

Programme of Study for Design and Technology

We base our programme of study on the National Curriculum and use the Design and Technology Association D&T Primary planning and guidance sheets to assist with subject knowledge and planning.

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

By the end of Key Stage 2, pupils are expected to know, apply and understand the knowledge, skills and processes specified in the programmes of study and the skills progression matrix below.

Curriculum Map for Design and Technology

	Year 1	Year 2	Year 3	Year 4	Upper Key Stage 2
Mechanisms	Wheels and axles (Saving lives)	Sliders and levers (Move It)	Making a moving picture- levers and linkages		Electric cars- mechanisms and pulleys
Structures		Freestanding structures (Fire Fire!)		Packaging design- shell structures	Bridges- frame structures
Electrical systems	Torches (Light)			Simple programming and control- Easy Buggy	Monitoring and control- Programmable Robots
Cooking and nutrition	Vegetable soup (This is me)		Salads from around the world-food and healthy diets		Making bread
Textiles	Templates and joining techniques (What is the weather?)			Making a stuffed toy- 2D shape to 3D product	Bags- Combining different fabric shapes

See Science Programme of Study for units on electricity and the Computing Programme of Study for further electrical control and programming.

Design and technology in Year 7

Cromer Academy: Graphics, Branding and Printing Techniques: Typography and Logo design, Record/CD sleeve and printing, T-shirt design and Screen Printing

Aylsham High School: The Key Stage 3 course gives students the opportunity to develop their ability to design and make a range of quality products both individually and as part of a team. Students will be using machines (including CAD/CAM), computers, hand tools and prototyping kits, involving them in a wide range of design and making activities. They will experience working with timber, metal, smart materials, composites, card, plastics and fabrics to produce three-dimensional outcomes. Their work will be assessed according to national curriculum design and technology outcomes.

Sheringham High School:

In Year 7, students undertake three projects which teach them a broad range of designing and making skills. The basis is to have a good grounding in Health and Safety in dangerous environments and to have a broad range of tools at their disposal to be able to become effective designer makers.

STEADY HAND GAME - This project speaks for itself. Students will be learning about Health and Safety in the workshop, working with multi materials such as metals and plastics, and also basic electronics and CNC machining. Students will also be going through the design process, including modelling and testing.

FOOD - During this project students will focus on Five – a - Day. Students will develop practical skills using a variety of tools and equipment, learn the importance of hygiene and safety when working in the food area, learn how to carry out and record sensory testing and develop an understanding of healthy eating and current dietary advice.

MIX IT UP - The main aim of this project is for students to learn how to use CAD / CAM and lasercutter technologies to create a Drawing Buddy. They also focus on designing skills, formal drawing techniques and a range of modelling processes that can be used to communicate ideas. Students also work on developing their skills in mechanisms and mechanical systems using our interactive Focus E-Learning software.

Progression in Design and Technology knowledge, skills and understanding

Aspect of learning	EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Understanding of design and designers		Explore and evaluate a range of existing products and how they work.	Understand how key events and individuals in design and technology have helped shape the world. Investigate and analyse a range of existing products.	Understand how key events and individuals in design and technology have helped shape the world. Investigate and analyse a range of existing products.
Technical knowledge and understanding	Safely use and explore a variety of materials, tools and techniques.	Begin to understand how structures can be made stronger, stiffer and more stable Begin to use simple mechanisms [for example, levers, sliders, wheels and axles], in their products. Begin to understand simple textile design, including the importance of patterns. Use the basic principles of a healthy and varied diet to prepare dishes Understand where food comes from. Understand the importance of hygiene when preparing food	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] Understand and use patterns in textile design. 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. Understand the importance of hygiene when preparing food	
Designing	Listen attentively and respond to what they hear with relevant questions, comments	Design purposeful, functional, appealing products for	Generate and clarify realistic ideas to make an appealing, functional product fit for purpose and specific users.	Use research and develop design criteria to inform the design of innovative, functional, appealing

	and actions during whole class discussions and small group interactions.	themselves and other users based on design criteria. Develop, model and communicate ideas through talking, drawing and mock-ups.	Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes and pattern pieces.	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.
Making	Safely use and explore a variety of materials, tools and techniques. Use a range of small tools, including scissors, paint brushes and cutlery.	Select from and use a range of tools and equipment to perform practical tasks such as chopping, slicing and mixing; marking out, cutting and joining, finishing. Select from and use a range of materials and components such as cooking ingredients, textiles, paper, card, plastic and wood; reclaimed materials and construction kits, according to their characteristics.	Select and use a range of appropriate tools with increasing accuracy eg to chop, slice and mix in cooking; mark out and measure, cut, score, join, shape and assemble. Select and use a range of materials and components according to their functional characteristics eg fabrics and fastenings; different ingredients; different papers, cards and plastics; electrical, pulleys, gearing and pneumatic components. Use appropriate finishing techniques suitable for the product being made.	Competently select from a range of tools and equipment to make products that are accurately measured, cut and joined, shaped, assembled and well finished. 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. Work within the constraints of time, resources and cost.
Evaluating	Share their creations, explaining the process they have used.	Evaluate own product by discussing how well it works in relation to the purpose and the user and whether it meets its design criteria.	Test products according to the design brief and record results in a variety of ways eg tables and graphs. Evaluate the final product with reference to the design criteria and quality of make.	Test products and record results in a variety of ways, including using a spreadsheet. Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.

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:

1. Design

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

2. Make

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

3. Evaluate

- a. explore and evaluate a range of existing products
- b. evaluate their ideas and products against design criteria Technical knowledge
- c. build structures, exploring how they can be made stronger, stiffer and more stable
- d. explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Design- make- evaluate forms the basic teaching sequence for most design and technology projects. In Key Stage 1, design and technology is taught as part of each cross-curricular theme, which is detailed in the **Key Stage 1 Curriculum Overview**. The design and technology elements of these units are set out below.

Year 1

Year 1 Autumn Term

From the Y1 theme: This is me.

In this theme, the children learn about healthy food, make careful observational sketches of different fruit and vegetables and use the knowledge to design and make their own fruit salad. They find out about where the ingredients for their dishes come from using maps of the world, Europe and the United Kingdom and design and make their own vegetable soup, which they sell at our school Harvest Festival.

Subject knowledge, skills and concepts	Prior and future learning
(see DT Association planning 'Food') Knowledge and understanding: <ul style="list-style-type: none">• Use the basic principles of a healthy and varied diet to prepare dishes• Understand where food comes from.• Understand the importance of hygiene when preparing food Skills: <ul style="list-style-type: none">• Select from and use a range of tools and equipment to perform practical tasks such as chopping, slicing and mixing.• Select from and use a range of materials and components such as cooking ingredients, according to their characteristics. Vocabulary to teach: vegetable, carrot, potato, cauliflower, parsnip, courgette, pea, bean, soup, chop, slice, mix, stir, recipe, healthy diet	EYFS: Vegetable soup. Learning about food and food preparation in this unit leads on to the Year 3 unit 'Salads from around the world' and then the Y5 and 6 unit on 'Bread'.

Year 1 Summer Term

From the Y1 theme: What is the weather?

In design and technology, the children will use simple patterns and joining techniques to make holiday outfits for their teddy bears that they can wear in different British weather.

Subject knowledge, skills and concepts	Prior and future learning
(see DT Association Plans 'Textiles')	EYFS: Moving parts.

<p>Knowledge and understanding:</p> <ul style="list-style-type: none"> • Explore and evaluate a range of existing products and how they work eg clothing • Begin to understand simple textile design, including the importance of patterns. <p>Skills and concepts:</p> <ul style="list-style-type: none"> • Design purposeful, functional, appealing products for themselves and other users based on design criteria. • Develop, model and communicate ideas through talking, drawing and mock-ups. • Select from and use a range of tools and equipment to perform practical tasks such as ... marking out, cutting and joining, finishing. • Select from and use a range of materials and components such as ... textiles ..., according to their characteristics. • Evaluate own product by discussing how well it works in relation to the purpose and the user and whether it meets its design criteria. <p>Vocabulary to teach: Textile, material, pattern, template, scissors, needle, thread, cut, sew</p>	<p>This unit leads to DT units in Y4 and 5/6 on 'Making a stuffed toy' and 'Bags'. It is also built on in the Art and Design Y4 unit 'Drawing with scissors'.</p>
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Year 1 Summer Term

From the Y1 theme: Saving Lives

Following a visit to the lifeboat station at Cromer, the children investigate floating and sinking and then apply this knowledge to a design and technology project to make their own floating lifeboat and learn how wheels and axles work to make tractors and trailers to pull them.

Subject knowledge, skills and concepts	Prior and future learning
<p>(See DT Association plans 'Wheels and Axles')</p> <p>Knowledge and understanding:</p> <ul style="list-style-type: none"> • Explore and evaluate a range of existing products and how they work. • Begin to use simple mechanisms [for example, wheels and axles], in their products. <p>Skills and concepts:</p>	<p>EYFS: Moving parts</p> <p>Previous Y1 work on designing and making in What is the Weather?</p>

<ul style="list-style-type: none"> • Design purposeful, functional, appealing products for themselves and other users based on design criteria. • Develop, model and communicate ideas through talking, drawing and mock-ups. • Select from and use a range of tools and equipment to perform practical tasks such as out, cutting and joining, finishing. • Select from and use a range of materials and components such as paper, card, plastic and wood; reclaimed materials and construction kits, according to their characteristics. • Evaluate own product by discussing how well it works in relation to the purpose and the user and whether it meets its design criteria. <p>Vocabulary to teach: Design, make, test, evaluate, cut, join, waterproof, axle, wheel, chassis, hull.</p>	<p>Children's learning about understanding mechanisms in this unit leads to learning about sliders and levers in the Y2 unit 'Move it!' and ultimately in the Y4 unit 'Easy Buggy' and the Y5 and 6 unit on 'Electric Cars'.</p>
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Year 2

Year 2 Autumn Term

From the Y2 theme: Fire, Fire!

Tin the context of their learning about the Great Fire of London, the children learn about the properties of the different materials that were used in the seventeenth century to build houses. They then use the knowledge they have gained to build their own model of London, which they spectacularly set alight in the school woods.

Subject knowledge, skills and concepts	Prior and future learning
<p>(see DT Association Plans 'Textiles')</p> <p>Knowledge and understanding:</p> <ul style="list-style-type: none"> • Explore and evaluate a range of existing products and how they work eg clothing • Begin to understand simple textile design, including the importance of patterns. <p>Skills and concepts:</p> <ul style="list-style-type: none"> • Design purposeful, functional, appealing products for themselves and other users based on design criteria. 	<p>EYFS: Moving parts.</p> <p>This unit leads to DT units in Y4 and 5/6 on 'Making a stuffed toy' and 'Bags'. It is also built on in the Art and Design Y4 unit 'Drawing with scissors'.</p>

<ul style="list-style-type: none"> • Develop, model and communicate ideas through talking, drawing and mock-ups. • Select from and use a range of tools and equipment to perform practical tasks such as ... marking out, cutting and joining, finishing. • Select from and use a range of materials and components such as ... textiles ..., according to their characteristics. • Evaluate own product by discussing how well it works in relation to the purpose and the user and whether it meets its design criteria. <p>Vocabulary to teach: Textile, material, pattern, template, scissors, needle, thread, cut, sew</p>	
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Year 2 Spring Term

From the Y2 theme: Move it!

This theme uses the book 'Famous Explorers - Interactive History Book for Kids (Lift-the-flap History)' by [Joshua George](#) and [Ed Myer](#) as a stimulus for learning about significant historical figures and the technology of sliders and levers and culminates in the children making their own 'moving' pictures based on what they have learnt in history.

Subject knowledge, skills and concepts	Prior and future learning
<p>Design and Technology</p> <p>Knowledge and understanding (see DT Association plans 'Levers and Sliders')</p> <ul style="list-style-type: none"> • Begin to use simple mechanisms [for example, levers, sliders], in their products. <p>Skills and concepts:</p> <ul style="list-style-type: none"> • Explore and evaluate a range of existing products and how they work. • Design purposeful, functional, appealing products for themselves and other users based on design criteria. • Develop, model and communicate ideas through talking, drawing and mock-ups. • Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting and joining, finishing. 	<p>Previous work on mechanisms was in the Y1 unit 'Saving Lives' on wheels and axles. In the Y2 unit 'Fire, Fire', the children were introduced to the design process.</p> <p>This leads directly on to the Year 3 unit, 'Making a moving picture'.</p>

<ul style="list-style-type: none"> • Select from and use a range of materials and components, such as textiles, paper, card, according to their characteristics. • Evaluate own product by discussing how well it works in relation to the purpose and the user and whether it meets its design criteria. <p>Vocabulary to teach: Mechanism, moving part, slider, lever, material, component, design, evaluate.</p>	
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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].

In Key Stage 2, design and technology is taught through a series of study units that focus on a specific aspect of the subject, but which build children's skills progressively. In addition, we have an annual 'project-in-a-day', in which children are able to apply the skills they have learned in a new problem-solving context.

When designing and making, pupils should be taught to:

1. Design

- a. 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
- b. generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

2. Make

- a. select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- b. 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

3. Evaluate

- a. investigate and analyse a range of existing products
- b. evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- c. understand how key events and individuals in design and technology have helped shape the world

4. Technical knowledge

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

Lower Key Stage 2 Study Units

Year 3

Year 3 Autumn Term

Salads- food and healthy diets
<p>Summary of learning</p> <p>This study unit builds on the Year 1 unit ‘Preparing fruit and vegetables’ and leads on to the Upper Key Stage 2 unit ‘Bread’.</p> <p>The children investigate a range of different salad vegetables, carry out sensory evaluations of the foods and gather information about them, including where they were grown and whether they need to be cooked or eaten raw. They consider the role of salad in a healthy diet, including as part of a vegetarian or vegan diet. The children investigate how cooks and chefs, such as Delia Smith and Jamie Oliver combine salad vegetables with other ingredients to make different salad dishes and dressings.</p> <p>As a focused practical task, the children prepare a simple rice or potato salad hygienically from a Delia Smith or Jamie Oliver recipe, developing their cutting and peeling techniques and learning to cook potato or rice on a hob. They learn to combine the ingredients according to the recipe and then evaluate their finished product.</p>

Using a website, such as BBC Good Food, the children will research and collect different salad recipes from around the world, then use one of these dishes as the basis for their own salad dish for an end of unit Festival of Salad. They will communicate their design through discussion, sketches, a costed list of ingredients and a breakdown of their order of preparation. The children will then prepare their final products to share at the Festival, taking care to observe good food hygiene.

Following the Festival, the children will consider what others think of the product and consider how it may be improved. Finally, they will make their own recipe card with ingredients and a stepped method.

Vocabulary to be used and understood:

Salad, a range of ingredients associated with the recipes they research, recipe, ingredients, method, vegetarian, vegan, utensils, texture, taste, appearance, preference, hygiene, healthy and varied diet.

Year 3 Spring Term

Levers and linkages: Making a moving picture

Summary of learning:

This study unit builds on the Year 2 unit 'Sliders and levers' and leads on to the Upper Key Stage 2 unit 'Electric Cars'.

To introduce this unit, the children learn about how levers and linkages are used in a range of different machines, such as the types of machines found on building sites. They also learn how levers and linkages were developed in the past by inventors such as Robert Stephenson and James Watt in their famous steam engines, including Stephenson's Rocket.

In the context of 'Stone Age Boy', the picture book by Satoshi Kitamura and other similar pop-up style books, the children will investigate, analyse and evaluate a range of lever and linkage mechanisms. Applying what they have learnt, they will make examples of these mechanisms through focused tasks.

The children will then design their own 'Stone Age Boy' page for a class interactive display. They will consider the purpose of the product and who is it for. They will generate a range of ideas and agree on the design criteria that is to be developed.

Throughout the process, the children will use annotated sketches and prototypes in order to develop and model their ideas. They will consider the main stages in making before assembling, drawing on their knowledge from their investigation and focused tasks. They will use a range of tools in order to measure, cut and join their materials and, having displayed their pop-up pages, will evaluate their final product against the intended purpose and their intended user.

Vocabulary to be used and understood:

mechanism, lever, linkage, pivot, slot, bridge, guide, process, prototype, design criteria

Links

This study unit links with Year 2 'Sliders and Levers' and Years 5 and 6 'Mechanisms and Pulleys'.

Year 4

Year 4 Autumn Term

Packaging Design: Shell Structures

Summary of learning

This study unit links with Year 1 and 2 Free standing structures and the Upper Key Stage 2 unit on Bridges. It is also taught in conjunction with the writing unit on Persuasive Writing (advertising).

To introduce this study unit, the children look at mobile phone packaging, such as for successive iPhones and how companies see packaging as an important part of developing and selling their brand. The children explore other packaging, such as for Easter eggs looking at the materials they are made from and for design details that form a function, such as to protect the product or market the product.

The children disassemble a collection of packaging based on a shell structures to identify their net and other features, such as tabs. They evaluate these existing products to determine which design they think are the most effective in a variety of ways, such as protection for the product, style of design and shelf appeal.

In two focused practical tasks, the children:

- are introduced to simple drawing software. They explore the interface and drawing tools to practice drawing and manipulating shapes and draw nets of their own using gridlines and pre-shaped tools.
- practise and explore making nets out of card and joining flat faces to create 3D shapes. They experiment with assembling pre-drawn ends in numerous ways using, scoring, cutting and assembling techniques to produce a well finished solid shape.

Linked to the writing unit that the children have been doing to advertise a product, the children develop a design brief for the product's packaging. They discuss the uses and purposes of their shell structure, consider measurements and make sketches of different options, before carrying out some market research with their classmates and finally deciding on their final packaging idea. They then use computer aided design software to print out their nets to develop prototypes to evaluate and refine their ideas.

The children then make and finish their product using tools and joining techniques practiced in the focused practical task. They present their final product at a class design fair at which they collect feedback and evaluate the success of their packaging.

Vocabulary to be used and understood: packaging, shell structure, three-dimensional, shape, net, assemble, recycle, corrugating, graphics, design, prototype, computer aided design

Year 4 Spring Term

Making a textile toy: 2D shapes to 3D products

Summary of learning

This study unit links with Year 1 'Textiles, templates and joining techniques' and Upper Key Stage 2 'Bags'.

In this study unit, the children find out about the history of soft toys, including how 'teddy bears' have developed over time into the products they are today. Specifically they find out about Richard Steiff and the Steiff brand. The children investigate a range of textile toys that have a selection of stitches, joins, fabrics, finishing techniques, fastenings and purposes. As part of this

investigation, the children disassemble products and look at different patterns for soft toys to gain an understanding of 3D shape, patterns and seam allowances.

In their focused practical task, the children practice a range of sewing techniques to sew two small pieces of material together. They also explore a range of fabrics, such as cotton, polyester and felt and consider which are suitable for their task.

Then, the children create a design brief to make a textile toy for a younger child. They research the intended use and the requirements of their 'customer' in order to inform the brief. The children then think about the stages of making their product and make sketches and a paper prototype. They then go on to make a pattern and a flow diagram to show their order of make.

The children assemble their product using the skills they have practiced, modifying their design as necessary as they go. Finally, they present the toy to their 'customer' and evaluate the appeal and success of their final product.

Vocabulary to be used and understood: fabric, cotton, polyester, felt, fastening, pattern, templates, seam, seam allowance, prototype.

Year 4 Summer Term

Simple programming and control- Easy Buggy

Summary of learning

This Design and Technology unit combines what the children have learnt in computing about sequencing and repetition to design and make a programmable and steerable buggy that will overcome a series of physical challenges. It is based on the Code It Primary Programming 'Affordable STEM computing projects for the Primary Classroom' Easy Buggy Challenge.

Vocabulary to be used and understood: See above.

Links: Learning is based on the Years 3 and 4 Computing units on sequencing and repetition; the learning in this unit is built on in the Year 5 and 6 DT unit 'Programmable Robots'.

Upper Key Stage 2

Upper Key Stage 2 Autumn Term 2021

Structures: Frame Structures
<p>Summary of learning</p> <p>This study unit links with Lower Key Stage 2 unit on ‘Shell Structures’ and Upper Key Stage 2 science unit on ‘Forces’. It is also an opportunity to broaden children’s geographical knowledge through the bridges taught.</p> <p>In this unit, the children will find out about frame structures and what makes them rigid in the context of a study of different types of bridges. They will find out about beam, truss, arch and suspension bridges and compare and contrast the key features of each and how they work. In particular the children will find out about the Roman Pont Du Gard, Thomas Farnolls Pritchard’s Iron Bridge and the Akashi Kaikyo suspension bridge in Japan. As a focused practical task, they will make a simple beam bridge from card and square section wood to cross a 50cm river, which they will test by adding weight to the centre of the bridge and then analyse the reasons for the bridge to fail.</p> <p>The children will then be presented with the challenge of constructing a bridge to span a valley. The bridge can be of any of the designs studied, but must be freestanding and not include piers or supports to the valley floor. As part of the design brief, the children must produce annotated sketches, exploded views and cross-sectional plans, as well as a step-by-step construction plan. Once completed, the bridge will be subject to a series of tests to check its strengths and aesthetics.</p> <p>They will use a range of tools in order to measure, cut and join their materials and finish their final products to a high standard, before testing and evaluating their final product against the intended purpose.</p> <p>Vocabulary to be used and understood:</p> <p>Truss, beam, suspension, arch, span, pier.</p>

Upper Key Stage 2 Spring Term 2022

Textiles: Combining different fabric shapes

Summary of learning

This study unit links with Lower Key Stage 2 unit on '2D shape to 3D product'.

In this unit, the children will learn how they can combine different fabric shapes to construct simple bags for specific purposes by using a pattern. They investigate a variety of bags used for different purposes eg for personal effects, shopping, bookbags, PE bags. They disassemble bags in order to work out the shapes that are used to make them and to work out the pattern that might have been used to construct them. The children look at handbag designers, such as Dior and Chanel, investigating how the bags are made and designed.

Through a focused practical task, the children practice cutting out from a pattern and simple stitching through making a felt purse or similar with a simple fastener. They may add detail through the addition of applique or simple embroidery.

The children are then presented with the challenge of designing and making a bag for a fashion show. The bag must have a defined purpose and be finished well with a fastening and other detail. In order to make the bag, the children must create a simple pattern and step-by-step instructions. They will need to cut out the pattern and stitch it together, although an adult on a sewing machine could be employed in order to finish them off. They can use applique or embroidery to finish.

The final fashion show might form a parents' assembly and incorporate other elements. It can also be used to gain feedback about the finished designs and assist with evaluation.

Vocabulary to be used and understood:

Applique, embroidery, pattern, seam, seam allowance, fastening, textile, tacking

Upper Key Stage 2 Summer Term 2022**Monitoring and Control: Programmable Robots****Summary of learning**

This Design and Technology unit combines what the children have learnt in computing about variables, selection and sensing to design and make a programmable and steerable buggy that uses a front mounted sensor to overcome a series of physical

challenges to perform a function. It is based on the Code It Primary Programming 'Affordable STEM computing projects for the Primary Classroom' Robot Challenge.

As technical knowledge and understanding to introduce the unit, the children learn about how robots and machines such as robotic vacuum cleaners, cars and smart traffic lights are equipped with sensor detection.

Vocabulary to be used and understood: See Code It resource above.

Links: Learning is based on the Years 5 and 6 Computing units on selection, variables and selection and the Year 4 DT unit Easy Buggy.

Upper Key Stage 2 Autumn Term 2022

Food: Making bread

Summary of learning

This study unit builds on the Year 3 unit 'Salads' and leads on to the Year 7 unit 'Food' at Sheringham High School.

This unit of work is all about bread. The children learn about different types of bread from around the world and how bread is the staple of many diets. They sample different breads and find out about the importance of yeast in many bread recipes. They bake their own bread using a basic recipe. They design their own variation of a type of bread, producing a recipe card with ingredients and method and bake it for a class autumn feast. They construct and conduct a taste test of the final outcome to assist them with their evaluation.

Vocabulary to be used and understood:

Leavened, unleavened, yeast, culture, kneed, prove, ingredients, method, naan, pitta, flatbread, tortilla.

Upper Key Stage 2 Spring Term 2023

Mechanisms- Pulleys: Electric cars

Summary of learning

This study unit links with Year 2 'Sliders and Levers', Year 3 'Mechanisms: levers and linkages' and the Year 4 unit 'Easy Buggy'. It also links directly with the Year 5 and 6 science unit on 'Electricity' and the environmental geography unit on 'Renewable Energy'.

In this unit, the children will find out about electric cars and how they work. They will study, in particular, the NASA lunar rover and cars produced by the Californian based Tesla company. The children will investigate, analyse and evaluate a simple model electric car chassis with a pulley and driveshaft mechanism (See DT association planning sheets). They will alter wheel and pulley size and note the effect this has on performance. Applying what they have learnt, they will make examples of these mechanisms through focused tasks.

The outcome of this unit is for the children to make their own electric cars that are designed to meet a series of tests eg speed, performance from a hill start and aesthetics. They will work in small teams and generate a range of ideas and agree on the design criteria that is to be developed.

Throughout the process, the children will use annotated sketches, exploded diagrams and cross-sectional drawings in order to develop and model their ideas. They will consider the main stages in making before assembling, drawing on their knowledge from their investigation and focused tasks to produce a step-by-step guide to making. They will use a range of tools in order to measure, cut and join their materials and finish their final products to a high standard, before testing and evaluating their final product against the intended purpose.

In their evaluation, the children will consider the advantages and disadvantages of modern electric car development in terms of the environment and battery range.

Vocabulary to be used and understood:

mechanism, axle, pulley, gear, driveshaft, chassis, prototype, design criteria