Design and Technology

Design and Technology

Mersey Park Primary School

Be Nice

Work Hard

Never Give Up

Design and Technology at Mersey Park Primary School

What we teach

The Design and Technology curriculum at Mersey Park Primary School follows the requirements of the National Curriculum and the Statutory Framework for the Early Years Foundation Stage. It provides our pupils with the opportunity to tackle problems of a practical nature and develop a range of tool skills. The cross curricular nature of Design and Technology offers a setting for children to apply knowledge and skills linked to other subjects. Skills are developed in using a range of materials (including textiles), tools, mechanics and electrical and digital systems. We use these skills to design and make structures, mechanisms and textiles and food products. Children work collaboratively – discussing their design ideas; working cooperatively to make their products; evaluating their own work and the products of others. We also encourage pupils to look to the wider world of product design, exploring the work of significant designers, inventors or developments.

Curriculum progression is clearly set out in our Progression of Skills planning document, which follows the National Curriculum objectives. It has been carefully structured to allow frequent opportunities for children to practice and embed key skills and knowledge. From Foundation Stage onwards we plan opportunities for our children to explore materials, practice their construction and design skills and express themselves creatively. This is an experience we feel many of our children need when beginning their journey as designers and engineers at Mersey Park.

Much of our Design and Technology is taught in timetabled blocks, so children are fully immersed in the whole design process and get the opportunity to practice a range of skills and express their creative ideas in a supportive, safe environment.

We ensure that we meet the needs of all pupils, allowing them the opportunity to access the full and broad curriculum through carefully planned support and adaptation as required.

How we teach it

From Foundation Stage through to Year 6, pupils are given opportunities to explore the use of materials and tools; to design and make prototypes; to discuss how things work; and to apply their knowledge to how they could be improved. They are presented with design problems to solve, working as part of a team. Design and Technology is taught through areas of learning in accordance with EYFS documents and the National Curriculum for KS1 and KS2.

The areas of design and making covered by each year group are:

- Food Technology – emphasis is on healthy eating and a progression of skills using a variety of cooking techniques, including boiling, stir-frying, baking and grilling, and the safe use of kitchen equipment and appliances.
- Structures – emphasis is on using wooden Jinx frame constructions as a basis for products.
- Mechanisms – this element is incorporated into the products made during the structures topic and includes: levers/sliders, chassis/axles/wheels, cams and gears.
- Textiles – emphasis is on sewing skills, progressively taught across each key stage and including fastenings and other design elements to make a product appealing.
- Electrical Systems (Key Stage 2 only) – applying their knowledge of circuits and incorporating these to enhance their product to include light or sound.
- Digital World (Key Stage 2 only) – using technology to create a digital product.

A strong focus for teaching is the use of correct technical vocabulary. Teachers plan the language they use during their sessions and model, through high quality shared texts and discussion, specific technical vocabulary to help embed this language in the children's long-term memory. Knowledge organisers highlight key knowledge, vocabulary and significant designers in each unit. The attainment of skills are also reinforced through the use of videos created by school staff which introduce and revise basic skills. Teachers are provided with regular opportunities to develop their own subject knowledge through sharing good practice, peer observation and visiting experts. We also make use of our own, in school, experts to provide support and help to teach topics.

From Year 1 to Year 6, children will develop an individual DT Portfolio, which includes their DT booklets from each unit. These booklets allow the pupils to record their research, design, final product and evaluations. As they build their portfolio the children are able to continually reflect and revise previous products, skills and learning.

Pupils have the opportunity to access DT themed extra curricular clubs, such as Cookery Club, Gardening Club and Textiles Club.

Final end of year assessments are made using criteria that have been developed in line with the National Curriculum, to identify the level at which the child is working. Children in Foundation Stage are assessed within Expressive Arts and Design and their progress is tracked termly. Age related expectation levels are reported to parents at the end of each year. The teaching of the use of tools, cooking equipment, sewing equipment and electrical and digital systems is progressive, building year on year, to ensure that by the end of Key Stage 2, pupils have a full range of skills and know how to use equipment safely.

SMSC through Design and Technology

The teaching of design technology offers opportunities to support the social development of our children through the way we expect them to work with each other in lessons. Children are given the chance to discuss their ideas and opinions about their work and the

work of others. The children develop respect for the abilities of other children. They also develop respect for the environment, for their own health and safety and for that of others.
The children study the work of designers from various different countries and ethnic backgrounds. Through discussions and critiques they are able to make judgements and express personal views.

Impact

Design and Technology is monitored through a variety of strategies, including: planning and evaluation scrutiny, lesson observation and product scrutiny. Summative assessments take place throughout the year and teachers record the progress and attainment against the National Curriculum. Teachers use this information to inform future lessons; ensuring children are supported and challenged appropriately. This data is analysed regularly to inform and address any trends or gaps in attainment. Information is also gathered through pupil voice, which highlight both strengths and achievements and the knowledge and skills that require further work in order to be embedded.

Food Technology is incorporated into Healthy Eating Week and there are opportunities for children to sample their cooking and take it home. We also aim to use home grown produce from our school gardens and allotment and send recipes home to encourage families to cook the dishes the children have made in school. The children will experience the whole design process from the issue, through planning, trial and error prototypes, finished products and evaluation to see if further improvements are necessary.

Design and Technology Subject Overview

	Autumn	Spring	Summer
F1	Continuous access to the workshop and construction area. Children have opportunities to develop their own ideas and design and make specific items linked to the topic/theme, e.g. baskets, bags, belts, hats and masks. Children explore different materials and experiment with different ways of joining them. They refine their use of scissors, ensuring they handle them safely. Throughout the year the children's skills will become increasingly refined and they will evaluate and make adaptations to the products they have made. Children have opportunities to prepare and cook a range of recipes linked to the current theme or topic.		
F2	Continuous access to the workshop and construction area, enhanced with theme/topic resources. **Pumpkin Soup** – making a soup inspired by our book	Continuous access to the workshop and construction area, enhanced with theme/topic resources. **Chinese New Year** – Making a Chinese dragon and lanterns. **Winter** - Making earmuffs	Continuous access to the workshop and construction area, enhanced with theme/topic resources. **Pirates** – Making pirate hats and patches. **Jack and the Beanstalk** – Making ladders for Jack
Year 1	**Textiles** Hand Puppet (History - Toys)	**Cooking and Nutrition** Watermelon Pizza (Geography - Food)	**Mechanisms/ Structures – Levers and Sliders** Seaside scene with moving parts and wooden photo frame. (Geography/History - Seaside)
Year 2	**Cooking and Nutrition** Potato and herb salad (Healthy Eating week)	**Structures/ Mechanisms – Wheels and Axles** Moving vehicle (History - Transport) with a Jinx frame base	**Textiles** Medal Pouch (History - Time Detectives)
Year 3	**Mechanisms – Levers and Linkages** Information book (Geography - Unique UK)	**Cooking and Nutrition** A main course – Scouse (Geography - Liverpool)	**Textiles** Pin cushion (History - Victorians)
Year 4	**Cooking and Nutrition** Ragu (Geography - Passport to Europe)	**Textiles** Soft toy - rabbit (Literacy- Edward Tulane)	**Structures/ Electrical Systems** Illuminated sign and stand (PSHE - School Values)
Year 5	**Cooking and Nutrition** Greek Food: Gyros (Geography - Greece)	**Textiles** Water bottle carrier (Geography - Our Natural World)	**Structures/ Mechanisms - Cams** Wooden toy with cam mechanism (Science – Living Things and their Habitats)
Year 6	**Cooking and Nutrition** Come Dine with Me - fajita, stir fry, curry (Healthy Eating Week)	**Structures/ Electrical Systems** Steady Hand Game (Science – Electricity)	**Textiles** Storage case for high school - pencils/phone/iPad (Transition)

Design and Technology - Early Years

Development Matters

Birth to Three

Physical Development:
- Build independently with a range of appropriate resources
- Develop manipulation and control.
- Explore different materials and tools

Mathematics:
- Build with a range of resources.

Understanding the World:
- Explore materials with different properties.

Expressive art and design:
- Explore different materials, using all their senses to investigate them.
- Manipulate and play with different materials.
- Use their imagination as they consider what they can do with different materials.
- Make simple models which express their ideas.

Three and Four Year Olds (Foundation 1)

Personal, Social and Emotional Development:
- Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen or one which is suggested to them.

Physical Development:
- Use large-muscle movements to wave flags and streamers, paint and make marks.
- Choose the right resources to carry out their own plan.
- Use one-handed tools and equipment, for example, making snips in paper with scissors.

Understanding the World:
- Explore how things work.

Expressive Art and Design:
- Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park.
- Explore different materials freely, in order to develop their ideas about how to use them and what to make.
- Develop their own ideas and then decide which materials to use to express them.
- Create closed shapes with continuous lines, and begin to use these shapes to represent objects.

Children in Foundation 2

Physical Development:
- Progress towards a more fluent style of moving, with developing control and grace.
- Develop their small motor skills so that they can use a range of tools competently, safely and confidently.
- Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.

Expressive Art and Design:
- Explore, use and refine a variety of artistic effects to express their ideas and feelings.
- Return to and build on their previous learning, refining ideas and developing their ability to represent them.
- Create collaboratively, sharing ideas, resources and skills.

Early Learning Goals

Physical Development:
- Use a range of small tools, including scissors, paintbrushes and cutlery.

Expressive Art and Design:
- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
- Share their creations, explaining the process they have used.

Design and Technology National Curriculum Subject Content

Key Stage 1

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process* of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

When designing and making, pupils should be taught to:

Design:

- Design purposeful, functional, appealing products for themselves and other users based on design criteria
- Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

Make:

- Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

Evaluate:

- Explore and evaluate a range of existing products
- Evaluate their ideas and products against design criteria

Technical knowledge:

- Build structures, exploring how they can be made stronger, stiffer and more stable
- Explore and use mechanisms [for example, levers, sliders, wheels and axles, in their products.

* The iterative process is **an approach that designers use to continually improve a design or product**. Designers create a prototype and test it, then tweak and test the revised prototype, and repeat this cycle until they reach a solution.

Key Stage 2

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process* of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

Design:

- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make:

- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate:

- Investigate and analyse a range of existing products
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- Understand how key events and individuals in design and technology have helped shape the world

Technical knowledge:

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- Apply their understanding of computing to program, monitor and control their products.

* The iterative process is **an approach that designers use to continually improve a design or product**. Designers create a prototype and test it, then tweak and test the revised prototype, and repeat this cycle until they reach a solution.

Cooking and Nutrition at Key Stage 1 and 2

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

Key Stage 1

- Use the basic principles of a healthy and varied diet to prepare dishes
- Understand where food comes from.

Key Stage 2

- Understand and apply the principles of a healthy and varied diet
- Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques
- Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.