



Straits Primary School

Design and Technology Policy

Our intent is that children at Straits Primary School will learn what it means to be a great designer and they will be encouraged to become innovators and risk-takers. Children will use their creativity and imagination to research, design and make products that solve real and relevant problems within a variety of contexts, both independently and in collaboration with others. They will apply subject specific knowledge and make links to other curriculum areas such as mathematics, science, engineering, computing and art. Children will combine practical skills with an understanding of aesthetic, social and environmental issues, as well as functions and industry. They will be given opportunities to reflect upon and evaluate past and present technology, its uses and its effectiveness. Children will also be taught to critically evaluate their product against their original design criteria and refine their work accordingly.

Aims

Straits Primary School aims to provide engaging and inspirational teaching of Design and Technology. Our aims for our children are that they will:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world;
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users;
- critique, evaluate and test their ideas and products and the work of others;
- understand and apply the principles of nutrition and learn how to cook;

To meet these aims, the school will:

- Ensure our Design and Technology curriculum is sequenced effectively and identifies a clear progression of skills.
- Take an active role in developing staff skills through training opportunities.
- Provide engaging resources, trips and visits from experts to enable children to get 'hands-on' experience.
- Monitor and review the implementation of Design and Technology and amend our provision in light of this.

Design and Technology Curriculum

We follow the National Curriculum programme of study as the basis of all our planning in Design and Technology. The National Curriculum aims to ensure that all pupils:

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 such as the home and school, gardens and playgrounds, the local community, industry and the wider environment.

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

Cooking and nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. When cooking, children will be taught to:

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

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 such as the home, school, leisure, culture, enterprise, industry and the wider environment.

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
- investigate and analyse a range of existing products

Evaluate

- 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
- apply their understanding of how to strengthen, stiffen and reinforce more complex structures

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

Cooking and nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. When cooking, children will be taught to:

- 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.

Early Years Foundation Stage

In the foundation stage, Design and Technology falls under the headings 'Expressive arts and design' and 'Physical Development'. This covers the subjects Design and Technology, Music and dance, Art and Imaginative play. It is important for children to engage with Design and Technology regularly and to explore a range of materials and media to help children gain knowledge and understanding of their world. This helps them to work towards the early learning goals, such as safely using and exploring a variety of materials, tools and techniques. High-quality practice in the early years stimulates children's interest and imagination in the materials and media they encounter and provides the necessary foundations for future learning.

Design and Technology mainly falls under the sub-category 'Creating with Materials' and 'Fine Motor Skills'. In Early Years Foundation Stage, Design and Technology involves putting ideas into practice and having an awareness of the possibilities and limitations of different materials. Children will experience at first hand the consequences of the decisions they have made, rather than quickly being shown by an adult how to get it 'right'. Purposeful making involves creativity, imagination and fun - as well as making mistakes. They will be encouraged to explore, observe, solve problems, think critically, make decisions and to talk about why they have made their decisions.

By the end of the Foundation Stage, our children work towards achieving the Early Learning Goal in 'Creating with Materials' and 'Fine Motor Skills'. Children reaching this benchmark are expected to 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, make use of props and materials when role playing characters in narratives and stories, use a range of small tools, including scissors, paint brushes and cutlery, hold a pencil effectively in preparation for fluent writing – using the tripod grip in almost all cases and begin to show accuracy and care when drawing. We teach Design and Technology as an integral part of the topic work through child-initiated and adult-led activities.

Planning

In the Foundation Stage, elements of Design and Technology are ongoing and fall under the heading 'Expressive arts and Design and Physical Development'.

In KS1 and KS2 each year group plans and delivers their own Design and Technology lessons. Our long-term Programme of Study Overview and medium-term plans map out the skills and objectives covered each term for each year group. These plans ensure progression and coverage of the Design and Technology National Curriculum programmes of study. We teach our children to use appropriate technical language and vocabulary. Teachers' planning also shows due regard to our health and safety policy. The teaching of Design and Technology across the school promotes how to take risks, becoming resourceful, innovative, enterprising and capable citizens.

For years 1 – 6, we follow the National Curriculum as defined by the Department for Education. The Design and Technology curriculum is underpinned by providing our children with wider opportunities, independent learning and basic skills.

Implementation

Design and Technology is taught weekly in three half term units across the year. Teachers will explicitly introduce each lesson as a discrete Design and Technology lesson incorporating a blended approach to the teaching of **practical knowledge, theoretical knowledge and disciplinary knowledge**.

Practical knowledge

Practical knowledge is acquired through hands-on experience. This allows pupils to make choices based on what they know about the limits and possibilities of materials and media. This is recognised through different areas:

- drawing
- painting
- printmaking
- sculpture
- ceramics
- creative craft

- collage
- textiles
- digital and new media
- design and graphic design

Practical knowledge also includes the various components of artistic practice. These are the elements of practical knowledge that give pupils the ability to represent physically whatever they have envisaged. These skills, techniques and practices learned in the curriculum are underpinned by specialist and subject-specific knowledge. In each area of making, pupils learn about materials and techniques, the vocabulary to identify them and how they themselves can use those materials and put those techniques into practice.

Theoretical Knowledge

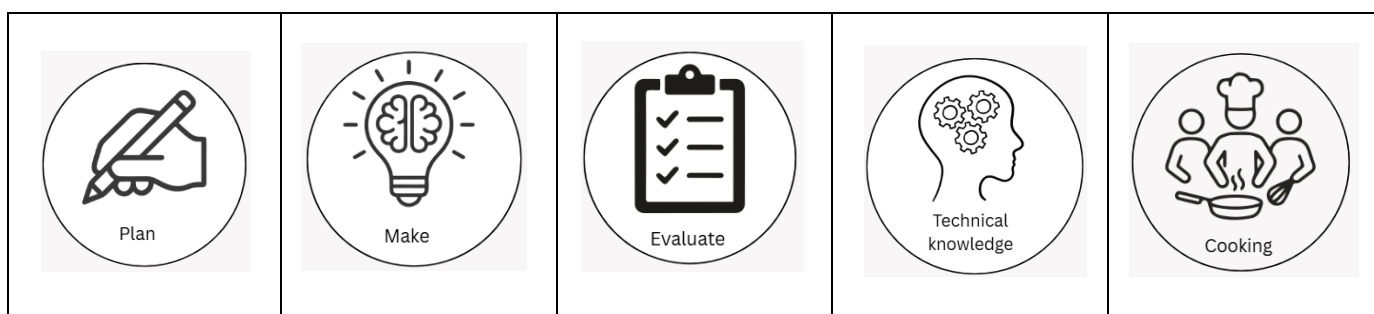
Theoretical knowledge puts into context much of the practical knowledge that they learn in the art and design curriculum. The national curriculum and other Design and Technology education literature present this through three interrelated forms:

- meaning and interpretations
- materials and processes
- journeys and connections through time

Disciplinary Knowledge

Disciplinary knowledge is the understanding of how knowledge is established, tested, and revised within a Design and Technology, rather than just the facts themselves. It captures the idea that, through the curriculum, pupils learn:

- how aesthetic judgements are formed and claimed
- how art is studied
- how to participate in the discourses of artists, scholars and critics



Teaching and learning Styles.

We use a variety of teaching and learning approaches in Design and Technology. Our principal aim is to develop the children's knowledge, skills and understanding and provide them with an opportunity to practise and apply skills taught - we do this through a mixture of whole-class teaching and individual/group activities. Within lessons, we give the children the opportunity both to collaborate and to compete with each other.

Assessment, recording and reporting.

Teachers assess Design and Technology in line with the assessment and marking policies of the school. We use assessment as an integral part of our teaching process and use it to inform future planning and to facilitate differentiation. Teachers will make a termly assessment of children's progress against the skills required for their own year group. Assessment is on-going to check the pupils' understanding of the topic and ensure progress is being made.

- Children demonstrate their ability in Design and Technology in a variety of different ways and teachers assess accordingly. Teachers will assess children's work by making informal judgements during lessons to move forward each individual child's learning.
- On completion of a piece of work, the teacher marks and assesses the work and uses this to inform future planning. Written or verbal feedback is given to the child to help guide their progress. All children are encouraged to make judgments about how they can improve their own work.
- Lessons are evaluated by the class teacher, identifying individual progress and informing future planning.
- Rapid recalls are used at the start of each lesson to ensure knowledge is being secured and to identify any gaps in learning.
- Parents are made aware of their child's progress through parents evening and the annual written report.
- The school website, displays and newsletters are used to show examples of work and photos of trips and visitors relevant to the topic being studied.
- Knowledge organisers are displayed on the school website.

Monitoring and review

Monitoring and reviewing the implementation of the Design and Technology curriculum and amending our provision in light of this are the responsibility of the Design and Technology subject leaders, supported by our Curriculum Lead. Monitoring will take place in line with the school's curriculum development calendar. It will be an on-going and informative process designed to measure impact of any development work, identify strengths and areas for development in both the curriculum and teaching and learning approaches, identify staff training requirements and will include both staff and pupil voice.

The work of the subject leader also involves supporting colleagues in the teaching of Design and Technology, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school.

Signed by:

Chair of Curriculum Committee:

Date:

Head teacher:

Date:

Agreed at the Curriculum Committee Meeting on:



Straits Primary School Design and Technology Programme of Study

Year Group Overview			
Year	Autumn Term	Spring Term	Summer Term
1	Structures <i>Free Standing Structures</i> Design, make and evaluate a playground structure.	Mechanisms <i>Sliders and Levers</i> Design, make and evaluate a moving greeting card.	Food <i>Preparing Fruit and Vegetables</i> Design, make and evaluate a smoothie for themselves.
2	Mechanisms <i>Wheels and Axles</i> Design, make and evaluate an emergency service toy vehicle	Textiles <i>Templates and Joining Techniques</i> Design, make and evaluate a medieval puppet for a puppet show performance.	Food <i>Preparing Fruit and Vegetables</i> Design, make and evaluate an African salad for a member of their family for lunch.
3	Food <i>Healthy and Varied Diet</i> Design, make and evaluate Christmas biscuits to sell.	Electrical Systems <i>Simple Circuits and Switches (Including programming and control)</i> Design, make and evaluate a torch for younger children.	Mechanical Systems <i>Pneumatics</i> Design, make and evaluate a moving monster using pneumatics.
4	Food <i>Healthy and Varied Diet</i> Design, make and evaluate a healthy pizza for themselves and their family for a celebration meal.	Textiles <i>2-D shape to 3-D Product</i> Design, make and evaluate a rainforest bag for an explorer.	Structures <i>Shell Structures (including computer-aided design)</i> Design, make and evaluate packaging for a product.
5	Mechanical Systems <i>Levers and Linkages</i>	Structures <i>Frame Structures</i>	Food <i>Healthy and Varied Diet</i>

	Design, make and evaluate a pop-up greeting card for a member of their family for a celebration.	Design, make and evaluate a prototype bridge (to scale) for pedestrians, cyclists and cars to cross over the river safely.	Design, make and evaluate a seasonal wrap for themselves for lunch on the go.
6	Textiles <i>Combining Different Fabric Shapes</i> Design, make and evaluate a mobile phone case.	Food <i>Healthy and Varied Diet</i> Design, make and evaluate a three-course meal.	Electrical Systems <i>More Complex Switches and Circuits</i> Design, make and evaluate a steady hand game. Computer Design Design, make and evaluate a race car.



EYFS Curriculum

Progression of Skills for Design and Technology

In Early Years Foundation Stage, Design and Technology is about exploring, observing, solving problems, thinking critically, making decisions and to talking about why they have made their decisions.

Reception	Physical Development	Develop their small motor skills so that they can use a range of tools competently, safely and confidently.
	Expressive Arts 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.
ELG	Physical Development	Use a range of small tools, including scissors.
	Expressive Arts 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.

Implementation: Progression of skills

		Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
To master practical skills	Food	• Cut, peel or grate ingredients safely and hygienically. • Measure or weigh using measuring cups or electronic scales. • Assemble or cook ingredients.	• Prepare ingredients hygienically using appropriate utensils. • Measure ingredients to the nearest gram accurately. • Follow a recipe. • Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking).	• Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). • Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. • Demonstrate a range of baking and cooking techniques. • Create and refine recipes, including ingredients, methods, cooking times and temperatures.
	Materials	• Cut materials safely using tools provided. • Measure and mark out to the nearest centimetre. • Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). • Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen).	• Cut materials accurately and safely by selecting appropriate tools. • Measure and mark out to the nearest millimetre. • Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). • Select appropriate joining techniques.	• Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).

To master practical Skills	Textiles	• Shape textiles using templates. • Join textiles using running stitch. • Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing).	• Understand the need for a seam allowance. • Join textiles with appropriate stitching. • Select the most appropriate techniques to decorate textiles.	• Create objects (such as a mobile phone holder) that employ a seam allowance. • Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration). • Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles.
	Electricals and electronics	• Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage).	• Create series and parallel circuits	• Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips).
	Computing		• Model designs using CAD software designed for this purpose.	• Write code to control and monitor models or products.
	Construction	• Practise techniques shown to construct or repair items such as gluing, stapling or the use of split pins.	• Choose suitable techniques to construct products or to repair items independently. • Strengthen materials using suitable techniques.	• Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).
	Mechanics	• Create products using levers, wheels and winding mechanisms.	• Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, gears winding mechanisms and pulleys.	• Convert rotary motion to linear using cams. • Use innovative combinations of electronics (or computing) and mechanics in product designs.

To design, make, evaluate and improve		• Design products that have a clear purpose and an intended user. • Understand the need to produce a draft version. • Make products, refining the design as work progresses. • Discuss how effectively the design has met the challenge criteria.	• Design with purpose by identifying opportunities to design. • Compare design ideas to real life products. • Make products by working efficiently (such as by carefully selecting materials). • Refine work and techniques as work progresses, continually evaluating the product design to help form a final product. • Use software to design and represent product designs.	• Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). • Understand the design criteria and build to a scale. • Make products through stages of prototypes, making continual refinements. • Ensure products have a high quality finish, using art skills where appropriate. • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs. • Reflect on how the final design meets the design criteria and can be incorporated into the real world.
To take inspiration from design throughout history		• Explore objects and designs to identify likes and dislikes of the designs. • Suggest improvements to existing designs. • Explore how products have been created.	• Identify some of the great designers in all of the areas of study to generate ideas for designs. • Improve upon existing designs, giving reasons for choices. • Disassemble products to understand how they work.	• Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. • Create innovative designs that improve upon existing products. • Evaluate the design of products so as to suggest improvements to the user experience.