Progression of Skills in Design & Technology at MPS

Intent

To inspire children through a broad range of practical experiences to create innovative designs which solve real and relevant problems within a variety of different contexts. The iterative design process is fundamental and runs throughout all planning. This iterative process encourages children to identify real and relevant problems, critically evaluate existing products and then take risks and innovate when designing and creating solutions to the problems. As part of the iterative process, time is built in to reflect, evaluate and improve on prototypes using design criteria throughout to support this process. Opportunities are provided for children to evaluate key events and individuals who have helped shape the world, showing the real impact of design and technology on the wider environment and helping to inspire children to become the next generation of innovators.

Implementation

Design and Technology skills and understanding are built into lessons, following an iterative process. However, this is not to say that this structure should be followed rigidly: it allows for the revision of ideas to become part of good practice and ultimately helps to build a depth to children's understanding. Through revisiting and consolidating skills, lesson plans and resources help children build on prior knowledge alongside introducing new skills, knowledge and challenge. The revision and introduction of key vocabulary should be built into each lesson. This vocabulary should be in display materials and additional resources to ensure that children are allowed opportunities to repeat and revise this knowledge.

Impact

The impact of using the full range of resources, including display materials, will be seen across the school with an increase in the profile of Design and Technology. The learning environment across the school will be more consistent with design and technology technical vocabulary displayed, spoken and used by all learners. Whole-school and parental engagement will be improved through the use of design and technology-specific home learning tasks and opportunities suggested in lessons and overviews for wider learning. We want to ensure that Design and Technology is loved by teachers and pupils across school, therefore encouraging them to want to continue building on this wealth of skills and understanding, now and in the future. Impact can also be measured through key questioning skills built into lessons, child-led assessment such as success criteria grids, jigsaw targets and KWL grids and summative assessments aimed at targeting next steps in learning.

Progression of Skills in Design & Technology at MPS

		Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design	**Understanding contexts, users and purposes**	*Across KS1 pupils:* • 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 • describe what their products are for • say how their products will work • say how they will make their products suitable for their intended users • use simple design criteria to help develop their ideas		*In lower KS2 pupils:* • 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:* • 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:* • 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		*Across KS2 pupils:* • 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			
				In lower KS2 pupils 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 also:* • generate innovative ideas, drawing on research • make design decisions, taking account of constraints such as time, resources and cost	
Make	**Planning**	*Across KS1 pupils:* • 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		*Across KS2 pupils:* • 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			

Progression of Skills in Design & Technology at MPS

			In lower KS2 pupils: • order the main stages of making	*In upper KS2 pupils:* • 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	*Across KS1 pupils:* • 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	*Across KS2 pupils:* • 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: • 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	*In upper KS2 pupils:* • 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
	Own ideas and products	*Across KS1 pupils:* • 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	*Across KS2 pupils:* • 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 also: • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products	*In upper KS2 pupils 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

Progression of Skills in Design & Technology at MPS

<table>
<tr><td rowspan="2">Evaluate</td><td rowspan="2">Existing Products</td><td rowspan="2">Across KS1 pupils know :
• what products are for
• who 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</td><td colspan="2">Across KS2 pupils know:
• 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</td></tr>
<tr><td>In lower KS2 pupils 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</td><td>In upper KS2 pupils 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</td></tr>
<tr><td rowspan="2">Technical Knowledge</td><td rowspan="2">Making products work</td><td rowspan="2">Across KS1 pupils 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
• the correct technical vocabulary for the projects they are undertaking</td><td colspan="2">Across KS2 pupils 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</td></tr>
<tr><td>In lower KS2 pupils 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</td><td>In upper KS2 pupils 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</td></tr>
</table>

Progression of Skills in Design & Technology at MPS

			control their 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	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	**Where food comes from**	*Across KS1 pupils 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 know:* • 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 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 know:* • how to name and sort foods into the five groups in The eat well 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	*Across KS2 pupils 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 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 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