Design and Technology

Curriculum Plan

SOUTHRIDGE FIRST SCHOOL - Design and Technology Long Term Plan
(Including Cookery and Nutrition)

Purpose of study

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and
technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Aims

The national curriculum for design and technology aims to ensure that all pupils:
. 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.

Subject content for Key Stage 1

Pupils should be taught:

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.

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 such as 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, such as levers, sliders, wheels and axles, in their products.

Subject content for 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.

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, such as 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, such as gears, pulleys, cams, levers and linkages
. understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs, buzzers and motors
. apply their understanding of computing to programme, monitor and control their products.

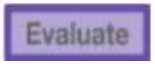
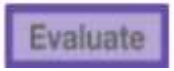
Attainment targets: By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.
COOKING & NUTRITION
Pupils should be taught to: **Key stage 1** **.** use basic principles of a healthy and varied diet to 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.
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.

Southridge First School Design and Technology Curriculum Overview

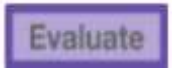
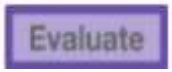
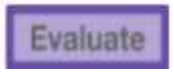
	Autumn 1 Mechanisms	Autumn 2	Spring 1 Structures	Spring 2 Cooking and Nutrition	Summer 1 Textiles	Summer 2 Electrical Systems
Y 1	Moving Storybook: Levers and Sliders Wheels and Axles		Windmills	Fruit and Vegetable Smoothie		
Y 2	Moving Monsters Ferris Wheels		Baby Bear's Chair	A Balanced Diet	Pouches	
Y 3	Pneumatic Toys		Castles	Eating Seasonally	Cushions	Static Electricity
Y 4	Slingshot Cars		Pavilions	Adapting a recipe	Fastenings	Torches

Four strands run through each topic:

Key stage 1 **National Curriculum D&T subject content**	D&T Strands	Topics	
Pupils should be taught to :		Year 1	Year 2
Design purposeful, functional, appealing products for themselves and other users based on design criteria	Design	Moving Story books Windmills Wheels and Axles	Moving Monsters Baby Bear's Chair Pouches Ferris Wheels
Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology	Design	Moving Story books Windmills Wheels and Axles	Moving Monsters Baby Bear's Chair Pouches Ferris Wheels
Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]	Make	Moving Story books Windmills Wheels and Axles	Moving Monsters Baby Bear's Chair Pouches Ferris Wheels
Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics	Make	Moving Story books	Moving Monsters

		Windmills Wheels and Axles Smoothies	Baby Bear's Chair Pouches Ferris Wheels A Balanced Diet
Explore and evaluate a range of existing products		Moving Story books Windmills Wheels and Axles Smoothies	Moving Monsters Pouches Ferris Wheels A Balanced Diet
Evaluate their ideas and products against design criteria		Moving Story books Windmills Wheels and Axles	Moving Monsters Baby Bear's Chair Pouches Ferris Wheels
Build structures, exploring how they can be made stronger, stiffer and more stable		Windmills	Baby Bear's Chair Ferris Wheels
Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.		Moving Story Books Wheels and Axles	Moving Monsters Ferris Wheels
Cooking and Nutrition: Use basic principles of a healthy and varied diet to prepare dishes		Fruit and Vegetable Smoothies	A Balanced Diet
Cooking and Nutrition: Understand where food comes from		Fruit and Vegetable Smoothies	A Balanced Diet

Key stage 2 **National Curriculum D&T subject content**	D&T Strands	Topics	
Pupils should be taught to:		Year 3	Year 4
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		Eating Seasonally Pneumatic Toys Castles Cushions Static Electricity	Slingshot Car Torches Pavilions Fastenings Adapting a Recipe
Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design		Pneumatic Toys Castles Cushions Static Electricity	Slingshot Car Torches Pavilions Fastenings
Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately		Pneumatic Toys Castles Cushions Static Electricity	Slingshot Car Torches Pavilions Fastenings
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		Eating Seasonally Pneumatic Toys	Slingshot Car Torches

		Castles Cushions Static Electricity	Pavilions Fastenings Adapting a Recipe
Investigate and analyse a range of existing products		Pneumatic Toys Castles Cushions Static Electricity	Slingshot Car Torches Pavilions Fastenings Adapting a Recipe
Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work		Pneumatic Toys Castles Cushions Static Electricity	Slingshot Car Torches Pavilions Fastenings Adapting a Recipe
Understand how key events and individuals in design and technology have helped shape the world		Pneumatic Toys	Slingshot Car Torches
Apply their understanding of how to strengthen, stiffen and reinforce more complex structures		Castles	Pavilions
Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]		Pneumatic Toys	Slingshot Cars

Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]	Technical Knowledge	Static Electricity	Torches
Apply their understanding of computing to program, monitor and control their products	Technical Knowledge	Pneumatic Toys	Torches
Cooking and Nutrition: Understand and apply principles of a healthy and varied diet	Technical Knowledge	Eating Seasonally	Adapting a Recipe
Cooking and Nutrition: Prepare and cook variety of predominantly savoury dishes using a range of cooking techniques	Make	Eating Seasonally	Adapting a Recipe
Cooking and Nutrition: Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed	Technical Knowledge	Eating Seasonally	Adapting a Recipe

Overview of topics by year

Year 1	**Food: Fruit and Vegetable Smoothie** (4 lessons) Children learn how to identify fruits and vegetables and then design and make a smoothie.	**Mechanisms: Moving Story Books** (4 Lessons) Children explore levers and sliders to make a moving story book.	**Structures: Windmills** (4 lessons) Through the theme of windmills, pupils design and create their own structure and functioning windmill.	**Mechanisms: Wheels and Axles** (4 lessons) Pupils experiment with mechanisms and troubleshoot why some wheels don't rotate, before designing and building a moving vehicle.
Curriculum coverage	**Design** Designing for others. **Make** Chopping fruit and vegetables. Making a smoothie. **Evaluate** Evaluating and adapting designs. **Technical knowledge** Describing and grouping fruits by texture and taste. Understanding the difference between fruit and vegetables.	**Design** Designing for others. **Make** Assembling accurately. Creating different movements (up, down, along and around). **Evaluate** Testing finished product. **Technical knowledge** Understanding what a mechanism is.	**Design** Designing for others. **Make** Assembling different components to work together to create motion. Assembling accurately. Cutting neatly. **Evaluate** Testing finished product. **Technical knowledge** Developing awareness of different structures for different purposes. Understanding how to turn 2D nets into 3D structures. Understanding what mechanisms are.	**Design** Designing Mechanisms. **Make** Adapting mechanisms. Measuring and cutting accurately. Following a design brief. Working to scale. Identifying materials commonly used for wheels. **Evaluate** Researching and testing mechanisms **Technical knowledge** Understanding how an axle works.

Overview of topics by year

Year 2	**Food: A Balanced Diet** (4 lessons) Pupils explore what makes a diet and taste test combinations of different food groups before designing and making a wrap.	**Mechanisms: Moving Monsters** (4 Lessons) Pupils analyse existing levers and linkage systems to identify components that they can use to plan, design and develop a mechanical monster.	**Structures: Baby Bear's Chair** (4 lessons) Pupils experiment with different shapes and manipulate materials to explore and evaluate a range of structural properties. They apply this knowledge to their own design, make and test task.	**Textiles: Pouches** (4 lessons) Children design and make their own wallet or purse, learning to use running stitch to join two pieces of fabric together.	**Mechanisms: Ferris Wheels** (4 lessons) Pupils explore existing mechanisms in order to design, test and make their own big wheel style ride.
Curriculum coverage	**Design** Designing packaging for their wrap. **Make** Preparing food safely and hygienically. Chopping safely using the bridge grip. **Evaluate** Conducting product research. Evaluating a design. **Technical knowledge** Understanding how fruit and vegetables grow. Knowing the food groups. Understanding what makes a balanced diet.	**Design** Creating and using design criteria, generating ideas. Planning for design and manufacturing. **Make** Cutting and assembling accurately. Selecting appropriate equipment and materials. **Evaluate** Carrying out primary research and applying to design. **Technical knowledge** Learning mechanical components. Identifying input and output.	**Design** Designing for others, using criteria and applying their knowledge of structures. **Make** Cutting and assembling accurately. **Evaluate** Examples of natural and manmade structures. Testing and evaluating. **Technical knowledge** Understanding the definition and importance of strength, stability and stiffness. Knowing that different shapes can strengthen or weaken structures that materials can be manipulated to improve strength and stiffness.	**Design** Considering purpose in the design process. **Make** Threading a needle. Sewing a running stitch. Preparing fabrics for sewing. **Evaluate** Discuss the making process and finished product. **Technical knowledge** Identify parts of a needle (point and eye). Understand the alternative ways of joining fabrics and embellishments.	**Design** Designing mechanisms. **Make** Measuring and cutting accurately, working to scale and following a design brief. **Evaluate** Testing and adapting mechanisms. Researching mechanisms. **Technical knowledge** Understanding how an axle works. Know materials commonly used for wheels.

Overview of topics by year

Year 3	**Food: Eating Seasonally** (4 lessons) Pupils learn about seasonality and about how the climate the food is grown in can alter the way it tastes. Make a crumble and tart using seasonal ingredients.	**Mechanisms: Pneumatic Toys** (4 Lessons) Pupils examine pneumatic systems using syringes and balloons then apply their understanding of mechanical systems to create their own pneumatic toys.	**Structures: Castles** (4 lessons) Pupils learn more advanced construction techniques and plan for complex arrangements of structures with continual emphasis on evaluating throughout.	**Textiles: Cushions** (4 lessons) Pupils learn to sew, cross stitch and applique and then apply this to the design and the creation of a cushion.	**Electrical Systems: Static Electricity** (4 lessons) Pupils are introduced to static electricity and observe the effects of it on different objects before designing and making a simple game which uses static electricity.
Curriculum coverage	**Design** Designing to a criteria. **Make** Safely preparing fruit and vegetables. Follow a recipe. **Evaluate** Tasting and evaluating their desert. **Technical knowledge** Knowing what foods are in season and when. Understanding the benefits of foods by their colour. Knowing how climate alters the sweetness of foods.	**Design** Generating and communicating ideas using sketching and modelling, using the views of others to improve their designs. **Make** Selecting appropriate materials and equipment for functional and aesthetic purposes. **Evaluate** Assessing how well their product works and if it matches their design. **Technical knowledge** Understanding how pneumatic systems work.	**Design** Planning for manufacture. Establishing and using a design criteria to help focus and evaluate their work. **Make** Using more demanding practical skills (paper engineering/paper folding techniques). **Evaluate** Evaluating as they work. Evaluating their own and other's final product. **Technical knowledge** Application of prior knowledge and increasing knowledge of nets.	**Design** Designing for a purpose. **Make** Sewing, cross stitch and using applique. **Evaluate** Compare to designs. **Technical knowledge** Construction of cushions. Understanding that fabrics can be layered for effect. Knowing different stitch types.	**Design** Using design criteria to develop ideas. **Make** Using electrostatic energy to move objects in isolation as well as part of a system. **Evaluate** Evaluate and adapt designs. **Technical knowledge** Understanding what static electricity means and how to generate it. Knowing what a target audience is.

Overview of topics by year

Year 4	**Food: Adapting a Recipe** (4 lessons) Pupils adapt a recipe by adding or altering the ingredients and then work in groups to create a final design that fall within a set budget and design brief.	**Structures: Pavilions** (4 Lessons) In an introduction to pavilion architecture pupils experiment with fame structures before designing their own landscape and pavilion, using a wider range of materials and construction techniques.	**Textiles: Fastenings** (4 lessons) Pupils research different types of fabric fastening before deciding which they want to use in their design for a book sleeve.	**Electrical Systems: Torches** (4 lessons) Pupils are introduced to electricity and electrical safety before making a simple electrical circuit to create a functioning torch.	**Mechanisms: Slingshot Cars** (4 lessons) Pupils use kinetic energy to power slingshot cars, designing and making their own and then testing their effectiveness in time trials.
Curriculum coverage	**Design** Working within a design brief. **Make** Following but adapting a recipe. Preparing food hygienically. **Evaluate** Discuss flavours identified. **Technical knowledge** Understanding the costs behind professional food preparation. Understanding the factors that contribute to the product design.	**Design** Exploring and designing within a given context/theme. **Make** Using a range of materials and equipment to create frame structures. **Evaluate** Discuss existing pavilions. **Technical knowledge** Knowing what a pavilion is. Building on prior knowledge of net structures and broadening knowledge of frame structures. Knowing that architects consider light, shadow and patterns when designing.	**Design** Designing for others and planning production. **Make** Selecting suitable tools. **Evaluate** Researching existing products. **Technical knowledge** Understanding stitches and their benefits. Knowing how to use templates.	**Design** Designing for others. **Make** Creating neatly presented work. Making an electrical circuit. **Evaluate** Evaluating to improve their work. Testing their final products. **Technical knowledge** Electricity is energy. Batteries are used to store electricity. Know terminology of: insulator, conductor, L.E.D., battery, coin cell batteries.	**Design** Developing designs using the views of others to improve them. Using nets and tabs to design and make the car body. **Make** Measuring, marking, cutting and assembling accurately. **Evaluate** Testing products in time trials. **Technical knowledge** Component names (chassis, axle etc.) Car body shape can impact speed (air resistance).