Somerleyton Design and Technology

Our design and technology curriculum aims to inspire pupil's creativity in the design and manufacture of purposeful and practical products. Pupils will undertake projects based on a clear sequence of designing, making and evaluating products that solve problems and appeal to specific users.

DT opportunities will be closely linked with other curriculum areas such as Science, Maths, PSHE, Computing and History, however subject content will be taught and assessed explicitly.

At Somerleyton Primary School we aim for all our children to be given the opportunity to:

- Develop creative ideas for innovative products
- Build on practical skills through the use of tools and equipment
- Understand how innovation and design is intrinsic to human development and history
- Extend key technical knowledge and vocabulary
- Confidently critique their own ideas, designs and products
- Learn from the ideas, designs and products of others
- Design and make 'something' for 'somebody' for 'some purpose'

"Design creates culture. Culture shapes values. Values determine the future." Robert L. Peters

Design and Technology Overview
Key Stage Two

The teaching and implementation of the Design and Technology Curriculum at Somerleyton School is focused on improving the children's knowledge, understanding and skills needs to engage in the process of design and making. The children will work across a range of contexts – for example our school allotment, learning garden and school community.

The children have blocks of timetabled lessons which over the course of the two year cycle include resistant materials, textiles and cooking. The lessons can be linked to history, geography or science or can be developed from another stimuli introduced by staff or children. The children will have the opportunity to use appropriate tools and equipment across the design and manufacturing process.

Projects will be planned on a two-yearly cycle for each class. Cooking and Nutrition will feature every year whilst the other disciplines will be planned once every two years.

Designers and craftspeople from a wider range of cultures, eras and life experiences will be explored as stimuli for our children's work.

Vocabulary marked with a star indicates this term has been introduced at a previous milestone and is included in order to recap prior learning.

DT Lower KS2			
Cycle One	Cooking and Nutrition	Mechanical Systems	Textiles
Cycle Two	Electrical Systems	Structures	Cooking and Nutrition
DT Upper KS2			
Cycle One	Structures	Mechanical Systems	Cooking and Nutrition
Cycle Two	Textiles	Electrical Systems	Cooking and Nutrition

DT Vocabulary Progression

Reception	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
	Cooking and Nutrition	Cooking and Nutrition	Cooking and Nutrition
	Slice Grate Chop Dough Nutrition Food group Yeast Hygiene	Dicing Kneading Savoury Diet (Balanced) Cuisine Grown Reared caught	Seasonality Carbohydrates Proteins Processed Ultra-processed Aroma Basic Tastes
	Structures	Structures	Structures
	Design Model Join Product Tool	Stiffen Strengthen Reinforce Stability Shell structure	Mitre joint Bench hook Bracket Chassis
	Mechanical Systems	Mechanical Systems	Mechanical Systems
	Pivot Shaping Joining Wheels Sliders Axle	Levers Linkages Pneumatics Control Process	Gears Cams Pulleys Monitor Follower Reciprocating Oscillating

DT Vocabulary Progression			
Reception	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
		Electrical Systems Circuit Switches Cell Switch Bulbs Conductor Insulator Appliance	Electrical Systems Resistor Battery Series circuits Buzzers Motors
	Textiles Running stitch Needle Thread Material Embellish Weave	Textiles Backstitch Blanket Stitch Hem Seem Warp Weft	Textiles Renewable Wadding Seam allowance
	Design and Evaluate Purposeful Functional Appealing Products Design Criteria Templates Mock-ups	Design and Evaluate Research Innovative Audience Cross-sectional diagrams Exploded diagrams Prototypes Analyse Aesthetic	

Cooking and Nutrition

Cooking and Nutrition	
Children utilise our school allotment and learning garden to provide the stimulus for recipes and cooking. Children connect the manufacturing of food with the science of fertilization, growth and nutrition. Children see cooking as a necessary life skill, and one in which they can be creative and develop a knowledge of the world.	
Key Skills	• Selecting ingredients linked to knowledge of nutrition and food science • Selecting and using the correct took to cut, grate or peel ingredients • Evaluating recipes and cooking using human senses including its aesthetic appeal
Possible outcomes	• Soups • Breads and other baked goods • Salads • Stews
Useful links	School education - British Nutrition Foundation Food Teaching in Primary Schools Healthier Families - Home - NHS (www.nhs.uk)
Significant people:	Delia Smith Jack Monroe Mrs Beaton

Key Vocabulary	
Dicing	To cut (food or other matter) into small cubes
Kneading	To manipulate dough by pushing it across a work surface and pulling it back. This is essential to develop the gluten.
Savoury	Belonging to the category that is salty or spicy rather than sweet.
Diet (Balanced)	The kinds of food that a person, animal, or community habitually eats. A balanced diet provides all the necessary nutrients in the correct amount/proportions to meet the body's needs.
Grown	Plants and crops germinating and developing
Reared	Breed and raise animals, often for food
Caught	Animals such as fish which are captured for human consumption
Cuisine	A traditional style of cooking and eating that has developed in a country or region of the world.

UKS2

Cooking and Nutrition

Cooking and Nutrition	
Children utilise our school allotment and learning garden to provide the stimulus for recipes and cooking. Children connect the manufacturing of food with the science of fertilization, growth and nutrition. Children explore how industrialisation has changed the way we prepare and consume our food, and how human tastes can be linked to advertising and behaviour.	
Key Skills	• Selecting ingredients linked to knowledge of nutrition and food science • Refining food preparation techniques to create products with distinctive textures, flavours and aromas. • Evaluating recipes and cooking using human senses including its aesthetic appeal
Possible outcomes	• Chutnies • Cheesecakes
Useful links	School education - British Nutrition Foundation Food Teaching in Primary Schools Healthier Families - Home - NHS (www.nhs.uk)
Significant people:	Dr Chris Van Tulleken

Key Vocabulary	
Seasonality	Foods being at the stage of their natural life cycle when they are ready for harvest or to be caught.
Carbohydrates	Macronutrients required by all animals; made in plants by the process of photosynthesis.
Proteins	A macronutrient that is essential to building muscle mass.
Processed	Food which has been changed from its natural state
Ultra-processed	Food which has been produced with significant additives, preservatives sweeteners and colourants.
Aroma	Distinctive often pleasant smell
Basic Tastes	The five human tastes of sweet, salty, sour, bitter and umami

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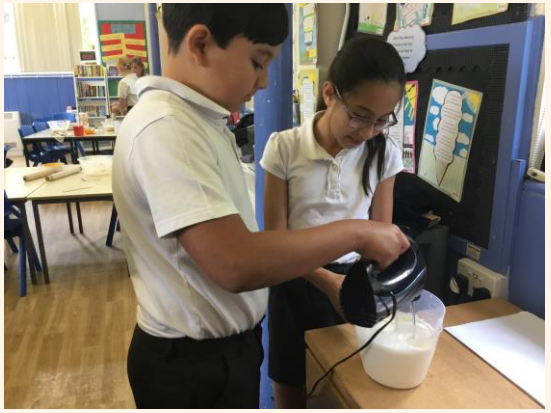
Examples of work

Year 3 & 4– Soup and flatbreads
Year 5 & 6 - Cheesecakes

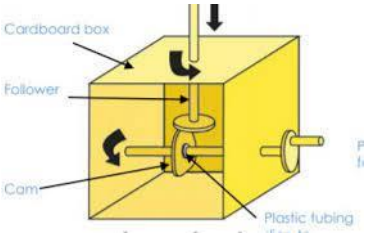


LKS2

Mechanical Systems

Mechanical Systems	
Children will learn how to design and use mechanical systems including levers, linkages, pulleys and cams Children then design, make and evaluate their own designs and made any modifications they feel are needed to make them suitable for the purpose and audience that they have been designed for. Ideas for systems will be purposeful utilising our school community and environment wherever possible.	
Key Skills	• Research appealing functional products • Use equipment to perform practical tasks • Use mechanical systems effectively • Apply understanding to strengthen complex structures • Understand and use mechanical systems in their products
Possible Outcomes	• Pneumatic toys • Vehicles • Cam toys
Useful links	KS2-Mechanical systems | STEM DIY - BBC Teach
Significant people	Archimedes Christopher Cockerell Charles Babbage Mary Anderson

Key Vocabulary	
Levers	Rigid bars resting on a pivot, used to move a heavy or firmly fixed load with one end when pressure is applied to the other
Linkage	A system of links
Control	How the mechanical system is operated
Process	A series of actions taken for a particular purpose
Pneumatics	Pneumatic conveying is the movement of solids through pipe using gas (usually air) as the motive force.



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UKS2

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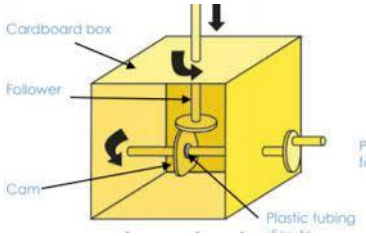
Key Vocabulary	
Cams	A projection on a rotating part in machinery, designed to make sliding contact with another part while rotating and impart motion to it
Oscillating	To move back and forth in a regular rhythm
Pulley	A wheel with a grooved rim around which a cord passes, which acts to change the direction of a force applied to the cord and is used to raise heavy weights
Reciprocating	Moving backward and forward in a straight line



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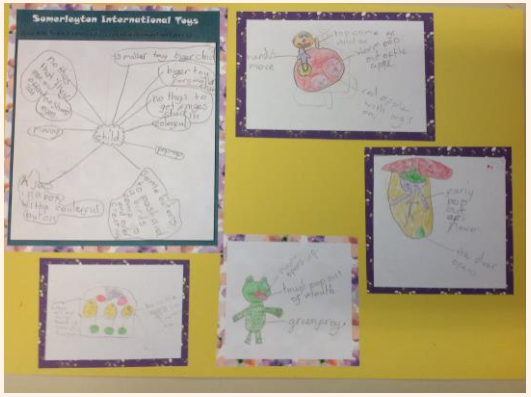
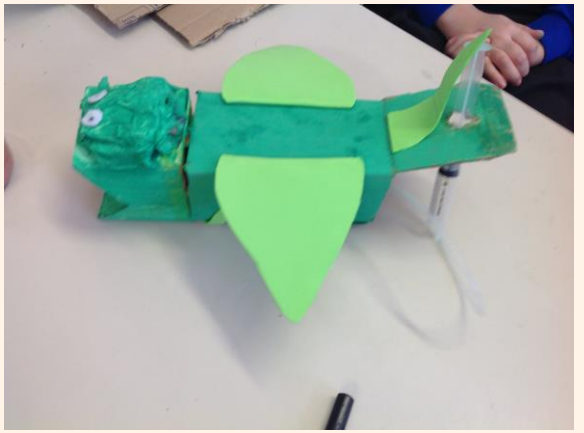
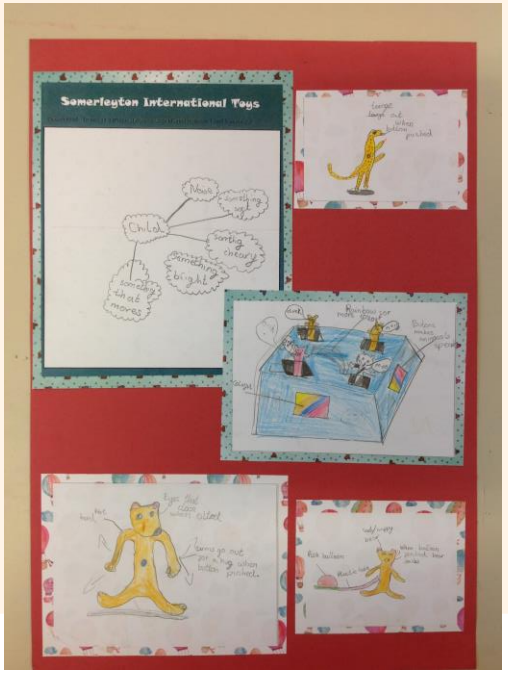
Examples of work

Key Stage 2 – Pneumatic toys





Design Process

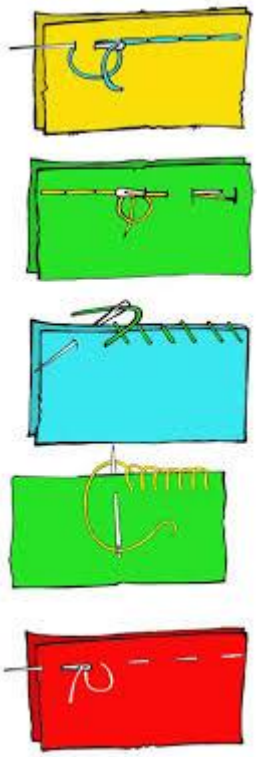


Final construction

LKS2

Textiles

Textiles	
Children have the opportunity to design, make, use and evaluate products made from textiles. They utilize a range of cutting and sewing techniques to make a purposeful product able to be used by themselves or another. They apply their skills from other curriculum areas to embellish their products with aesthetic design.	
Key Skills	• Research and develop design criteria to inform the design of appealing and functional products • Generate, develop, model and communicate their ideas through discussion, annotated sketches and pattern pieces. • Selecting from a wide range of tools and materials to fulfil their design brief • Exemplifying accurate joining and finishing of material to create aesthetic and useable products
Possible outcomes	• Shorts • Drawstring bags • Decorations • Puppets
Useful links	KS2-Textiles | STEM
Significant people	Coco Chanel Vivienne Westwood Faith Ringgold



Key Vocabulary	
Back stitch	a stitch sewn one stitch length backward on the front side and two stitch lengths forward on the reverse side to form a solid line of stitching on both sides
Blanket stitch	a buttonhole stitch used on the edges of a blanket or other material too thick to be hemmed
Hem	the edge of a piece of cloth or clothing which has been turned under and sewn
Seam	a line where two pieces of fabric are sewn together in a garment

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UKS2

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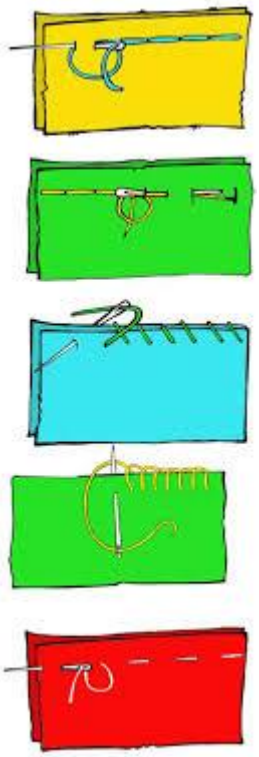

Key Vocabulary	
Renewable	A material which is not used up when used
Reinforce	strengthen or support especially with additional material
Wadding	Soft and thick material used to pack or line textiles
Seam allowance	The distance from the raw edge to the seem line

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Examples of work

Shorts– Year 3 and 4

Examples of work

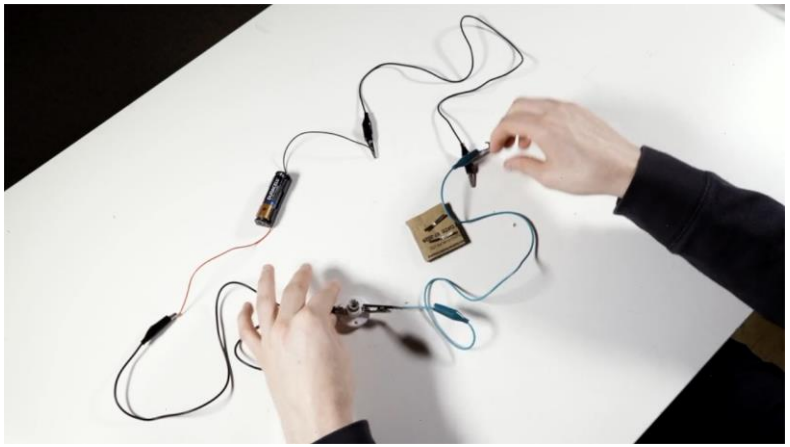
Seasonal decorations and drawstring bags – Year 5 and 6

LKS2

Electrical Systems

Electrical Systems	
Children will experience working with electrical systems including activities such as: designing a light for a particular purpose, making a doorbell and creating a hand-steady game for children to play. We will provide opportunities to explore different electrical systems looking the casings that circuits may sit in and the purpose of the circuit in the product design. Work will expand the children's knowledge of electricity gleaned from their Science learning.	
Key Skills:	• Generate prototypes and exploded diagrams of circuits • Select from a wide range of components to complete an effective circuit • Understand and use electrical systems in their products • Apply their understanding of computing to program, monitor and control their products
Possible outcomes:	• Board games • Cards • Burglar alarms • Toys
Useful links:	KS2: Electrical systems | STEM IET - Institution of Engineering and Technology (theiet.org) Electronics and electricals - KS2 Design and Technology - BBC Bitesize
Significant people	Nikola Tesla Thomas Edison Ada Lovelace

Key Vocabulary	
Appliance	A piece of equipment designed to perform a specific task
Circuit	Electrical circuit is an interconnection of electrical components
Switches	a device for making and breaking the connection in an electric circuit
Conductors	Materials that conducts heat or electricity
Insulator	A material which does not conduct heat or electricity
Bulb	A transparent hollow glass container which contains a light producing mechanism



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UKS2

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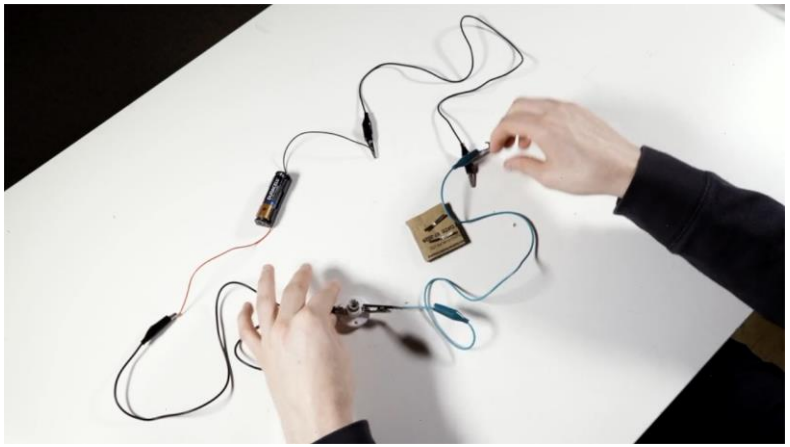
Key Vocabulary	
Battery	a container consisting of one or more cells
Circuit ★	Electrical circuit is an interconnection of electrical components
Switches ★	a device for making and breaking the connection in an electric circuit
Components	a part or element of a larger machine or circuit
Resistor	a device having resistance to the passage of an electric current



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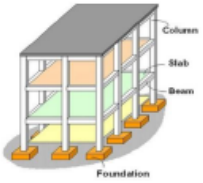
Examples of work

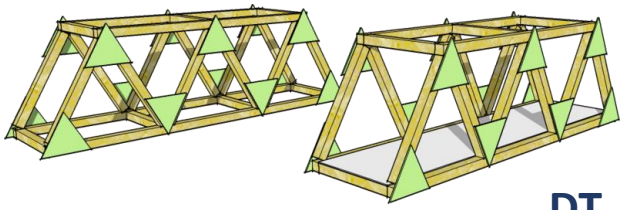
Year 5 and 6– Electrical vehicles

LKS2 Structures

Structures	
Children will experience challenges including packaging, sculptures, buildings, bridges and planes. Children will have the opportunity to explore different structures looking at the materials they are made from, how they are joined together and how strong they are. There are a range of authentic contexts for children to design, make and evaluate their own designs and made any modifications they feel are needed to make them suitable for the purpose and audience that they have been designed for.	
Key Skills:	• generate, develop, model and communicate their ideas through discussion, cross-sectional and exploded diagrams. • Apply their understanding of how to strengthen, stiffen and reinforce more complex structures • Understand how key events and individuals in design and technology have helped shape the world
Possible outcomes:	• Musical instruments • Bridges • Shell structures
Useful links:	KS2-Structures | STEM Bridges.pdf (nicurriculum.org.uk) Music / Science KS2: How string instruments make sound - BBC Teach
Significant people	Isambard Kingdom Brunel Fazlur Rahman Khan Gustav Eiffel Antonio de Torres Jurado



Key Vocabulary	
Stiffen	Make or become rigid
Strengthen	Make of become stronger
Re-inforce	strengthen or support especially with additional material
Stability	The state of being stable
Shell structure	Shell Structures are defined as structures that are capable of maintaining their shape and the support loads without any help of the frame or the solid mass materials



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UKS2 Structures

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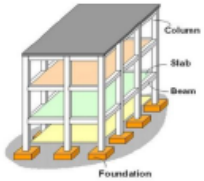
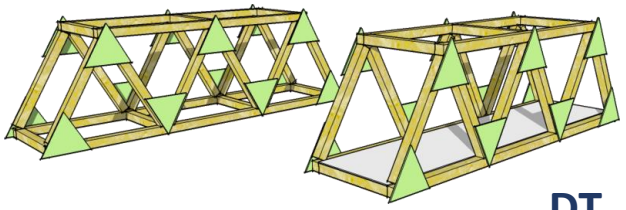


Key Vocabulary	
Mitre joint	A joint made by cutting two pieces of wood to secure at 45 degrees to form a corner.
Bench hook	A tool which holds a piece of wood in place whilst safely cutting
Bracket	A piece of wood, metal or plastic – usually L-shaped – used to secure something to a flat surface
Chassis	The outer frame of a vehicle



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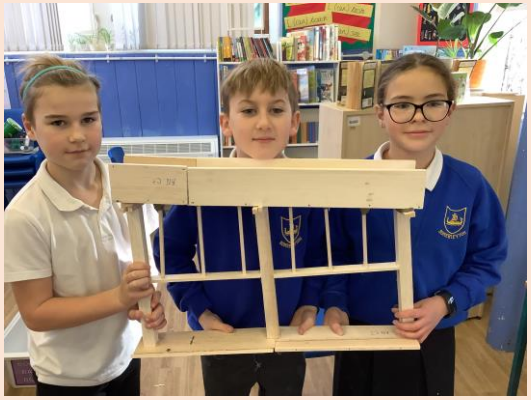
Examples of work

Box-frame guitars– Year 3 and 4
Roman Aqueducts – Year 5 and 6

Construction