Design Technology

VISION

Design and Technology is an inspiring, rigorous and practical subject. We value the creative curriculum and believe that it can have a powerful and positive effect on children, helping them to become confident, creative learners who are able to express their individual interests, thoughts and ideas.

We encourage the children to use their creativity and imagination to design and make products that solve real and relevant problems within a variety of contexts considering their own and others' needs, wants and values. We aim to make links to designs and designers throughout history, providing opportunities for children to critically reflect upon and evaluate others designs and the overall effectiveness of the product before evaluating their own. As pupils progress, we support them to be able to think critically and develop a more rigorous understanding of design and technology.

Through DT work in the classroom, the children have the opportunity to develop their skills in mechanisms, structures, textiles, mechanical systems, electrical systems and cooking and nutrition. These areas are developed continuously throughout the school from the early years through to year six and the children have the opportunity to revisit skills from previous years before learning new ones. We encourage children to express individuality in their work and to keep their own personalised sketchbooks where they can explore ideas, be inventive and take risks.

How do we plan and teach Design Technology?

One DT project is taught per term in each class. Teachers plan sequences of lessons that will build on and develop the children's skills culminating in a final piece.

The skills and knowledge that children will develop throughout each DT topic are mapped across each year group and across the school to ensure progression. The teaching of DT across the school follows the National Curriculum through the use of Design and Technology Association's 'Projects On A Page' documents. Children design products with a purpose in mind and an intended user of the products. Food technology is implemented across the school with children developing an understanding of where food comes from, the importance of a varied and healthy diet and how to prepare this.

The teaching of DT follows the design, make and evaluate cycle, with technical knowledge and relevant vocabulary shared at ea ch stage. The design process is always linked to real life, relevant contexts to give meaning to the learning. When making their products, the children are given choice and a wide range of tools and materials to choose from. When evaluating, the children are taught to evaluate their own products against the initial design criteria to see how well it has met the needs and wants of the intended user and to identify any changes that could be made.

How do we evaluate learning in Design Technology?

At the beginning of each unit, a detailed overview outlines the main learning objective alongside the skills that the children will build on and those which will follow. The opportunity to evaluate and reflect on the learning is planned for towards the end of the unit to enable the children to see how their learning is progressing and where they need to take it next. On completion of the unit of work, key assessment targets are identified and the children are able to self-assess against them. Class teachers then use the children's research and preparatory work, along with the final piece in order to make a judgement as to whether each child is working towards, at or above the expected level.

Year 1: Design Technology Curriculum Map

Planning and Evaluating

Generating Ideas & Making	Evaluating
• Explain what is being made and who it is for • Use simple design criteria to help develop ideas • Generate ideas by drawing on own experiences and knowledge • Select from a range of tools and equipment, explaining their choices • Follow rules for safety and hygiene	• Talk about design ideas and what they are making • Make simple judgements on their product based on the criteria • Suggest improvements that could be made

Unit	Mechanisms Wheels & Axels	Structures Freestanding Structures	Cooking & Nutrition Preparing Fruit & Vegetables
Overview	In this unit, the children will begin to learn about simple mechanisms. They will experiment with a range of resources before designing and making a vehicle with free running wheels. The children will experiment with different types of axel and axel holders before selecting which one to use in their design. Once their vehicle has been tested, they will evaluate how well it suits the needs of the users before thinking of what they would do differently next time.	In this unit, the children will begin to learn about simple freestanding structures. They will experiment with a range of recycled materials before selecting the best ones to use. They will experiment with different ways of making their structure more stable and will investigate the best joining techniques to use. Once completed, they will judge how effective their design has been.	In this unit, the children will begin to learn about basic cooking methods and nutrition. They will begin by exploring where a range of fruit and vegetables come from before deciding which ones to use in a simple recipe. They will then learn how to weigh and prepare the fruit and vegetables safely and hygienically before evaluating the final product and suggesting improvements which could be made.
Key Skills	• Make vehicles with construction kits which contain free running wheels e.g. tubes, dowel, cotton reels • Attach wheels to a chassis using an axle and axle holder • Join appropriately for different materials and situations • e.g. glue or tape • Mark out materials to be cut using a template • Use appropriate vocabulary	• Fold, tear and cut paper and card • Curl paper • Roll paper to create tubes • Use recycled materials • Make structures more stable by giving them a wide base • Cut along lines, straight and curved • Investigate joining techniques with different materials	• Understand that all food comes from plants or animals. • Develop a food vocabulary using taste, smell and texture. • Group familiar food products e.g. fruit and vegetables. • Grate and peel a range of ingredients. • Work safely and hygienically. • Measure and weigh food items (non-statutory measures • e.g. spoons, cups). • Prepare simple dishes safely and hygienically without a heat source.
Possible Outcomes & curriculum links	Make a moon-buggy Make push/pull toys e.g. emergency service vehicle, carnival float, farm vehicle, clown's car etc. Make a vehicle for an imaginary/story character	Design and make a structure to go in the forest Make an enclosure for farm or zoo animals Make playground/park/garden furniture Make a bridge for Billy Goats Gruff/furniture for the Three Bears	Make a fruit salad Make a fruit yogurt or jelly Make fruit and vegetable kebabs

Year 2: Design Technology Curriculum Map

Planning and Evaluating

Generating Ideas & Making	Evaluating
• Explain what is being made and who it is for • Use simple design criteria to help develop ideas then build on them using own experiences and knowledge • Explain how you will make product suitable for the intended user • Select from a range of tools and equipment, explaining your choices • Follow the rules for safety and hygiene	• Talk about design ideas and what you are making • Make simple judgements on your product based on the criteria • Suggest improvements that could be made

Unit	Mechanisms Sliders & Levers	Textiles Templates & Joining	Cooking & Nutrition Preparing Fruit & Vegetables
Overview	In this unit, the children will begin to learn about simple mechanisms. They will find out about how to create and use simple sliders and levers to make a moving picture. They will investigate methods of joining different materials before selecting the most suitable for their design. Once completed, they will evaluate how successful their design has been.	In this unit, the children will begin to develop their textiles skills. They will learn about and make their own templates to create fabric shapes. These shapes will then be joined using simple stitches before being decorated with embellishments.	In this unit, the children will continue to learn about different cooking methods and nutrition. They will continue to explore where a range of fruit and vegetables come from before deciding which ones to use in a simple recipe. They will learn how to prepare the fruit and vegetables safely and once made, they will evaluate whether their product could be improved and what you would do differently next time. Eatwell Plate.
Key Skills	• Make moving pictures using simple sliders and levers • Cut along straight and curved lines • Use a hole punch to create slots • Use paper fasteners to create movement • Cut slots under supervision • Join appropriately for different materials and situations • e.g. glue or tape • Use appropriate vocabulary	• Create own templates for fabric shapes • Cut out shapes which have been created by drawing round a template onto the fabric • Join fabrics by using running stitch and over-sewing • Decorate fabrics with buttons, beads, sequins, braids, ribbons	• Understand that food has to be farmed, grown elsewhere or caught. • Develop a food vocabulary using taste, smell and texture. • Name and sort food into the five groups on The Eatwell plate. • Grate, peel and chop a range of ingredients. • Work safely and hygienically. • Measure and weigh food items using simple standard measures (e.g. cups, spoons). • Prepare simple dishes safely and hygienically without a heat source.
Possible Outcomes & curriculum links	Create a class storybook Make a moving poster/display/greetings card Make a class information book based on topic learning	Make a glove/finger puppet of an animal Make a simple bag Make clothes for teddy/soft toy Make a placemat	Make fruit smoothies Make vegetable salads

Year 3: Design Technology Curriculum Map

Planning and Evaluating

Generating Ideas & Making	Evaluating
• Gather information about the needs and wants of particular individuals and groups • Model ideas using prototypes and pattern pieces • Use annotated sketches and diagrams to develop and communicate ideas • Select tools, equipment and materials suitable for the task and be able to explain the choice according to functional properties and aesthetic qualities • Assemble, join and combine materials and components with some accuracy	• Identify the strengths and areas for development in their ideas and products • Discuss how well the finished product meets the design criteria • Consider the views of others, including intended users, to improve their work • Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products

Unit	Textiles 2D shapes to 3D products	Structures Shell Structures (with CAD)	Cooking & Nutrition Healthy & Varied Diet
Overview	In this unit, the children will continue to develop their textiles skills. They will use templates to cut out pattern pieces which will then be joined together using a range of different stitches. They will then think about different decoration techniques and choose the most appropriate for their design.	In this unit, the children will continue to find out about structures. They will use a simple CAD system to design a shell structure, before investigating different materials that could be used. They will then investigate different methods to join and strengthen their structures.	In this unit, the children will continue to learn about a healthy and varied diet. They will find out about The Eatwell Plate and begin to understand that we need to eat a variety of different food and drink to stay healthy. They will be able to follow a recipe and begin to understand that a recipe can be adapted and changed. They will be able to safely and hygienically prepare food using a range of techniques.
Key Skills	• Create 3D products using pattern pieces • Cut out shapes which have been created by drawing round a template onto the fabric • Understand seam allowance • Join fabrics using running stitch, over sewing and back stitch • Use appropriate decoration techniques e.g. glued appliqué	• Use Microsoft Word to create nets • Prototype shell structure using card • Cut accurately and safely along a marked line • Choose materials based on their functional properties and aesthetic qualities • Investigate joining techniques with different materials • Investigate strengthening methods	• Develop sensory vocabulary and knowledge using, smell, taste, texture and touch. • Know that a healthy diet is made up from a variety of different food and drink, as depicted on The Eatwell plate. • Know that a recipe can be adapted by adding/substituting one or more ingredients. • Follow a recipe. • Grate, peel, chop, mix and spread a range of ingredients. • Join and combine a range of ingredients • Work safely and hygienically. • Measure and weigh ingredients appropriately.
Possible Outcomes & curriculum links	Make a purse/wallet Make a soft toy/mascot Make an apron or fashion accessory Make a simple bag Make a pencil case	Design and make and Anglo-Saxon house Design and make gift boxes/containers Make a desk tidy Make disposable/recyclable lunchboxes	Make a sandwich or wrap with seasonal produce Make a filled pitta pocket

Year 4: Design Technology Curriculum Map

Planning and Evaluating

Generating Ideas & Making	Evaluating
• Gather information about the needs and wants of particular individuals & groups • Model ideas using prototypes and pattern pieces • Use annotated sketches and diagrams to develop and communicate ideas • Select tools, equipment and materials suitable for the task and be able to explain the choice according to functional properties and aesthetic qualities • Assemble, join and combine materials and components with some accuracy	• Identify the strengths and areas for development in their ideas and products • Discuss how well the finished product meets the design criteria • Consider the views of others, including intended users, to improve their work • Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products

Unit	Electrical Systems Simple Circuits & Switches	Mechanical Systems Pneumatics, Levers & Linkages	Cooking & Nutrition Healthy & Varied Diet
Overview	In this unit, the children will begin to learn about electrical systems. They will construct simple electrical circuits using bulb, switches and buzzers and understand how to find a fault and how to correct it. The children will develop their technical vocabulary and be able to use it appropriately.	In this unit, the children will begin to learn about simple mechanical systems. They will use a combination of pneumatics, levers and linkages to create a moving object. They will experiment with different materials to create pivots and simple pneumatics. Once their object is created, they will evaluate how effective the design has been and what improvements could be made.	In this unit, the children will continue to develop their understanding of a healthy and varied diet. They will have a better understanding of where food comes from and will be able to analyse a range of foods. The children will have an understanding of a balanced diet and will be able to make healthy choices based on this knowledge. They will be able to prepare and combine food in a range of ways, following a recipe.
Key Skills	• Construct simple electrical circuits using bulbs, switches and buzzers • Experiment with making a range of different types of switches • Understand how to find a fault in a circuit and how to correct it • Work safely with the resources • Know and use technical vocabulary relevant to the project	• Use a combination of pneumatics, levers and linkages to create a moving object • Experiment with loose and fixed pivots • Use paper fasteners to create movement • Use syringes and squeezy bottles to create movement • Cut accurately and safely along a marked line • Use appropriate vocabulary	• Develop sensory vocabulary and knowledge using, smell, taste, texture and touch. • Analyse the taste, texture, smell and appearance of a range of foods. • Know that food is grown, reared and caught in the UK, Europe and wider world. • Follow a recipe. • Grate, peel, chop, mix, spread, slice, knead and bake a range of ingredients. • Make healthy eating choices from and understanding of a balanced diet. • Join and combine a range of ingredients e.g. • Work safely and hygienically. • Measure and weigh ingredients using scales. • Understand that seasons may affect food availability.

Year 4: Design Technology Curriculum Map (continued)

Unit	Electrical Systems Simple Circuits & Switches	Mechanical Systems Pneumatics, Levers & Linkages	Cooking & Nutrition Healthy & Varied Diet
Possible Outcomes & curriculum links	Make a pressure sensor burglar alarm Make a siren for a toy vehicle Make a reading light or illuminated sign torches Make a buzzer for school office	Make a moving class display based on topic learning Make a story book/poster/ greetings card Make a moving storyboard Make a moving tipper truck/jack-in-the-box/ toy	Make toasties Make a snack bar

Year 5: Design Technology Curriculum Map

Planning and Evaluating

Generating Ideas & Making	Evaluating
• Carry out research, using surveys, interviews, questionnaires and web-based resources • Identify the needs/wants/preferences and values of individuals and groups designing for • Model their ideas using prototypes and pattern pieces • Use computer-aided design to develop and communicate their ideas • Select tools, equipment and materials suitable for the task and be able to explain their choice according to functional properties and aesthetic qualities • Accurately assemble, join and combine materials and components • Use techniques that involve a number of steps	• Identify the strengths and areas for development in their ideas and products • Consider the views of others, including intended users, to improve their work • Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • Evaluate their ideas ad products against their original design specification • Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products

Unit	Mechanical Systems Cams, Pulleys & Gears	Structures Frame Structures	Cooking & Nutrition Celebrating Culture & Seasonality
Overview	In this unit, the children will continue to develop their understanding of mechanical systems. They will find out how to use cams, pulleys and gears to create movement. They will design and build frameworks using a range of materials to support their mechanisms and they will begin to learn how to use a range of tools safely.	In this unit, the children will continue to develop their understanding of structures. They will experiment with a range of materials and choose the most suitable based on its functional and aesthetic qualities before making a prototype. They will then create a frame structure with diagonal struts to strengthen.	In this unit, the children will continue to develop their knowledge of cooking and nutrition. They will prepare, weigh and combine food using a range of techniques controlling the cooking temperature where necessary. They will have an understanding of a healthy, balanced diet and will know how to store and handle the ingredients safely.
Key Skills	• Use a cam to make an up and down mechanism • Use pulleys and gears to create movement • Build frameworks using a range of materials e.g. wood or card to support mechanisms • Join appropriately using appropriate methods • Use a bradawl to mark hold positions • Use a hand drill to drill holes • Cut strip wood, dowel, square section wood accurately • Use appropriate vocabulary	• Prototype shell structures • Create frame structures • Make structures more stable by giving them a wide base • Strengthen shells with diagonal struts • Choose materials based on their functional properties and aesthetic qualities • Measure and mark square selection, strip and dowel accordingly to 1cm • Use glue gun with close supervision (one to one) • Investigate joining techniques with different materials	• Prepare food products controlling the temperature of the oven/hob if cooking. • Select and prepare foods for a particular purpose. • Measure and weight accurately using different equipment. • Cut and shape ingredients using appropriate tools and equipment e.g. grating, chopping. • Join and combine food ingredients appropriately e.g. beating, rubbing in. • Decorate appropriately. • Work safely and hygienically. • Show awareness of a healthy diet from an understanding of a balanced diet. • Understand the importance of correct storage and handling of ingredients. • Understand that the seasons may affect food availability.

Year 5: Design Technology Curriculum Map (continued)

Unit	Mechanical Systems Cams, Pulleys & Gears	Structures Frame Structures	Cooking & Nutrition Celebrating Culture & Seasonality
Possible Outcomes & curriculum links	Make a fairground ride with gears or pulleys e.g. carousel, Ferris wheel Create a window display with moving parts e.g. lifting or turning items for sale Make a toy with oscillating, rotating or reciprocatingmovement	Make a structure for the playground Make a market stall/bus shelter/tent/play house etc. make a shelter for a character in a book	Make savoury biscuits/scones/muffins Make celebration biscuits

Year 6: Design Technology Curriculum Map

Planning and Evaluating

Generating Ideas & Making	Evaluating
• Carry out research, using surveys, interviews, questionnaires and web-based resources • Identify the needs/wants/preferences and values of individuals and groups designing for • Sketch and model alternative ideas • Develop one idea in depth • Select tools, equipment and materials suitable for the task and be able to explain their choice according to functional properties and aesthetic qualities • Accurately assemble, join and combine materials and components • Use techniques that involve a number of steps	• Identify the strengths and areas for development in their ideas and products • Consider the views of others, including intended users, to improve their work • Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • Evaluate their ideas and products against their original design specification • Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products

Unit	Electrical Systems Monitoring & Control/More complex Switches	Textiles Combining Different Fabric Shapes	Cooking & Nutrition Celebrating Culture & Seasonality
Overview	In this unit, the children will continue to develop their understanding of electrical systems. They will construct more complex electrical circuits using simple programming tools to control them. They will understand how to modify the computer program to enable their circuit to work in response to the environment.	In this unit, the children will continue to develop their textile skills. They will understand about pattern layout and will pin and tack pieces of fabric together before joining them with a range of stitches. They will decorate the fabric and explore different types of fastenings.	In this unit, the children will continue to develop their understanding of cooking and nutrition. They will select and prepare food, taking into account its properties and sensory characteristics. They will weigh, prepare and combine the ingredients using a range of methods and equipment safely and hygienically.
Key Skills	• Construct electrical circuits using bulbs, switches and buzzers • Understand how to use a simple programming tool e.g. Crumble • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment. • Work safely with the resources • Know and use technical vocabulary relevant to the project	• Understand pattern layout • Decorate textiles appropriately often before joining components • Pin and tack fabric pieces together • Join fabrics using over sewing, back stitch, blanket stitch or machine stitching • Combine fabrics to create more useful properties • Explore fastenings and recreate some e.g. sew on buttons and make loops	• Prepare food products taking into account the properties of ingredients and sensory characteristics • Select/prepare foods for a particular purpose. • Taste a range of ingredients and food items to develop a sensory food vocabulary for use when designing own recipes. • Measure and weigh accurately. • Cut and shape ingredients using appropriate tools and equipment e.g. grating, chopping. • Join and combine food ingredients appropriately e.g. beating, rubbing in. • Decorate appropriately. • Work safely and hygienically. • Show awareness of a healthy balanced diet. • Understand that different food and drink contains different substances needed for health. • Understand how food is processed into ingredients that can be eaten or used in cooking.

Year 6: Design Technology Curriculum Map (continued)

Unit	Electrical Systems Monitoring & Control/Morecomplex Switches	Textiles Combining Different Fabric Shapes	Cooking & Nutrition Celebrating Culture & Seasonality
Possible Outcomes & curriculum links	Make a cycle or vehicle alarm Make a security lighting system Make an alarm for valuable artefact Make a garden light/automatic nightlight	Make a tablet or mobile phone carrier Make a shopping bag Make a hat/cap Make a fabric advent calendar	Make bread Make pizza Make soup