

The Meadows Primary School - DT - Hierarchy of Skills Development

DESIGNING	KEY STAGE 1	LOWER KS2	UPPER KS2
Understanding contexts, users and products	Across KS1 pupils should: • work confidently within a range of contexts e.g. imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment • state what products they are designing and making • say who their products are for: themselves or other users? • describe what their products are for (real-life context for learning) • say how their products will work and simply describe their choices • say how they will make their products suitable for their intended users • use simple design criteria to help develop their ideas (generated by class discussion or the class teacher at this stage)	Across KS2 pupils should: • 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 e.g. what is it for? How will the product fit the purpose? etc. • indicate the design features of their products and how they will appeal to intended users e.g. teenagers, grandparents, younger children etc. • explain how particular parts of their products work e.g. the motor spindle rotates and...	
		In lower KS2 pupils should also: • gather information about the needs and wants of particular individuals and groups • develop their own design criteria and use these to inform their ideas	In upper KS2 pupils should also: • 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	Across KS1 pupils should: • generate ideas by drawing on their own experiences e.g. what is your favourite fruit? Have you played with puppets? • use knowledge of existing products to help come up with ideas e.g. handling collection etc. • develop and communicate ideas by talking and drawing e.g. relevant questions to guide their thinking etc. • model ideas by exploring materials, components and construction kits and by making templates and mock-ups • use information and communication technology, where appropriate, to develop and communicate their ideas e.g. Paint, virtual construction kits etc.	Across KS2 pupils should: • share and clarify ideas through discussion • model their ideas using prototypes (to test and evaluate the form and function of their design ideas in three dimensions, before going on to create the final product) and pattern pieces (textiles) • 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	
		In lower KS2 pupils should also: • generate realistic ideas, focusing on the needs of the user • make design decisions that take account of the availability of resources	In upper KS2 pupils should also: • generate innovative ideas to show their original thinking, drawing on research • make design decisions, taking account of constraints such as time, resources and cost

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MAKING	KEY STAGE 1	LOWER KS2	UPPER KS2
Planning	Across KS1 pupils should: • plan by suggesting what to do next • select from a range of tools and equipment, explaining their choices • select from a range of materials and components according to their characteristics e.g. a warm fabric, a waterproof fabric etc.	Across KS2 pupils should: • 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 materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities e.g. sandpaper, wire strippers etc.	
		In lower KS2 pupils should also: • order the main stages of making e.g. photos, sketches/clip art etc.	In upper KS2 pupils should also: • produce appropriate lists of tools, equipment and materials they need • formulate step-by-step plans as a guide to making
Practical skills and techniques	Across KS1 pupils should: • 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 e.g. food, textiles, mechanical components etc. • assemble, join and combine materials and components e.g. masking tape, paper fasteners etc. • use finishing techniques, including those from art and design	Across KS2 pupils should: • 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	
		In lower KS2 pupils should also: • measure, mark out, cut and shape materials and components with some accuracy e.g. measuring in cm • 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	In upper KS2 pupils should also: • accurately measure, mark out, cut and shape materials and components e.g. measuring accurately in mm, using scale • 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

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EVALUATING	KEY STAGE 1	LOWER KS2	UPPER KS2
Own ideas and products	Across KS1 pupils should: • talk about their design ideas and what they are making e.g. talking about what they are intended to do, who they will be for and how they will work etc • make simple judgements about their products and ideas against design criteria (criteria generated as a class or given by class teacher) • suggest how their products could be improved	Across KS2 pupils should: • 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 lower KS2 pupils should also: • refer to their design criteria as they design and make and keep referring back to this during this stage • use their design criteria to evaluate their completed products	In upper KS2 pupils should also: • 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	Across KS1 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	Across KS2 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 lower KS2 pupils should also investigate and analyse: • who designed and made the products • where products were designed and made • when products were designed and made • whether products can be recycled or reused	In upper KS2 pupils should also 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
Key events and individuals	Not a requirement in KS1	Across KS2 pupils should know: • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products e.g. Thomas Telford, Thomas Edison, William Morris etc	

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TECHNICAL KNOWLEDGE	KEY STAGE 1	LOWER KS2	UPPER KS2
Making products work	Across KS1 pupils should know: • about the simple working characteristics of materials and components e.g. functional properties e.g. warm, waterproof or aesthetic qualities e.g. shiny or patterned etc. • about the movement of simple mechanisms such as levers, sliders, wheels and axles e.g. sliders which move in a straight line, levers which move in a curve and wheels and axles which turn etc. • 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 e.g. soft, sour, bitter, salty • the correct technical vocabulary for the projects they are undertaking	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	
		In lower 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 program a computer to control their products • how to make strong, stiff shell structures • that a single fabric shape can be used to make a 3D textile product • that food ingredients can be fresh, pre-cooked and processed	In upper KS2 pupils should also know: • 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

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COOKING AND NUTRITION	KEY STAGE 1	LOWER KS2	UPPER KS2
Where food comes from	Across KS1 pupils should know: • that all food comes from plants or animals • that food has to be farmed, grown elsewhere (e.g. home) or caught	Across KS2 pupils should know: • that a recipe can be adapted a by adding or substituting one or more ingredients • 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	
			In upper 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	Across KS1 pupils should know: • 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, grating, washing and juicing (e.g. snipping herbs and spring onions with kitchen scissors suitable for children's use)	Across KS2 pupils should know: • 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 lower 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	In upper KS2 pupils should also know: • 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