



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.

Key Stage 1 subject content

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].

Key Stage 1 cooking and nutrition

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



Girlington Primary School Design and Technology Curriculum

Year 1

	Autumn	Spring	Summer
Prior EYFS learning	Explore different materials freely, to develop their ideas about how to use them and what to make. Develop manipulation and control. Join different materials. Explore different materials and tools. Build independently with a range of appropriate resources. Use one-handed tools and equipment.	Explore different materials freely, to develop their ideas about how to use them and what to make. Join different materials. Create collaboratively, sharing ideas, resources and skills. Build independently with a range of appropriate resources. Use one-handed tools and equipment.	Explore different materials, using all their senses to investigate them. Learn about the importance of making healthy choices with regard to food. Eat finger food independently. Use one-handed tools and equipment. Use a range of small tools, including cutlery. Use a knife to spread.
Topic	Textiles: Design and make a hand puppet to help you to tell a story.	Resistant Materials: Design and make a durable toy vehicle with freely moving wheels.	Cooking and Nutrition: Design and make a healthy sandwich.
National Curriculum Subject Content			
Design	design purposeful, functional, appealing products for themselves based on design criteria generate, develop, model and communicate their ideas through talking and drawing	design purposeful, functional, appealing products for themselves and other users based on design criteria generate, develop, model and communicate their ideas through talking, drawing, and making mock-ups	design purposeful, functional, appealing products for themselves and other users based on design criteria generate and communicate their ideas through talking and drawing
Make	select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining] select from and use a wide range of materials and components	select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], according to their characteristics select from and use a wide range of materials and components	select from and use a range of tools and equipment to perform practical tasks select from and use a wide range of ingredients, according to their characteristics
Evaluate	evaluate their ideas and products against design criteria	explore and evaluate a range of existing products evaluate their ideas and products against design criteria	explore and evaluate a range of existing products evaluate their ideas and products against design criteria
Technical	build structures, exploring how they can be made stronger and more stable	build structures, exploring how they can be made stronger and more stable explore and use mechanisms [for example, levers, wheels and axles], in their products	
Cooking and Nutrition			use the basic principles of a healthy and varied diet to prepare dishes understand where food comes from.
Activities	Explore the purpose(s) of puppets, discuss and agree simple design criteria that children can easily remember. Evaluate the function and appeal of existing puppet designs and their component parts against the agreed criteria. Use real-life examples. Select the materials, components, tools and equipment that might or might not be used for the main body and its parts in order to meet the design criteria. Discuss, make models, make mock-ups and draw sketches of ideas. Improve designs by discussing, remodelling and redrawing. Use PVA tacky glue to join two pieces of pre-cut felt together and to attach other components. Test puppets by using them to perform a story. Evaluate their effectiveness against the design criteria.	Learn about fixed and moving axles using tech card. Explore the purpose of toy vehicles. Discuss and agree simple design criteria that children can easily remember. Evaluate the function, appeal, strength and durability of existing toy vehicles, the materials used and methods of manufacture. Use real-life examples. Select the materials, components, tools and equipment that might or might not be used. Explore differently-sized and shaped pieces of pre-drilled wood with axles, wheels, pivots and other fittings. Mock-up, photograph, sketch, discuss and evaluate your ideas. Propose some designs, referring to the design criteria. Select a design that you would like to make. Drill holes, cut dowel, join wheels to fixed or moving axles, sand, glue and finish. Test and evaluate your toy against the design criteria.	Explore how some food comes from animals and some from plants. Look in the school garden for examples. Sort into these two groups. Learn that preparation can involve washing, peeling, chopping, mashing and grating. Practise the procedures needed to safely chop, mash, tear, grate and peel food. Complete a table to show the effectiveness of these methods. Evaluate the different foods and procedures by comparing them. Evaluate a range of supermarket sandwiches. Refer to taste, feel, ease of use, mess, whether they are filling, healthiness and appearance. Select ingredients that will meet the given design criteria. Identify the source of your ingredients. Draw a picture of your design. Select an appropriate procedure, appropriate sizes and appropriate amounts. Follow your picture as you assemble. Test and evaluate, proposing improvements.
Vocabulary	purpose, evaluate, part, material, felt, PVA glue, body, model, sketch, felt, attach	fixed axle, moving axle, evaluate, durable, strong, material, part, tool, junior hacksaw, measure, mark out, cut, sand, smooth, finish, sandpaper, glue, make, join, stick, test	meat, fruit, vegetables, animals, plants, wash, peel, chop, mash, grate, tear, fresh, bland, healthy, cheese, chickpeas, tuna, avocado, cucumber, pepper, spring onion, carrot, lettuce, preparation, knife, evaluate



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Year 2

	Autumn	Spring	Summer
Additional prior EYFS learning	Drink from an open cup.		Hold a pencil effectively in preparation for fluent writing – using the tripod grip in almost all cases. Begin to show accuracy and care when drawing.
Topic	Cooking and Nutrition: Design and make a healthy fruit drink.	Textiles: Design and make a decorative bookmark gift.	Resistant Materials: Design and make a free-standing picture frame.
National Curriculum Subject Content			
Design	design purposeful, functional, appealing products for themselves based on design criteria generate, develop, model and communicate their ideas through talking and drawing	design purposeful, functional, appealing products for other users based on design criteria generate, develop, model and communicate their ideas through talking, drawing, and using information and communication technology	design purposeful, functional, appealing products for themselves based on design criteria generate, develop, model and communicate their ideas through talking, drawing, models and mock-ups
Make	select from and use a range of tools and equipment to perform practical tasks select from and use a wide range of materials and components	select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining]. select from and use a wide range of materials and components, including textiles, according to their characteristics	select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] select from and use a wide range of materials according to their characteristics
Evaluate	explore and evaluate a range of existing products evaluate their ideas and products against design criteria	explore and evaluate a range of existing products evaluate their ideas and products against design criteria	explore and evaluate a range of existing products evaluate their ideas and products against design criteria
Technical		build structures, exploring how they can be made stiffer	build structures, exploring how they can be made stronger and more stable explore and use mechanisms [for example, pivots (hinges)], in their products.
Cooking and Nutrition	use the basic principles of a healthy and varied diet to prepare dishes understand where food comes from		
Activities	In science, learn what a balanced diet is and sort food into the five groups. Explore the purpose of healthy fruit drinks. Select and record appropriate design criteria from a given list. Evaluate the look and taste of a selection of existing fruit drinks. Learn how different tools and equipment can be used to prepare fruit and make it into juice. Select tools and equipment that might or might not be used for different processes. Select a base juice and two further ingredients that will meet the design criteria. Prepare, process and blend the ingredients using the correct equipment and methods. Test and evaluate, suggesting possible future improvements.	Explore the purpose of bookmarks. Consider and decide who would like one as a gift. Evaluate a wide range of bookmarks according to their durability, stiffness, visual appeal, size and shape. Generate design criteria referring to the aspects above. Provide pieces of binka and hessian (a.k.a burlap), as well as a range of possible stiffening materials (variety of card, plastics & wood), and a range of sewing equipment and materials. Make models and mock-ups, selecting and deselecting ideas, materials and equipment according to their purposefulness, properties and usefulness. Teach children how to sew running stitch with a plastic needle and hessian / binka. Generate design ideas by talking, sketching and using ICT. Use books of the size that the gift recipient would use to help decide dimensions. Make bookmarks, using knowledge gained, designs generated and pattern pieces made. Evaluate bookmarks against design criteria.	Explore the purpose of picture frames. Evaluate a wide range of frames. Consider how the materials and joints used contribute towards their function, strength and visual appeal. Generate design criteria referring to the aspects above. Make models and mock-ups of frames along with ways to stand them up so that they are stable. Provide plywood, hardboard, MDF for the backing piece, square and rectangular section softwood for the frame, and thick card for stands and supports. Show how a fixed-axle pivot could be used. Evaluate design ideas in light of design criteria, and select a design to make. Teach how to measure, mark out and cut straight lines using a ruler, pencil, try square and junior hack saw. Use sandpaper to give a smooth finish. Make frames and stands, adding embellishments. Evaluate picture frames against design criteria.
Vocabulary	purpose, evaluate, existing, product, juice, taste, healthy, ingredients, select, appropriate, practical, task, explain, might, will	durability, stiffness, evaluate, binka, hessian, burlap, plastic, wood, sheet, needle, wool, thread, knot, over, under, computer aided design (CAD), pattern, template	material, joint, strength, stable / stability, plywood, hardboard, MDF, square, rectangle, softwood, fixed axle, pivot, hinge, try square, junior hack saw, sandpaper



Key stage 2 subject content

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].

Key stage 2 cooking and nutrition

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



Girlington Primary School Design and Technology Curriculum

Year 3

	Autumn	Spring	Summer
Additional prior EYFS learning	Share their creations, explaining the process they have used.		
Topic	Textiles: Design and make a bracelet for a friend.	Resistant Materials: Design and make a mechanical toy.	Cooking and Nutrition: Design and make a healthy hummus dip.
National Curriculum Subject Content			
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 and computer-aided design	use research and develop design criteria to inform the design of functional, appealing products that are fit for purpose, aimed at particular individuals or groups generate, develop, model and communicate their ideas through discussion and prototypes	use research and develop design criteria to inform the design of appealing products that are fit for purpose generate, develop, model and communicate their ideas through discussion
Make	select from and use a wider range of tools and equipment to perform practical tasks select from and use a wider range of materials and components, including textiles, according to their functional properties and aesthetic qualities	select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately select from and use a wider range of materials and components according to their functional properties	select from and use a wider range of tools and equipment to perform practical tasks select from and use a wider range of materials and components, including ingredients, according to their functional properties
Evaluate	investigate and analyse a range of existing products evaluate their ideas and products against their own design criteria understand how key events and individuals in design and technology have helped shape the world	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	investigate and analyse a range of existing products evaluate their ideas and products against their own design criteria
Technical	apply their understanding of computing to program, monitor and control their products	apply their understanding of how to strengthen more complex structures understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]	
Cooking and Nutrition			understand and apply the principles of a healthy and varied diet prepare 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 and processed
Activities	Learn how to weave using a basket template. Learn about different materials that can be woven. Learn about the history of weaving, including the impact of mechanised production on weaving and woven products (especially in Bradford); compare this to bespoke craft and cottage industry. Investigate and evaluate a range of woven products and bracelets. Explore the purpose of friendship bracelets and generate design criteria. Consider how to make it special for your friend. Investigate the limitations and possibilities when weaving by hand, including using patterns and computer-aided design. Design and make a friendship bracelet, planning its manufacture using appropriate tools, equipment, techniques and patterns. Involve the user in the evaluation.	Hands-on investigation of products containing mechanisms. Make and explore levers, sliders and linkages. Make and evaluate a machine containing a cam, exploring and solving the potential problems, e.g. alignment, friction, stiffness. Find out what year 1 users would like a mechanical toy to be like. Complete a list of design criteria, taking into account the desires of the user. Produce a labelled drawing, a list of materials and a plan of manufacture. Accurately measure, mark out, cut, drill and assemble a structure including a mechanism using MDF, softwood and dowel. Explain how your automaton works and evaluate your design by explaining both the manufacturing process and the finished product. Visit Bradford Industrial Museum and watch the weaving machinery in action. Identify sliders, levers, pulleys, linkages and cams.	Learn about food groups and study food packaging to determine the benefits and drawbacks of different food products. Learn about the origins, ingredients and health benefits of hummus. Evaluate a range of bought dips, recording opinions about appearance, smell, taste and texture. Discuss and decide which flavours of hummus dip we would enjoy. Discuss and decide what kinds of vegetables and other products could be used to dip. Learn how to make hummus using appropriate tools and equipment. Recall and suggest what equipment, procedures and techniques would be needed to safely prepare vegetables, pitta bread etc. for dipping. Work hygienically and safely when making hummus and preparing dippers. Test and evaluate the finished products, comparing their quality with those bought and suggesting reasons for preparing your own food from ingredients rather than buying it ready-made.
Vocabulary	friend, user, weave, wove, weaving, wool, thread, bracelet, limitation, possibility, bespoke, craft, mechanical, mechanised, cottage industry, pattern, computer-aided design (CAD)	mechanism, machine, automaton, shaft (moving axle), lever, slider, linkage, cam, pulley, friction, user, drill, bench drill, drill bit	fruit, vegetables, starch, carbohydrates, dairy, proteins, fat, water, vitamins, minerals, knife, chopping board, safely, blender, food processor, hummus, pepper, chilli, caramelised, onion, hygiene, health, processed food



Girlington Primary School Design and Technology Curriculum

Year 4

	Autumn	Spring	Summer
Topic	Textiles: Design and make a pencil case.	Cooking and Nutrition: Design and make a healthy packed lunch.	Resistant Materials: Design and make a child's night light.
National Curriculum Subject Content			
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, prototypes and pattern pieces	use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose develop and communicate their ideas through discussion, annotated sketches and cross-sectional diagrams	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, exploded diagrams and prototypes
Make	select from and use a wider range of tools and equipment to perform practical tasks accurately select from and use a wider range of materials and components, including textiles, according to their functional properties and aesthetic qualities	select from and use a wider range of tools and equipment to perform practical tasks accurately select from and use a wider range of materials and components, including ingredients, according to their functional properties.	select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately select from and use a wider range of materials and components 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	evaluate their ideas and products against their own design criteria understand how key events and individuals in design and technology have helped shape the world	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	apply their understanding of how to strengthen, stiffen and reinforce more complex structures		apply their understanding of how to strengthen, stiffen and reinforce more complex structures understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] apply their understanding of computing to program, monitor and control their products
Cooking and Nutrition		understand and apply the principles of a healthy and varied diet prepare a variety of predominantly savoury dishes using a range of techniques understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed	
Activities	Discuss and record the purpose of a pencil case. Develop a specification for your own design. Investigate a range of existing pencil case designs. Consider the materials, joining methods and appearance. Model a range of ideas using paper, considering to what degree these ideas will meet the design specification. Select tools and equipment by sorting into into three categories: must use, could use and should not use. Practice joining felt together using a chenille needle with embroidery thread. Use running stitch, learn how to use whip stitch; learn how to attach buttons, zips and applique. Use this experience to inform your choice of design and choices of fasteners and other embellishments. Discuss your choices, considering others' views. Use a pattern piece to help you to locate the position of folds, joins, cuts, fasteners and applique. Test and evaluate your finished design.	Consider the purpose of a packed lunch. Discuss the situations where designing and making a packed lunch might be appropriate. Record a mind-map design specification to include references to health, cost, nutrition, safety, seasonality, air miles, variety, storage and transport. Select ingredients that comply with the specification. Present a labelled cross-sectional diagram of your main dish to show the variety of ingredients that make it up. Make your lunch safely and hygienically using the correct tools and equipment. Package the main dish so that it can be refrigerated, transported and eaten safely and tidily with minimum waste. Learn about the idea that decay can be slowed when food is stored at lower temperatures. Learn about how food has been preserved through history, including the availability of household electricity and the development of the refrigerator. Comment on the success of your lunch in light of your experience and the specification. Discuss what you have remembered and learnt about the health, nutritional and cost benefits of preparing your own food.	Consider the purpose of a child's night light. Begin with a simple cell & bulb circuit, then generate a design specification that would make a night light fit for purpose. Learn about the properties and uses of clear acrylic, especially its ability to display refracted light along its edges and how this idea is used in signage to attract attention. Consider the development of lighting from the filament bulb to LEDs, and the development of laser technology for cutting and engraving. Conclude that developments in technology can vastly improve design quality and variety. Suggest how to support a piece of acrylic so that it displays light from an LED strip when standing up. Develop ideas by trying out materials, studying tools and equipment, discussing and modelling ideas. Evaluate proposed ideas against the design criteria. Select the most effective designs to make. Using a BBC Micro:Bit, develop algorithms for a lighting (and, optionally, sound) effect that would help a child to relax and go to sleep. Cause the light to turn on when it is dark and off when light, and/or to be controlled by a timer. Use a ruler, pencil and try square for marking out. Select from a bench hook, vice, junior hack saw, bench drill, sandpaper glue, softwood, dowel, screws, washers and soft feet. Consider others' views when making. Learn how to use Tinkercad to draw 3-d computer aided designs. Draw an exploded diagram using CAD.
Vocabulary	specification (a list of design criteria), specify, specific, model, felt, needle, thread, whip stitch, button, zip, applique, pattern piece, locate, location	specification, health, cost, nutrition, seasonality, air miles, transportation, cross-section, cross-sectional diagram, hygiene, hygienic, unhygienic, electricity, technology, refrigeration, refrigerator	cell, battery, bulb, specification, properties, edge, filament bulb, light emitting diode, emit, laser, CAD (computer aided design), C.A.M. (computer-aided manufacture), engrave, technology, algorithm, control, bench drill, drill bit



Girlington Primary School Design and Technology Curriculum

Year 5

	Autumn	Spring	Summer
Topic	Textiles: Design and make a hat to keep your head warm during Ingleborough Hall week.	Cooking and Nutrition: Design and make a healthy soup that could be made in a large batch.	Resistant Materials: Design and make a device that will attract bees to a garden.
National Curriculum Subject Content			
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	use research and develop design criteria to inform the design of functional, appealing products that are fit for purpose, aimed at particular groups generate, develop and communicate their ideas through discussion	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 accurately select from and use a wider range of materials and components, including textiles, according to their functional properties and aesthetic qualities	select from and use a wider range of tools and equipment to perform practical tasks 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	select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately select from and use a wider range of materials and components 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	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	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	apply their understanding of how to strengthen and reinforce more complex structures	apply their understanding of computing to program, monitor and control their products	apply their understanding of how to strengthen, stiffen and reinforce more complex structures
Cooking and Nutrition		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	
Activities	<p>Research activities, weather conditions and outdoor clothing needed for our trip to Ingleborough Hall. Consider what a hat may need to be like and record a design specification.</p> <p>Research and analyse a range of existing hat designs. Suggest which ones may be suitable or not, giving reasons. Take note of any designs that use more than one layer for insulation and durability. Consider incorporating this.</p> <p>Use paper to model and mock-up design ideas. Aim for a compromise between the least amount of material necessary to provide sufficient warmth (coverage) and an appealing design. Suggest ideas that need compound curves to fit the head snugly.</p> <p>Learn backstitch and blanket stitch. Compare these to previously learned running stitch and whip stitch. Discuss what kinds of stitches would be best for different parts of designs.</p> <p>Generate and annotate some design ideas using cross-section and exploded views to show the detail.</p> <p>As a class, select which designs to. Work in collaboration, as designers do, to challenge designs, referring to the specification. Teachers promote an understanding about the limitations of materials and resources.</p> <p>Select the most successful designs to make. Use templates and patterns to mark out, measure and cut pieces. Assemble hats using appropriate stitching, and add applique embellishments.</p> <p>Keep hats aside until the residential trip. After completing a few activities, evaluate your hat according to your specification.</p>	<p>Explore research about unhealthy eating habits in the UK, including the consumption of processed food from supermarkets and take-aways.</p> <p>Evaluate flavour and health factors of a range of shop-bought soups, including use of preservatives.</p> <p>Explore batch production - its history, examples and reasons why it can be efficient for some products. Discuss the idea that batch cooking can be an effective and time-efficient way of preparing healthy food to feed a family.</p> <p>Record a specification that references production methods, meeting the needs of a variety of people, health, cost, nutrition, safety (including re-heating), air miles and storage.</p> <p>Design a computer program that will use a micro:bit to give feedback about the required re-heating temperature.</p> <p>Make decisions about combinations of ingredients, seasoning and flavours that would comply with the specification. Suggest what tools and equipment could be used to prepare and cook different designs of soup.</p> <p>Make your soup safely and hygienically using appropriate tools and equipment. Package your soup in re-useable, air-tight containers suitable for fridge or freezer. Label with safety information relating to freezing and refrigeration.</p> <p>Take some soup home to share. Ask others to complete a survey honestly to help us to evaluate our soups.</p> <p>Evaluate the soups in light of the specification and users' survey results.</p>	<p>Explore the idea that design comes from need and can be very effective in shaping the world. In this case there is a need to address climate change. Learn about the importance of bees and how to encourage them to thrive. Generate some design ideas for possible ways of attracting pollinators.</p> <p>Investigate and analyse a range of products already available.</p> <p>Write a design specification with reference to durability, weather resistance, material cost, size, sustainability, ease of manufacture, and position.</p> <p>Host a design workshop, where children model, mock-up, discuss and present ideas. They are given potential materials (some pre-cut, drilled and shaped) including inappropriate ones (e.g. steel hinges that may rust). They sketch their ideas to aid discussion, including cross-sectional sketches and exploded views of parts that fit together, for example.</p> <p>As a class, select which designs to pursue further. Work in collaboration, as designers do, to challenge one another's designs, referring to the specification. Teachers will need to promote an understanding about the limitations of materials and resources.</p> <p>Children choose the most successful designs to make. They measure, mark out, cut and drill materials, assembling with exterior wood glue, pins, screws and/or dowels. They apply materials or finishes that will be weatherproof.</p>
Vocabulary	specification, suitable, layer, insulation, compromise, compound curve, snug, backstitch, blanket stitch, cross-section, exploded diagram, exploded view, collaborate, collaboration	consume, consumer, consumption, process, processed food, factor, preserve, preservative, sugar, chemicals, batch, batch production, efficient, compromise, nutrition, air miles, algorithm, sensor, minimum temperature, combine, combination, seasoning, package, air-tight, survey	need, climate, climate change, human factors, thrive, investigate, analyse, collaborate, sustainability, manufacture, cross-section, exploded diagram



Girlington Primary School Design and Technology Curriculum

Year 6

Year 6	Autumn 1	Autumn 2	Summer
Topic	Resistant Materials: Design and make a decorative clock.	Textiles: Design and make a tote bag.	Cooking and Nutrition: Design and make a healthy tray bake.
National Curriculum Subject Content			
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 and pattern pieces.	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	use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design
Make	select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately select from and use a wider range of materials and components, according to their functional properties and aesthetic qualities	select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately select from and use a wider range of materials and components, including, according to their functional properties and aesthetic qualities	select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities
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	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	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	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]	apply their understanding of how to strengthen, stiffen and reinforce more complex structures apply their understanding of computing to program, monitor and control their products	apply their understanding of how to strengthen, stiffen and reinforce more complex structures
Cooking and Nutrition			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
Activities	Give and explain the design brief. Evaluate a range of existing clock designs: <ul style="list-style-type: none"> Sort them into 'more decorative', 'more functional' and 'an effective compromise' sections on a Venn diagram. Record ideas about the purpose of and specification for a decorative and functional clock. Propose which of the designs is most effective and explain why, citing design criteria. Use a range of materials and equipment to help investigate ways in which a clock could be designed and assembled. Collaborate to suggest which ideas and designs could be the most effective and why. Critique and challenge the designs, interrogating designers to result in further improvements. Select appropriate and inappropriate tools and equipment by sorting. Propose a design idea that you will make. Sketch it from different viewpoints and draw an exploded view to show how it might be assembled. Refer to some components using mechanical advantage (e.g. a screw is an inclined plane wrapped around a cylinder) Make clocks using all of the helpful information that you have collated and planned. Evaluate clocks, with reference to both the specification and the process, e.g. How did really interrogating our ideas contribute to better designs?	Learn about key events in WW2 that led to the 'make do and mend' movement. Consider why a modern make do and mend culture would be a positive idea. Share and discuss the design brief. Examine and/or disassemble existing tote bags, analysing the different features and their purposes. Explore how pattern pieces might have been used in the manufacturing process. Discuss one-off, small batch and mass production (especially that which involves CAD/CAM) and where each one might be the most appropriate method. Write a specification including criteria about a target customer, the environment, aesthetics, function, materials and performance. Learn two methods of making a hem. Discuss why hems are important and carry out a comparative test for the two methods. Mock-up, model, sketch and annotate possible ideas for bags. Introduce a CAD method to create pattern pieces. Print, assemble and refine until pattern pieces work well together. Propose a final design including annotated design drawings to show details, e.g. proposed stitch choice from running, whip-, back- and blanket stitch; hems, applique, embroidery, printing, fasteners etc. Make your bag using all of your previous knowledge. Evaluate your finished product. Review the design and manufacture process, highlighting what the benefits and drawbacks of CAD are in which circumstances.	Investigate dietary factors that lead to good heart-health as part of the Blood Heart project. Evaluate flavour and health factors of a range of shop-bought snack bars. Analyse the ingredients and study the packaging to establish how truthful packaging messages are. Pose the questions, 'Could we design and market a genuinely healthy snack bar? Is there room in the market for a snack that has a unique selling point of being genuinely healthy and totally honest with consumers?' Our design brief is to design and make a large quantity of these and to sell them for a profit. Record a specification that references honesty, health benefits, nutritional value, environmental costs (including (packaging) materials and air miles), production methods and meeting the needs of a target audience. Research recipe ideas and production methods in light of the specification, making reasonable judgements and projections about how compatible others' ideas are with our specification. Make decisions about production methods, the need (or not) for packaging, combinations of ingredients, seasoning and flavours that would comply with the specification. Critically evaluate ideas and work collaboratively to hone every factor of design, production and marketing so that success is almost certain. Market, make and sell the snack bars. Produce an evaluation report which identifies the successes of the product(s) and processes and proposes next steps for the company.
Vocabulary	design brief, decorative, functional, purpose, specification, criteria, exploded view, process, interrogate, acrylic, swarf (shavings that come off the material when drilling), assemble, mechanical join, chemical join	design brief, disassemble, pattern piece, one-off, small batch, mass production, target customer / audience / user, aesthetics, iron, iron-on strip, CAD, hem	diet, dietary, packaging, market, marketing, unique, USP, Unique Selling Point, nutritional value, environmental costs, target audience, end user, consumer, combination, compatibility, criticise, critical, critique, hone, proposal



Subsequent Key Stage 3 Learning

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 domestic and local contexts [for example, the home, health, leisure and culture], and industrial contexts [for example, engineering, manufacturing, construction, food, energy, agriculture (including horticulture) and fashion].

Cooking and nutrition:

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

Design	<p>use research and exploration, such as the study of different cultures, to identify and understand user needs</p> <p>identify and solve their own design problems and understand how to reformulate problems given to them</p> <p>develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations</p> <p>use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses</p> <p>develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools</p>
Make	<p>select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture</p> <p>select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties</p>
Evaluate	<p>analyse the work of past and present professionals and others to develop and broaden their understanding</p> <p>investigate new and emerging technologies</p> <p>test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups</p> <p>understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists</p>
Technical Knowledge	<p>understand and use the properties of materials and the performance of structural elements to achieve functioning solutions</p> <p>understand how more advanced mechanical systems used in their products enable changes in movement and force</p> <p>understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]</p> <p>apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers].</p>
Cooking and nutrition	<p>understand and apply the principles of nutrition and health</p> <p>cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet</p> <p>become competent in a range of cooking techniques [for example, selecting and preparing ingredients; using utensils and electrical equipment; applying heat in different ways; using awareness of taste, texture and smell to decide how to season dishes and combine ingredients; adapting and using their own recipes]</p> <p>understand the source, seasonality and characteristics of a broad range of ingredients.</p>