their products could be improved	identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to improve their work In early KS2 pupils should also: • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products	• identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to improve their work critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • evaluate their ideas and products against their original design specification
Existing products	Through the use of Tinker Tables begin to explore by taking apart and reassembling them: • what products are • how products are used • how products work and are joined • what materials products are made from	pupils should explore: • what products are • who products are for • what products are for • how products work • how products are used • where products might be used • what materials products are made from • what they like and dislike about products	pupils should investigate and analyse: • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants In early KS2 pupils should also investigate and analyse: • who designed and made the products • where products were designed and made	pupils should investigate and analyse: • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants • 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

			• when products were designed and made • whether products can be recycled or reused	
Key events and individuals			• about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products	• about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products
Technical Knowledge	**EYFS**	**Key Stage 1**	**Lower Key Stage 2**	**Upper Key Stage 2**
Making products work	• to learn how to use a range of tools, e.g. scissors, hole punch, stapler, woodworking tools, rolling pins, pastry cutters. • learn how everyday objects work by dismantling things. • learn what is meant by strong/sturdy/structure/foundation	Across KS1 pupils should know: • about the simple working characteristics of materials and components • about the movement of simple mechanisms such as levers, sliders, wheels and axles • how freestanding structures can be made stronger, stiffer and more stable • that a 3-D textiles product can be assembled from two identical fabric shapes • that food ingredients should be combined according to their sensory characteristics	Across KS2 pupils should know: • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are	Across KS2 pupils should know: • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output

		• the correct technical vocabulary for the projects they are undertaking	undertaking In early KS2 pupils should also know: • how mechanical systems such as levers and linkages or pneumatic systems create movement • how simple electrical circuits and components can be used to create functional products • how to make strong, stiff shell structures • that a single fabric shape can be used to make a 3D textiles product • that food ingredients can be fresh, pre-cooked and processed	• the correct technical vocabulary for the projects they are undertaking ● how mechanical systems such as cams or pulleys or gears create movement • how more complex electrical circuits and components can be used to create functional products • how to program a computer to monitor changes in the environment and control their products. • how to reinforce and strengthen a 3D framework • that a 3D textiles product can be made from a combination of fabric shapes • that a recipe can be adapted by adding or substituting one or more ingredients
Cooking and Nutrition	**EYFS**	**Key Stage 1**	**Lower Key Stage 2**	**Upper Key Stage 2**
Where food comes from	● to begin to understand some of the tools, techniques and processes involved in food preparation.	that all food comes from plants or animals • that food has to be farmed, grown elsewhere (e.g. home) or caught	that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world	that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in

	● that vegetables and fruits are grown.			the UK, Europe and the wider world In late KS2 pupils should also know: • that seasons may affect the food available • how food is processed into ingredients that can be eaten or used in cooking
Food preparation, cooking and nutrition	● children have basic hygiene awareness- handwashing, washing home grown vegetables to remove mud ● what is meant by the word healthy. ● children understand when they are hungry or thirsty. ● to identify healthy and or unhealthy foods	• how to name and sort foods into the five groups in The eatwell plate • that everyone should eat at least five portions of fruit and vegetables every day • how to prepare simple dishes safely and hygienically, without using a heat source • how to use techniques such as cutting, peeling and grating	• how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking In early KS2 pupils should also know: • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eatwell plate • that to be active and healthy, food and drink are needed to provide energy for the body	how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking that recipes can be adapted to change the appearance, taste, texture and aroma • that different food and drink contain different substances – nutrients, water and fibre – that are needed for health