

Sparkenhoe Design and Technology Curriculum

Subject Rationale

Children start school with a mixture of skills, whilst some will have used practical tools and solved problems through designing solutions, others will have had very limited opportunity to build these skills. Children may have had some limited experience of very basic construction at home and might have a notion of why something is useful or not.

Through a curriculum that progressively builds up skills through practical opportunities and real life problems, the children will learn the basic skills of design, construction and evaluation throughout their time at school. In the early years, children explore and construct using their imagination and develop problem solving skills. Throughout KS1, the children will formalise their DT learning by unpicking the designs of very well-known objects (houses, toys and cars) before expanding this further to include more abstract and challenging designs in KS2. Throughout all of these topics the children will learn the design process in increasing detail; from initial ideas to solve a problem, brief creation, evaluation of current products, design, prototypes, construction and evaluation. Underpinning these are the children's knowledge of some famous designs in history and their learning to use a variety of increasingly difficult construction skills. Ultimately, the children will be able to look at an object and begin to be able to unpick the thought processes behind it, evaluate it and think about its construction. They will also have learnt some famous designs and basic construction skills that will help them throughout their lives and have a basic understanding of how things work.

In terms of food preparation and cooking, the children begin school having observed a range of home cooking, particularly traditional meals from the Indian subcontinent, Africa and the Middle East. They have experiences of shopping for food although not always fresh ingredients. They will learn the basics of food technology and hygiene whilst also learning to make a range of recipes safely. By the end of year 6, our children will be able to identify common ingredients and know how they are produced. They will be able to use a range of techniques (peeling, cutting, mixing, boiling, roasting, baking) to cook a range of healthy meals by following a recipe. They will know how to be safe and hygienic in a kitchen, including storing different foods correctly.

This will provide children with the ability to see how the world around them works more effectively, solve real life problems and give them the foundations to build upon and take their DT further in their secondary education.

Organisation

In the Foundation Stage, DT is taught through exploration of different topics and through provision. Children develop their creativity through planned and child initiated activities. In KS1 and KS2, DT is taught as part of our Topic Curriculum. Across a year, there are 5 units of 7 weeks. Each topic comprises of two subjects which are linked together by an overarching theme. In KS1 there are 6 DT units and in KS2 there are 10, through which the National Curriculum art objectives are taught. Lessons are taught in 50 minute blocks with two or three lessons a week in each block. Teachers have the flexibility to reorganise timetables to create longer sessions if this leads to more effective learning. For example, they may spend an entire morning designing and making, rather than revisiting it over a few days.

Each unit comprises of a Medium Term plan, which details the rationale for the unit, the progression from previous linked units and all the relevant objectives. To ensure progression across different year groups, the National Curriculum has been broken down into incremental statements. The children learn a series of specific skills and knowledge that lead to at least one outcome which gives an opportunity to use the skills and knowledge. Alongside this, each unit has a "Spectacular", an event which ties together the learning in the topic and gives a real life purpose to it.

Foundation Stage

Through a variety of planned and changing topics that are related to the children's interests, the children will:

	Foundation 1	Foundation 2
Expressive Arts and Design Creating with Materials	<ul style="list-style-type: none"> Explore different materials freely, to develop ideas about how to use them and what to make. Develop own ideas and decide which materials to use to express them. Join different materials and explore different textures. 	<ul style="list-style-type: none"> Explore, use and refine a variety of artistic effects to express ideas and feelings. Return to and build upon previous learning, refining ideas and developing ability to represent them. Create collaboratively, sharing ideas, resources and skills. Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share creations, explaining the process used.
Physical Development Fine Motor Skills	<ul style="list-style-type: none"> Use one-handed tools and equipment, for example, making snips in paper with scissors. 	<ul style="list-style-type: none"> Begin to show accuracy and care when drawing. Use a range of small tools, including scissors, paint brushes and cutlery
Personal, Social and Emotional Development Managing self	<ul style="list-style-type: none"> Make health choices about food and drink. 	<ul style="list-style-type: none"> Manage basic hygiene and personal needs and understands the importance of healthy food choices.

Key Stage 1

The topics in Key Stage 1 focus primarily on known structures or products that can have a stripped down design, and some basic design principles (wheels are most effective when they are round etc). The emphasis through Year 1 is more on functionality than aesthetics and the children are guided through the design cycle. In Year 2 children build on earlier skills and begin to look at aesthetics and design criteria. In Cooking and Nutrition, the children make some basic recipes, which require the use of basic preparation skills and do not require cooking using an oven or stove.

Year 1	<p style="text-align: center;"><u>Hot Wheels</u></p> <p>Children investigate dismantling and exploring cars – both Lego cars and other modelling toys. They will know how the wheels on a car turn on an axle through these investigations of simple car design. They will create a simple criteria for a design of a car and make their own design, shown through use of words and pictures. The children will also learn some cutting and joining skills. These will then be used to make a car that moves when pushed. They will be able to explain how their design meets the criteria and describe how it works.</p> <p>Outcome: Soap Box Derby</p>	<p style="text-align: center;"><u>Castles</u></p> <p>Children will begin by looking at the common features of different castles and creating a list of design specifications that their own creation will satisfy. Through investigation, they will learn that different materials have different properties that make them more suitable for making structures. Through exploration of a variety of joining techniques, the children will be able to manipulate their materials to join more effectively – using tabs, slots and flange joins. The children will design junk model castles, ensuring they stick to the design criteria, labelling the joins and listing the equipment. Finally the children will orally evaluate their designs against the criteria they created.</p> <p>Outcome: Castles day for parents</p>	<p style="text-align: center;"><u>The Great Outdoors</u></p> <p>Children learn about different cultural eating traditions, from sitting around a table, being seated on the floor, low tables and seating and picnics. They will discuss the differences between the types of food eaten at home and the types of food taken on picnics and look at common picnic food. By exploring some of the different fare taken on picnics, the children will begin to compare different nutritional value of food. They will also identify where and how the foods are produced, focusing on which vegetables are in season for the summer (linked to Seasonal Changes Science). Finally, they will design a simple, seasonal and healthy picnic, before making some aspects of it to take with them on their trip.</p> <p>Outcome: Picnic in the park</p>
Year 2	<p style="text-align: center;"><u>Puppets</u></p> <p>Children will know the different types of puppets used at different periods in history. They will be able to deconstruct them, understand how they work, be able to describe the mechanisms of them and evaluate how effective they are. Using this information, the children will create a success criteria. They will be able to design and make their own puppet for a role in their final show, exploring how to stiffen cardboard, measure and cut. The puppet they make will involve a slider or lever to help move part of it. They will evaluate how it has fulfilled the success criteria.</p> <p>Outcome: Puppet Show</p>	<p style="text-align: center;"><u>Wonders of the World</u></p> <p>Children will focus on the Pyramids of Giza. They will explore structural stability, look at nets of pyramids and create their own Lego pyramids. The children will explore how the pyramids originally looked and how they are now used as a tool to promote and share messages with projection. The children will unpick what makes an effective promotional image and create a success criteria for one. They will design a “skin” for their pyramid that promotes an environmental issue such as climate change. The children will make a simple frame for a pyramid using lolly sticks, focusing on the joins and measurements. They will make a set of triangular frames to join together to make their own pyramid and add their “skin” to clad the project. Ultimately, they evaluate their design against the initial criteria.</p> <p>Outcome: Exhibition</p>	<p style="text-align: center;"><u>Japan</u></p> <p>Children learn about the different Japanese traditional foods and why their diet is considered to be so healthy. Focusing on Sushi, the children will explore different ingredients and design their own vegetarian rainbow sushi. They will learn different cutting and chopping techniques for different vegetables. They will also explore which vegetables are in season, how to safely prepare sushi rice, how to roll sushi and ultimately create their own.</p> <p>Outcome: Infant Master Chef</p>
<p>Within the DT progression map and medium term plans, objectives are broken down into incremental statements to ensure skills and knowledge are built upon and progression is clear.</p> <p>For example, in the Wonders of the World unit, Year 2 children extend their understanding of cutting and joining in different ways and begin to focus on aesthetics of designs. They build upon earlier work on design criteria and apply it to a different type of project.</p>			

Key Stage 2

As the children move through Key Stage 2, they learn about different topics, using more technically challenging DT skills and explore some more challenging mechanics. They unpick the work of some famous designers and designs, looking closely at how and why these are effective. The design cycle becomes more of a focus as the children start to use it independently and looking in more detail at each stage, becoming more technical. Children also begin to use different ways to show their ideas, using a wider variety of ways to display their thoughts. In Cooking and Nutrition, the children make more technically difficult dishes, starting to use a wider variety of techniques and ingredients. Combined with a growing understanding of nutrition, this allows the children to take known recipes and tweak them to make healthier versions.

Year 3	<p style="text-align: center;"><u>Meet the Ancestors</u></p> <p>Children will know how wheels were used in the Stone Age and why the circle is the most effective shape to use by exploration and research. They will be able to look at existing evidence of Stone Age carts and carefully unpick how they were constructed, thinking about the decisions that were made. From this they will be able to create design criteria. The children will then design their own cart to fit a brief tied to the End of Unit Spectacular of a cart that travels well and supports a significant weight, using sketches and cross sectional diagrams. Finally they will be able to construct their own cart, with accuracy, selecting materials used. Through a series of independent tasks they will refine their marking, cutting and assembly skills. Their carts will be tested and evaluated against the original criteria.</p> <p>Outcome: Cart Day</p>	<p style="text-align: center;"><u>Coming to America!</u></p> <p>Children will explore different dishes from the USA, evaluating their nutritional value. They will focus on the dish of Peach Cobbler, looking at the recipe to identify which ingredients could be swapped to make it healthier. They will compare their decisions to a healthy recipe for Peach Cobbler. The children will explore alternatives for peaches as these are not in season and contribute to the food miles of the recipe and evaluate tinned goods as a way of eating preserved food. They will be able to use the tools appropriately, understand where the ingredients of the dish have come from and how it fits in with a balanced diet, ultimately making and tasting their own Cobbler.</p> <p>Outcome: American Party</p>	<p style="text-align: center;"><u>Moving Monsters</u></p> <p>Children will explore some simple pneumatic systems and how air is used in everyday devices such as bike pumps, balloons, party blowers. Through a number of focused tasks, they will investigate how to construct simple pneumatic systems using tubes, balloons and syringes and recap on hinges from their previous work on Puppets in year 2. The children will then evaluate and unpick pneumatic monsters and create a success criteria for their own designs. They will then design their own monster, using annotated sketches, that incorporates a pneumatic system to move part of the monster. They will make their monster, following their design and decorate it. Finally, they will evaluate their monster against their success criteria.</p> <p>Outcome: Monster Exhibition</p>
Year 4	<p style="text-align: center;"><u>Coast to Coast</u></p> <p>Children explore lighthouse designs, looking at how these fit the function of the structure. They will know how the design supports its primary function of signalling danger over a long distance, how it is structurally sound and how the shape prevents damage from the elements. They will explore different pulley systems before designing their own lighthouses, considering the joins between the structure and the ground, how they will incorporate an electrical circuit with a light and a pulley to take food to the top of their lighthouse. They explore what internal structures need to be in place to ensure that the lighthouse is stable and strong and that the pulley moves. They will be able to explain how their design fits the criteria and what improvements they could make.</p> <p>Outcome: Model Lighthouse</p>	<p style="text-align: center;"><u>Ancient Mayans</u></p> <p>Children learn about traditional Mexican food and its roots in the Mayan culture. They will look specifically at the Mole Poblano and how this takes its inspiration from indigenous plants of Mexico. Through investigations into different types of chocolate, the children will be able to explain what specific ingredients make varieties of chocolate have different nutritional values. The children will take the basics of the recipe and create a vegetarian alternative, selecting seasonal vegetables to be part their dish. They will also make corn tortillas to accompany the sauce using corn flour. They will use a variety of preparation techniques and cooking techniques to make their final dish.</p>	

Year 5	<p style="text-align: center;"><u>Vicious Vikings</u></p> <p>The children will learn about CAM mechanisms, how they are put together, how they create movement and how they can be used to show different aspects of Viking life. They will be able to identify design features, both aesthetic and practical, and use these to develop a set of success criteria. Through some focused sessions and investigations, the children will establish how mechanisms can transfer movements and how the shape of the CAM effects the movement. They will select the shape of CAM they need for their display and design the top portion to enable movement. They will consider the number of CAMS they need for their scene. The children will use a brief design that is focused on the CAM mechanism. They will be able to evaluate their design against the criteria, detailing successes and possible improvements.</p> <p>Outcome: Hands on exhibition</p>	<p style="text-align: center;"><u>Architectural Wonders</u></p> <p>Children learn about a variety of different UK and international architectural landmarks. They will describe them in terms of aesthetics, talk about how they are structured and what they are made from. They will develop their own success criteria generated from a need for a landmark building in Leicester. They will apply what they have learnt from a number of focused tasks to design and create their own architectural wonder that is both structurally sound and aesthetically pleasing. The children will present their structures to a panel of judges explaining the decisions they made, the materials they chose, how they made it structurally sound and the choices behind the design. They will evaluate this in detail, proposing changes and discussing successes.</p> <p>Outcome: Dragon' Den</p>	<p style="text-align: center;"><u>The Victorians</u></p> <p>Children learn about the food the Victorians ate, where it came from and how it was prepared. They will explore some of stranger things that people ate during this time and then focus on the desserts. They will look at the differences between the diets of the rich and poor, before following a recipe for a decadent Swiss Roll. They will investigate how to make the recipe healthier and whether this impacts on the taste, making different versions and comparing them.</p> <p>Outcome: Victorian Day</p>
Year 6	<p style="text-align: center;"><u>Bella Italia</u></p> <p>Children learn about a variety of traditional Italian food and evaluate it in terms of its place in a healthy diet. This is linked to the fact that the Mediterranean diet is recognised for its nutritional benefits. They will evaluate pizzas from takeaway establishments, supermarkets and ones that are homemade. Taking a traditional pizza recipe, the children will make healthy choices and adjust their individual recipes accordingly. They will make the dough from scratch, before adding toppings to make a healthy pizza.</p> <p>Outcome: Food and Travel TV programme</p>	<p style="text-align: center;"><u>World War</u></p> <p>Children learn about some of the bridges used or captured in WW1 and WW2, what their purpose was and how their construction facilitated this. They will know how to strengthen structures in a variety of different ways and explore mechanisms for bridges that open. They will be able to make a design brief based on the properties of a Bascule Bridge or other bridge with moving parts. They will design and make a bridge that can stretch across a void, take a weight and uses a gear or pulley system. Finally, they will be able to evaluate their bridge in terms of its strength and ease of construction.</p> <p>Outcome: Bridge Building</p>	
<p>Within the DT progression map and medium term plans, objectives are broken down into incremental statements to ensure skills and knowledge are built upon and progression is clear.</p> <p>For example the Year 6 Bella Italia unit builds upon the previous work on cultural foods and substituting ingredients in recipes. Children will apply previous learning to follow a more complex recipe and make decisions based on personal choices and their knowledge of nutrition and healthy choices.</p>			