# Gresham Primary School's Design and Technology Curriculum

## Mission Statement

Gresham pupils are problem solving their way to a successful, sustainable future

**Intent**

- Pupils develop the processes of creative thinking; problem solving; questioning and research; purposeful designing; fine motor skills and evaluative reflection.
- Pupils work through the essential elements and concepts of Design and Technology which are to research, design and make, learn focused practical skills and carry out product analysis.
- Pupils become independent, creative and innovative problem solvers.
- Pupils learn to reflect on present and past technologies, evaluating their effectiveness.
- Pupils become critical, informed users of products, enabling them to aspire to become innovators in their own right.
- Pupils develop an understanding of the role finance and the links to business.
- Pupils learn how to consider sustainability within their product design.
- Pupils develop team work, alongside communication and presentational skills.
- Pupils have a rich knowledge of how to prepare themselves healthy and balanced meals.

**Implementation**

- Gresham has adapted award-winning published schemes to suit the DT vision and cohort of children. The units are fully progressive and provide solid building blocks to develop knowledge, skills and concepts. This covers and greatly enhances the learning as set out in the National Curriculum.
- The curriculum map ensures teachers know what children have encountered before and can make links to previous learning to support children making connections and building schema.
- Key concepts have been identified and are regularly returned to, gradually developing pupils' understanding of the most important ideas.
- Key vocabulary is explicitly taught to children as part of quality-first teaching.
- Pupils will engage in three different types of DT lessons: Investigative and Evaluative Activities (IEAs) where children learn from a range of existing products and find out about D&T in the wider world; Focused Tasks (FTs) where children are taught specific technical knowledge, designing skills and making skills; and Design, Make and Evaluate Assignment (DMEA) where children create functional products with users and purposes in mind.
- Teachers will teach units themed around each of the core strands – Structures, Textiles, Cooking and Nutrition, Mechanism and Electrical Systems, allowing children the opportunity to build incrementally on previously learned knowledge and skills.
- Children are introduced to great designers and engineers from the STEM disciplines and encouraged to understand how they have contributed to the world and technological advancement.
- Our Gresham Learning Super Heroes are integrated into everyday learning, helping children to become skilled, life-long learners.
- Children's books show cohesion between taught sessions with clear end points reached.
- Retrieval opportunities are planned for by teachers, to ensure children have opportunity to secure new knowledge.

**Impact**

Books, pupil voice, display and collection of work to show the following:

- Pupils will have clear enjoyment and confidence in design and technology that they will then apply to other areas of the curriculum.
- Pupils will ultimately know more, remember more and understand more about Design Technology, demonstrating this knowledge when using tools or skills in other areas of the curriculum and in opportunities out of school.
- The large majority of pupils will achieve age related expectations in Design Technology.
- As designers, pupils will develop skills and attributes they can use beyond school and into adulthood.
- Pupils with SEND will be fully included and will progress well related to their starting points.
- Pupils from disadvantaged backgrounds will benefit from the cultural capital that is offered through our DT curriculum.

## The Essential Elements

Something, for someone, with some purpose

1. **User** – children have a clear idea of who they are designing and making products for, considering their needs, wants, interests or preferences. The user may be themselves, an imaginary character, another person, client, consumer or a specific target audience.

2. **Purpose** – children know what the products they design and make are for. Each product performs a clearly defined task that can be evaluated in use.

3. **Functionality** – children design and make products that function in some way to be successful. Products often combine aesthetic qualities with functional characteristics. We recognise that in D&T, it is insufficient for children to design and make products which are purely aesthetic.

4. **Design Decisions** – when designing and making, children have opportunities to make informed decisions such as selecting materials, components and techniques and deciding what form the products will take, how they will work, what task they will perform and who they are for.

5. **Innovation** – when designing and making, children have scope to be original with their thinking. Projects are planned that encourage innovation, lead to a range of design ideas and products being developed. These projects are characterised by engaging, open-ended starting points for children's learning.

6. **Authenticity** – children design and make products that are believable, real and meaningful to themselves i.e. not replicas or reproductions or models which do not provide opportunities for children to make design decisions with clear users and purposes in mind.

## Key Concepts
### Big Ideas Revisited Across Units

| Innovation | Problem Solving | Sustainability | Research | Purposeful Design | Functionality | Iteration | Evaluative Reflection |
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| The creation, development and implementation of a new product. | Finding solutions to difficult or complex issues through product design. | Avoidance of the depletion of natural resources in order to maintain an ecological balance | Investigating to discover information to inform or review design. | Deliberate, purpose-directed, goal-oriented, intentioned design. | Being useful, practical, and right for the purpose for which something was made | A cyclic process of prototyping, testing, analysing, and refining a product or process. | To analyse and review ideas, designs and products. |

# EYFS & KEY STAGE 1

## NC Statutory Programme of Study KS1

### 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:

**Design**

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

### Cooking and Nutrition

- use basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from

**Make**

- 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 and components, including construction materials, textiles and ingredients, according to their characteristics

**Evaluate**

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria

**Technical knowledge**

- build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

| | Unit being taught… | Pupils will be learning… | Key Vocabulary | Knowledge, Skills and Understanding… |
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| **EYFS** | **Various topics** | Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen or one which is suggested to them.<br>Use large-muscle movements to wave flags and streamers, paint and make marks.<br>Choose the right resources to carry out their own plan.<br>Use one-handed tools and equipment, for example, making snips in paper with scissors.<br>Explore how things work.<br>Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park.<br>Explore different materials freely, in order to develop their ideas about how to use them and what to make.<br>Develop their own ideas and then decide which materials to use to express them.<br>Create closed shapes with continuous lines, and begin to use these shapes to represent objects. | | |

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| | | Progress towards a more fluent style of moving, with developing control and grace.<br>Develop their small motor skills so that they can use a range of tools competently, safely and confidently.<br>Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.<br>Explore, use and refine a variety of artistic effects to express their ideas and feelings.<br>Return to and build on their previous learning, refining ideas and developing their ability to represent them.<br>Create collaboratively, sharing ideas, resources and skills<br>Use a range of small tools, including scissors, paintbrushes and cutlery<br>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.<br>Share their creations, explaining the process they have used. | | |
| **Year 1** | **Pirate Paddy's Packed Lunch Problems**<br><br>**STRUCTURES** | • How to create their own ideas following a design criteria<br>• How to create model lunch boxes from reclaimed materials<br>• How structures can be made stronger, stiffer and more stable | tools, equipment, materials, make, structure, join, tape, hinge, protect, stronger, stiffer, waterproof, criteria, evaluate, lunch box, specification | Explore and evaluate a range of existing products in the context of evaluating the basket used to transport the pirates' lunch<br>Explore and evaluate a range of existing products in the context of evaluating existing lunch boxes<br>Select from and use a wide range of materials according to their characteristics in the context of exploring materials that could be used to make the lunch box.<br>Design purposeful, functional, appealing products for themselves and other users based on design criteria in the context of designing a new lunch box that can move between the pirate ships<br>Select from and use a wide range of materials according to their characteristics in the context of selecting and using the correct tools and equipment to make a lunch box.<br>Explore their ideas and products against design criteria in the context of testing the lunch box and then evaluating it against the design criteria.<br>Explore their ideas and products against design criteria in the context of testing the lunch box and then evaluating it against the design criteria.<br>Build structures, exploring how they can be made stronger, stiffer and more stable in the context of making improvements to my product. |
| | **Dips and Dippers**<br><br>**FOOD** | • About food hygiene rules and safety<br>• To make and evaluate healthy dips and dipper<br>• To develop knowledge of the Eatwell plate<br>• To explain the importance of eating a healthy and varied diet | ingredients, dips, evaluate, senses, dippers, taste, smell, equipment, dairy, protein, carbohydrate, diet, appearance, method, design, balanced diet, sensory, texture, starchy | Explore and evaluate a range of existing products in the context of comparing different dips.<br>To understand where foods comes from.<br>Explore a range of existing products in the context of comparing different dippers.<br>Use the basic principles of a healthy and varied diet in the context of comparing different ingredients in dips and dippers.<br>To select from and use a range of tools and equipment to perform practical tasks (for example, cutting) in the context of making a Dip and Dipper<br>Design purposeful, functional, appealing products for themselves and other users based on design criteria in the context of designing a new dip. Generate, develop, model and communicate their ideas through talking and drawings.<br>Use the principles of a healthy and varied diet to prepare dishes in the context of following a design to make a new dip and dipper and then evaluating it. Evaluate their ideas and products against design criteria. |
| | **Our Fabric Faces**<br><br>**TEXTILES** | • The names of different fabrics<br>• How to manipulate fabrics and create different effects<br>• How to join fabrics How to use running stitch | criteria, tools, template, annotated, evaluate, design, sew, cross-stitch, join, staple, glue, explore, textiles, lace, cut, attach, felt, corduroy, hessian | Explore and evaluate a range of existing products in the context of exploring fabrics and fabric dolls/characters.<br>Explore and evaluate a range of existing products in the context of exploring what has been used to make hair on fabric dolls or characters.<br>Select from and use a range of textiles according to their characteristics in the context of selecting materials to represent their own hair.<br>Select from and use a range of tools and equipment to perform practical tasks for example joining in the context of joining fabrics and materials.<br>Select from and use a range of tools and equipment to perform practical tasks for example cutting in the context of cutting around a template to create a face shape.<br>Design purposeful, functional, appealing products for themselves and other users based on design criteria in the context of using a design criteria to design a fabric face |

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| | | • How to create their own fabric face | | Generate, develop, model and communicate their ideas through talking, drawing and templates in the context of generating and communicating ideas for a fabric face.<br>Select from and use a wide range of materials including textiles according to their characteristics in the context of selecting fabrics and materials to match their faces and join together successfully.<br>Select from and use a range of tools and equipment to perform practical tasks (for example cutting, shaping, joining and finishing) in the context of using tools to make a fabric face. |
| **Year 2** | **Sensational Salads**<br><br>**FOOD** | • How to peel, zest and cut safely<br>• About healthy eating and where their food comes from<br>• Practical ideas about ingredients<br>• How to make interesting and healthy salads | root, vegetable, fruit, salad, cut, slice, blend hygiene, smell, grate, zest, juice, evaluate, taste, texture, appearance, peel oil | Understand where food comes from in the context of looking at different fruits and vegetables.<br>To explore and evaluate a range of existing products in the context of tasting salads made mainly from root vegetables. To use the basic principles of a healthy and varied diet to prepare dishes.<br>Use the basic principles of a healthy and varied diet to prepare dishes in the context of preparing a salad made from root vegetables.<br>To understand where food comes from in the context of the fish we eat<br>Use the basic principles of a healthy and varied diet to prepare dishes in the context of preparing fish salads<br>Select from and use a range of tools and equipment to perform practical tasks<br>Select from and use a range of tools and equipment to perform practical tasks in the context of preparing fruit salads. Understand where food comes from |
| | **Fabric Bunting**<br><br>**TEXTILES** | • How to evaluate a range of existing bunting<br>• How to use different to join and decorate, e.g. sewing, stapling and gluing.<br>• How to evaluate their product<br>• How to use a graphics program to create a design and template | bunting, thread, needle, properties, stitch, template, evaluate, felt, seam, design, fabric, computer, pin, program, join, product, sew | Explore and evaluate a range of existing products in the context of evaluating bunting designs.<br>Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology in the context of using a basic graphics program to design a bunting flag<br>Select from and use a range of tools and equipment to perform practical tasks (for example, cutting, shaping and finishing) in the context of cutting a template and using it to shape a piece of fabric<br>Select from and use a range of tools and equipment to perform practical tasks (for example joining) in the context of using running stitch to join fabric.<br>Select from and use a wide range of materials and components, including textiles, according to their characteristics in the context of selecting materials to join to fabric bunting<br>Select from and use a wide range of tools and equipment to perform practical tasks (for example joining and finishing) in the context of joining fabrics using different techniques.<br>Evaluate their ideas and products against a design criteria in the context of evaluating the bunting flag. |
| | **Wheels & Axles**<br><br>**MECHANISMS** | • How to make different mechanisms, e.g. levers, wheels and sliders<br>• How to sketch a design based on their own<br>• Create their own mode of | wheel, axle, chassis, washer, frame, thread, hole, straw, cotton bud, wooden dowel, attach | Explore and evaluate a range of existing products in the context of exploring existing vehicles<br>Explore and use mechanisms (for example sliders), in their products in the context of using a slider to make a vehicle.<br>Explore and use mechanisms (for example levers) in their products in the context of using a lever to make a vehicle move.<br>Design purposeful, functional and appealing products for themselves and other users based on design criteria in the context of designing an appealing vehicle.<br>Generate, develop, model and communicate their ideas through talking, drawing, templates and mock-ups in the context of drawing an annotated sketch to show their ideas about a vehicle.<br>Explore and use mechanisms (for example levers, sliders, wheels and axles) in their products in the context of making vehicle.<br>Evaluate their ideas against design criteria in the context of evaluating a vehicle |

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| | | transport with wheels & axels | | |

# KEY STAGE 2

## NC Statutory Programme of Study KS2

### 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].

When designing and making, pupils should be taught to:

**Design**

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

**Make**

- select from and use a wider range of tools and equipment to perform practical tasks [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

### 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

**Evaluate**

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

**Technical knowledge**

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products [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]
- apply their understanding of computing to program, monitor and control their products.

| | Unit being taught… | Pupils will be learning… | Vocabulary… | Knowledge, Skills and Understanding… |
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| **Year 3** | **Battery Operated Light**<br><br>**ELECTRICAL SYSTEMS** | • About series and parallel circuits and different types of switches<br>• How to design and make a battery operated light controlled by a switch<br>• How to create their own design criteria<br>• How to evaluate their final product in detail | bulb, battery, STEM, inventors, mains, electrical system, series circuit, parallel, switch, lamp, insulator, conductor, component, circuit, symbol, functional, design, evaluate, cross-sectional, annotate | Understand how key events and individuals in design and technology have helped shape the world in the context of looking at technological developments in the way we light our homes<br>Understand and use electrical systems in their products (for example, series circuits, incorporating switches, and bulbs) in the context of understanding how a series and parallel circuit can be used to light a bulb.<br>Understand and use electrical systems in their products (for example, incorporating switches) in the context of understanding how switches can be made and used in circuits.<br>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 in the context of developing design criteria for a light.<br>Generate, develop, model and communicate their ideas through annotated sketches and cross sectional in the context of sketching a design for a light.<br>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 in the context of choosing materials and components to make the main structure of the light.<br>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 in the context of selecting materials and components which will create a well finished light.<br>Evaluate their ideas and products against design criteria and consider the views of others to improve their work in the context of evaluating a battery-operated light. |

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| | **Edible Garden**<br><br>**FOOD** | • Where and how a variety of ingredients are grown<br>• How to plants seeds and care for plants<br>• How to cook with their produce<br>• To follow recipes and use kitchen equipment<br>• About safety and hygiene rules | thyme, mint, parsley, tarragon, rosemary, vitamins, seeds, basil, simmer, boil, minerals, nutrition, seasoning, calyx, measure, sow, pollinate, seasonality, millilitre, litre | Understand seasonality and know where and how a variety of ingredients are grown in the context of where and how herbs are grown<br>Understand and apply the principles of a healthy and varied diet in the context of making a balanced meal made from herbs. Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques in the context of cooking a pesto and pasta dish.<br>Understand seasonality and know where and how a variety of ingredients are grown in the context of where and how strawberries are grown<br>Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques in the context of making a strawberry smoothie.<br>Select from and use a wider range of tools and equipment to perform practical tasks accurately in the context of kitchen tools.<br>Understand seasonality, and know where and how a variety of ingredients are grown in the context of growing tomatoes.<br>Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques in the context of cooking a dish made with tomatoes. |
| | **Let's Go Fly a Kite**<br><br>**STRUCTURES** | • How to strengthen and stiffen frame structures<br>• About parts of shape of kites<br>• How to design and make their own kites<br>• How to test and evaluate their kites against design criteria | Analyse, sail, rokkaku, join, bridle, sled, kite, line, fly, design criteria, stiffen, tow point, diamond, structure, test, spars, delta, frame, tail | Understand how key events and individuals in design and technology have helped shape the world in the context of how kites have helped shape the world<br>Investigate and analyse a range of existing products in the context of investigating the different parts of a kite and their functions.<br>Investigate and analyse a range of existing products in the context of investigating the different shapes of kites<br>Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities in the context of selecting materials and components to make kite shapes out of.<br>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 in the context of developing design criteria for a kite.<br>Generate, develop, model and communicate their ideas through annotated sketches in the context of sketching a design for a kite.<br>Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately in the context of measuring and cutting the body of the kite.<br>Apply their understanding of how to strengthen, stiffen and reinforce more complex structures in the context of strengthening a frame structure to support the kite<br>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work in the context of testing the kite and then using their own design criteria to evaluate it. |
| **Year 4** | **Mechanical Posters**<br><br>**MECHANISM** | • How to make different types of levers and linkage mechanisms<br>• How to sketch a design based on their ideas<br>• How to make a prototype<br>• How to create their own 'Lever and Linkage Poster' using the context of recycling<br>• How to evaluate their product | design, brief, recycling, poster, lever, linkage, loose, prototype, input, output, sketch, fixed, annotate, pivot, adapt, mechanical system, criteria, generate, mock-up, evaluate | Investigate and analyse a range of existing products, in the context of investigating existing lever and linkage mechanisms<br>Understand and use mechanical systems in their products (for example levers and linkages), in the context of making a mechanism which uses levers and linkages.<br>Use research and develop design criteria to inform the design of innovative, functional and appealing products that are fit for purpose, aimed at individuals or groups, in the context of developing design criteria and design ideas for a moving poster to promote recycling.<br>Generate, develop, model and communicate ideas through discussion, annotated sketches, and prototypes, in the context of generating and developing ideas to make a moving poster.<br>Generate, develop, model and communicate ideas through discussion, annotated sketches, and prototypes, in the context of using the moving poster design to create a prototype.<br>Select from and use a wider range of tools and equipment to perform practical tasks accurately, in the context of selecting and using the correct tools and equipment make a moving poster<br>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, in the context of selecting materials to produce a high-quality finish on a moving poster |

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| | | | | Understand and use mechanical systems in their products (for example levers and linkages), in the context of knowing the name and function of the parts of a lever and linkage system.<br>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work, in the context of evaluating their moving poster. |
| | **The Great Bread Bake Off**<br><br>**FOOD** | • About the history of bread production<br>• How to evaluate existing bread products<br>• How to create design criteria<br>• Various skills, techniques and kitchen tools, measuring equipment<br>• How to knead dough and the technique of proving bread | brand, rise, texture, appearance, ingredients, knead, prove, product, criteria, dough, yeast, shape, design, flour, research, evaluate, taste, flavour | Understand how key events and individuals in design and technology have helped shape the world in the context of the history behind Warburtons.<br>Investigate and analyse a range of existing products in the context of different breads made by Warburtons<br>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 in the context of creating a design criteria for a new type of bread. Select from and use a wider range of tools and equipment to perform practical tasks for example shaping accurately in the context of shaping salt dough<br>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.<br>Generate, develop, model and communicate their ideas through discussion and annotated sketches in the context of creating initial designs for a new bread product<br>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.<br>Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques in the context of making a new bread product.<br>Select from and use a wider range of equipment to perform practical tasks accurately.<br>Evaluate their ideas and products against their own Design Criteria |
| | **Juggling Balls**<br><br>**TEXILES** | • How to evaluate different juggling balls<br>• How to use a hemming and overcast stitch<br>• About decoration techniques<br>• How to use tie-dye and fabric paints<br>• Design and make their own juggling ball<br>• Evaluate their product against design criteria | aesthetic, prototype, decorate, template, functional stitch, technique, design, user, analysis, product, brief, annotate, shape, hem, join, tie-dye, explore | To investigate and evaluate a range of existing products in the context of a product analysis of existing juggling balls.<br>To acquire a broad range of subject knowledge and draw upon disciplines such as mathematics in the context of using graphs to analyse existing juggling balls.<br>To generate, develop, model and communicate ideas through discussion and annotated sketches in the context of designing a circus themed juggling ball.<br>To select from and use a range of tools and equipment to perform practical tasks accurately in the context of creating a tie-dye background for a juggling ball.<br>To select from and use a wider range of materials and components according to their functional properties in the context of choosing the filling for their juggling balls.<br>Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting and shaping), accurately in the context of cutting, shaping and hemming a juggling ball.<br>To select from and use a wider range of materials and components, including textiles according to their functional properties and aesthetic qualities in the context of using a functional method for decorating a fabric.<br>To select from and use a wider range of tools and equipment to perform practical tasks (for examples shaping and joining), accurately in the context of shaping and joining a juggling ball.<br>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work in the context of evaluating juggling balls. |
| **Year 5** | **Automata Animals**<br><br>**MECHANISMS (CAMS)** | • How to control movement with a **cam** mechanism<br>• Research ideas to incorporate into design criteria and design<br>• How make a simple cam mechanism | cam, follower, linear motion, rotary motion, mechanical systems, automata, animals, endangered, mechanism, components, guide, square section, dowel, cut, axle, | 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 in the context of researching animals that will be used in their mechanical models.<br>Understand and use mechanical systems in their products (for example cams) in the context of understanding how cams can be used to make a model move.<br>Understand and use mechanical systems in their products (for example cams) in the context of understanding how changing the shape of the cam changes the movement of the follower.<br>Select from and use a wider range materials and components, including construction materials according to their functional properties and aesthetic qualities in the context of selecting materials to make a simple cam mechanism. |

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| | | • Develop techniques such as cutting, shaping and joining<br>• About the characteristics of materials and components<br>• How to peer assess designs and final product<br>• | corner joints, framework, measure, finish, peer evaluation | Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at individuals or groups in the context of developing design criteria for the Automata Animals<br>Select from and use a wider range of tools and equipment to perform practical tasks (for example cutting, shaping, joining and finishing), accurately in the context of using tools and equipment to perform the job of cutting, joining and finishing wood to make a frame.<br>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work in the context of evaluating the product design.<br>Understand and use mechanical systems in their products in the context of using a cam mechanism to make a model of an animal move. |
| | **Marbulous Structures**<br><br>**STRUCTURES** | • How to strengthen and reinforce more complex structures<br>• How to join and shape materials<br>• How to use an iterative design process, create a marble run<br>• How to test and evaluate their marble run against design criteria | support, stiffen sturdy, stable, strengthen, reinforce, structure, free standing, functional join, aesthetics, shape, cut, accurately, marble, bend, marble run, iterative design, test evaluate | To investigate and analyse a range of existing products in the context of looking at existing free-standing structures.<br>To apply their understanding of how to strengthen, stiffen and reinforce more complex structures in the context of strengthening, reinforcing and stabilising a cardboard tube.<br>To select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately in the context of joining cardboard tubes accurately together<br>To select from and use a wider range of tools and equipment to perform practical tasks (for example cutting, shaping, joining and finishing), accurately in the context of developing practical skills to help make bends in marble runs.<br>To investigate and analyse a range of existing products in the context of investigating commercially bought marble runs<br>To select from and use a wider range of materials and components according to their functional properties and aesthetic qualities in the context of selecting and using materials and components to make a marble run<br>To evaluate their ideas against their own design criteria and consider the views of others to improve their work in the context of evaluating their marble run against the design criteria set in lesson 5. |
| | **Super Seasonal Cooking**<br><br>**FOOD** | • The importance of buying seasonal food<br>• Where, when and how ingredients are grown, reared, caught and processed<br>• How to design a balances seasonal meal<br>• How to cook with seasonal ingredients following their own recipes<br>• How to use a wide range of preparation and cooking techniques<br>• How to evaluate their product against their design criteria | criteria, proportion, protein, texture, appearance, sustainable, reared, taste, specification, blanch, seasonal, griddle, processed, ride, refine, caught, spring, summer, autumn, winter | Understand seasonality in the context of when fruit and vegetables are in season in Britain<br>Understand seasonality and know where and how a variety of ingredients are reared caught and processed in the context of where food is reared, caught and processed in the United Kingdom<br>To understand seasonality in the context of tasting food that is in season.<br>Understand and apply the principles of a healthy and varied diet in the context of the importance of protein in the diet.<br>Select from a wider range of ingredients, according to their functional properties and aesthetic qualities in the context of selecting ingredients for a seasonal meal.<br>Consider the views of others to improve their work in the context of improving their design for a seasonal meal.<br>Generate, develop, model and communicate their ideas through discussion and annotated sketches in the context of designing a healthy seasonal meal.<br>Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques in the context of preparing and cooking a healthy seasonal meal.<br>Evaluate their products against their own design criteria in the context of evaluating their seasonal meal |

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| | | • About hygiene rules and handling meat and fish and safe preparation skills | | |
| Year 6 | **Felt Phone Cases**<br><br>**TEXTILES** | • How to write their own design criteria<br>• How to design for a specific user considering aesthetics and functionality<br>• How to draw annotated designs and step by step plans, and how to communicate ideas<br>• How to make paper templates<br>• How to use running stitch, backstitch, whip stitch and blanket stitch<br>• How to write a detailed evaluation | felt, scale, template, prototype, accurately, millimetre, fastening, functional, measurement, blanket stitch, aesthetics, criteria, specification, design, annotate, seam allowance, cutting line, sewing line | To 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 in the context of creating a design criteria for a mobile phone case.<br>To generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams in the context of making a paper template for a mobile phone case.<br>To generate, develop and communicate their ideas through discussion, prototypes and pattern pieces in the context of making a paper template for a mobile phone case.<br>To generate, develop, model and communicate their ideas through prototypes in the context of practising different stitches to inform the final design.<br>To generate, develop, model and communicate their ideas through discussion and annotated sketches in the context of creating a step by step plan to communicate the making process.<br>To select from and use a wider range of materials and components, including textiles, according to their functional properties and aesthetic qualities in the context of selecting decorative techniques and fastenings for felt phone cases<br>To evaluate their ideas and products against their own design criteria in the context of evaluating a felt phone case against a design criteria created. |
| | **Global Food**<br><br>**FOOD** | • About exciting and diverse food around the world<br>• Where in the world ingredients flourish<br>• More about the Eatwell place – categorising foods into groups<br>• Some basic and advanced techniques<br>• How to make some traditional dishes from different countries | global, food, ingredients, sensory, eatwell protein, carbohydrate, rice, boil, hob, recipe, nutrition, skills, techniques, peel, grate, fry, hygiene, equipment, cook | Understand seasonality, and know where and how a variety of ingredients are grown in the context of looking at where a variety of ingredients come from.<br>Understand and apply the principles of a healthy and varied diet in the context of understanding how diets are varied around the world but still consist of the same food groups.<br>Understand and apply the principles of a healthy and varied diet in the context of understanding the nutritional benefits of eating rice.<br>Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques in the context of preparing and cooking Mexican food.<br>Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques in the context of cooking Chinese food.<br>Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques in the context of cooking pretzels. |
| | **Programming Adventures**<br><br>**CAD & STRUCTURES +** | • How to program a floor robot<br>• How to explore existing adventure maps and create original designs | input, output, adventure map, materials, obstacles, go, backward, forward, turn left, turn right, | Apply their understanding of computing to program, monitor and control their products by understanding what floor robots are, how they are programmed and controlled.<br>Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams prototypes, pattern pieces and computer-aided by designing an adventure map. |

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| | | • How to create obstacles using various skills and knowledge developed through the DT curriculum, e.g. structures, mechanisms, textiles, electrical systems<br>• How to use CAD to design their adventure map (e.g. Tinkercard)<br>• How to use appropriate joining methods to make a scale adventure map<br>• How to test and evaluate other's obstacles | pause, clear, start, finish, floor robot, glue, sticky tape, stapler | 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 by exploring how different materials affect the movement and control of floor robots.<br>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 by planning an adventure map.<br>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 by creating an adventure map using materials selected for their properties.<br>Apply their understanding of computing to program, monitor and control their products by programming and monitoring floor robots on finalised adventure map.<br>Use computer added design to plan a treasure map. |

# Curriculum Expectations and Guidance
## What pupils should know, be able to do and understand

| | Years 1 and 2 | Years 3 and 4 | Years 5 and 6 |
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| DESIGN | **KS1 Design and Technology National Curriculum**<br>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.<br><br>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].<br><br>Children design purposeful, functional, appealing products for themselves and other users based on design criteria.<br><br>They generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.<br><br>Children can:<br>a use their knowledge of existing products and their own experience to help generate their ideas;<br>b design products that have a purpose and are aimed at an intended user;<br>c explain how their products will look and work through talking and simple annotated drawings;<br>d design models using simple computing software;<br>e plan and test ideas using templates and mock-ups;<br>f understand and follow simple design criteria;<br>g work in a range of relevant contexts, for example imaginary, story-based, home, school and the wider environment. | **KS2 Design and Technology National Curriculum**<br>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.<br><br>They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].<br><br>Children 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.<br><br>They generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer- aided design.<br><br>Children can:<br>a identify the design features of their products that will appeal to intended customers;<br>b use their knowledge of a broad range of existing products to help generate their ideas;<br>c design innovative and appealing products that have a clear purpose and are aimed at a specific user;<br>d explain how particular parts of their products work;<br>e use annotated sketches and cross-sectional drawings to develop and communicate their ideas;<br>f when designing, explore different initial ideas before coming up with a final design;<br>g when planning, start to explain their choice of materials and components including function and aesthetics;<br>h test ideas out through using prototypes;<br>i use computer-aided design to develop and communicate their ideas (see note on p. 1);<br>j develop and follow simple design criteria;<br>k work in a broader range of relevant contexts, for example entertainment, the home, school, leisure, food industry and the wider environment. | **KS2 Design and Technology National Curriculum**<br>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.<br><br>They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].<br><br>Children 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.<br><br>They generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.<br><br>Children can:<br>a use research to inform and develop detailed design criteria to inform the design of innovative, functional and appealing products that are fit for purpose and aimed at a target market;<br>b use their knowledge of a broad range of existing products to help generate their ideas;<br>c design products that have a clear purpose and indicate the design features of their products that will appeal to the intended user;<br>d explain how particular parts of their products work;<br>e use annotated sketches, cross-sectional drawings and exploded diagrams (possibly including computer-aided design) to develop and communicate their ideas;<br>f generate a range of design ideas and clearly communicate final designs;<br>g consider the availability and costings of resources when planning out designs;<br>h work in a broad range of relevant contexts, for example conservation, the home, school, leisure, culture, enterprise, industry and the wider environment. |

| MAKE | KS1 Design and Technology National Curriculum | KS2 Design and Technology National Curriculum | KS2 Design and Technology National Curriculum |
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| | 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 making.<br><br>Children select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing].<br><br>They select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.<br><br>Children can:<br>Planning<br>a with support, follow a simple plan or recipe;<br>b begin to select from a range of hand tools and equipment, such as scissors, graters, zesters, safe knives, juicer;<br>c select from a range of materials, textiles and components according to their characteristics;<br>Practical skills and techniques<br>d learn to use hand tools and kitchen equipment safely and appropriately and learn to follow hygiene procedures;<br>e use a range of materials and components, including textiles and food ingredients;<br>f with help, measure and mark out;<br>g cut, shape and score materials with some accuracy;<br>h assemble, join and combine materials, components or ingredients;<br>i demonstrate how to cut, shape and join fabric to make a simple product;<br>j manipulate fabrics in simple ways to create the desired effect;<br>k use a basic running stich;<br>l cut, peel and grate ingredients, including measuring and weighing ingredients using measuring cups;<br>m begin to use simple finishing techniques to improve the appearance of their product, such as adding simple decorations. | 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 making.<br><br>Children select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] accurately.<br><br>They 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.<br><br>Children can:<br>Plan<br>a with growing confidence, carefully select from a range of tools and equipment, explaining their choices;<br>b select from a range of materials and components according to their functional properties and aesthetic qualities;<br>c place the main stages of making in a systematic order;<br>Practical skills and techniques<br>d learn to use a range of tools and equipment safely, appropriately and accurately and learn to follow hygiene procedures;<br>e use a wider range of materials and components, including construction materials and kits, textiles and mechanical and electrical components;<br>f with growing independence, measure and mark out to the nearest cm and millimetre;<br>g cut, shape and score materials with some degree of accuracy;<br>h assemble, join and combine material and components with some degree of accuracy;<br>i demonstrate how to measure, cut, shape and join fabric with some accuracy to make a simple product;<br>j join textiles with an appropriate sewing technique;<br>k begin to select and use different and appropriate finishing techniques to improve the appearance of a product such as hemming, tie-dye, fabric paints and digital graphics. | 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 making.<br><br>Children select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.<br><br>They 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.<br><br>Children can:<br>Planning<br>a independently plan by suggesting what to do next;<br>b with growing confidence, select from a wide range of tools and equipment, explaining their choices;<br>c select from a range of materials and components according to their functional properties and aesthetic qualities;<br>d create step-by-step plans as a guide to making;<br>Practical skills and techniques<br>e learn to use a range of tools and equipment safely and appropriately and learn to follow hygiene procedures;<br>f independently take exact measurements and mark out, to within 1 millimetre;<br>g use a full range of materials and components, including construction materials and kits, textiles, and mechanical components;<br>h cut a range of materials with precision and accuracy;<br>i shape and score materials with precision and accuracy;<br>j assemble, join and combine materials and components with accuracy;<br>k demonstrate how to measure, make a seam allowance, tape, pin, cut, shape and join fabric with precision to make a more complex product;<br>l join textiles using a greater variety of stitches, such as backstitch, whip stitch, blanket stitch;<br>m refine the finish using techniques to improve the appearance of their product, such as sanding or a more precise scissor cut after roughly cutting out a shape. |

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| EVALUATE | **KS1 Design and Technology National Curriculum**<br>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.<br><br>Children explore and evaluate a range of existing products. They evaluate their ideas and products against design criteria. Children can:<br>a explore and evaluate existing products mainly through discussions, comparisons and simple written evaluations;<br>b explain positives and things to improve for existing products;<br>c explore what materials products are made from;<br>d talk about their design ideas and what they are making;<br>e as they work, start to identify strengths and possible changes they might make to refine their existing design;<br>f evaluate their products and ideas against their simple design criteria;<br>g start to understand that the iterative process sometimes involves repeating different stages of the process. | **KS2 Design and Technology National Curriculum**<br>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.<br><br>Children investigate and analyse a range of existing products.<br><br>They evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.<br><br>They understand how key events and individuals in design and technology have helped shape the world.<br><br>Children can:<br>a explore and evaluate existing products, explaining the purpose of the product and whether it is designed well to meet the intended purpose;<br>b explore what materials/ingredients products are made from and suggest reasons for this;<br>c consider their design criteria as they make progress and are willing to alter their plans, sometimes considering the views of others if this helps them to improve their product;<br>d evaluate their product against their original design criteria;<br>e evaluate the key events, including technological developments, and designs of individuals in design and technology that have helped shape the world. | **KS2 Design and Technology National Curriculum**<br>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.<br><br>Children investigate and analyse a range of existing products.<br><br>They evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.<br><br>They understand how key events and individuals in design and technology have helped shape the world.<br><br>Children can:<br>a complete detailed competitor analysis of other products on the market;<br>b critically evaluate the quality of design, manufacture and fitness for purpose of products as they design and make;<br>c evaluate their ideas and products against the original design criteria, making changes as needed. |
| TECHNICAL KNOWLEDGE | **KS1 Design and Technology National Curriculum**<br>Children build structures, exploring how they can be made stronger, stiffer and more stable.<br><br>They explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.<br><br>Children can:<br>a build simple structures, exploring how they can be made stronger, stiffer and more stable;<br>b talk about and start to understand the simple working characteristics of materials and components;<br>c explore and create products using mechanisms, such as levers, sliders and wheels. | **KS2 Design and Technology National Curriculum**<br>Children apply their understanding of how to strengthen, stiffen and reinforce more complex structures.<br><br>They understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].<br><br>They understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].<br><br>They apply their understanding of computing to program, monitor and control their products.<br><br>Children can:<br>a understand that materials have both functional properties and aesthetic qualities;<br>b apply their understanding of how to strengthen, stiffen and reinforce more complex structures in order to create more useful characteristics of products; | **KS2 Design and Technology National Curriculum**<br>Children apply their understanding of how to strengthen, stiffen and reinforce more complex structures.<br><br>They understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].<br><br>They understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].<br><br>They apply their understanding of computing to program, monitor and control their products.<br><br>Children can:<br>a apply their understanding of how to strengthen, stiffen and reinforce more complex structures in order to create more useful characteristics of products;<br>b understand and demonstrate that mechanical and electrical systems have an input, process and output;<br>c explain how mechanical systems, such as cams, create |

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| | | c understand and demonstrate how mechanical and electrical systems have an input and output process;<br>d make and represent simple electrical circuits, such as a series and parallel, and components to create functional products;<br>e explain how mechanical systems such as levers and linkages create movement;<br>f use mechanical systems in their products. | movement and use mechanical systems in their products;<br>d apply their understanding of computing to program, monitor and control a product. |
| COOKING AND NUTRITION | **KS1 Design and Technology National Curriculum**<br>Children use the basic principles of a healthy and varied diet to prepare dishes.<br>They understand where food comes<br>from. Children can:<br>a explain where in the world different foods originate from;<br>b understand that all food comes from plants or animals;<br>c understand that food has to be farmed, grown elsewhere (e.g. home) or caught;<br>d name and sort foods into the five groups in the Eatwell Guide;<br>e understand that everyone should eat at least five portions of fruit and vegetables every day and start to explain why;<br>f use what they know about the Eatwell Guide to design and prepare dishes. | **KS2 Design and Technology National Curriculum**<br>Children understand and apply the principles of a healthy and varied diet.<br>They prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.<br>They understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.<br>Children can:<br>a start to know when, where and how food is grown (such as herbs, tomatoes and strawberries) in the UK, Europe and the wider world;<br>b understand how to prepare and cook a variety of predominantly savoury dishes safely and hygienically;<br>c with support, use a heat source to cook ingredients showing awareness of the need to control the temperature of the hob and/or oven;<br>d use a range of techniques such as mashing, whisking, crushing, grating, cutting, kneading and baking;<br>e explain that a healthy diet is made up of a variety and balance of different food and drink, as represented in the Eatwell Guide and be able to apply these principles when planning and cooking dishes;<br>f understand that to be active and healthy, nutritious food and drink are needed to provide energy for the body;<br>g prepare ingredients using appropriate cooking utensils;<br>h measure and weigh ingredients to the nearest gram and millilitre;<br>i start to independently follow a recipe;<br>j start to understand seasonality. | **KS2 Design and Technology National Curriculum**<br>Children understand and apply the principles of a healthy and varied diet.<br>They prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.<br>They understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.<br>Children can:<br>a know, explain and give examples of food that is grown (such as pears, wheat and potatoes), reared (such as poultry and cattle) and caught (such as fish) in the UK, Europe and the wider world;<br>b understand about seasonality, how this may affect the food availability and plan recipes according to seasonality;<br>c understand that food is processed into ingredients that can be eaten or used in cooking;<br>d demonstrate how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source;<br>e demonstrate how to use a range of cooking techniques, such as griddling, grilling, frying and boiling;<br>f explain that foods contain different substances, such as protein, that are needed for health and be able to apply these principles when planning and preparing dishes;<br>g adapt and refine recipes by adding or substituting one or more ingredients to change the appearance, taste, texture and aroma;<br>h alter methods, cooking times and/or temperatures;<br>i measure accurately and calculate ratios of ingredients to scale up or down from a recipe;<br>j independently follow a recipe. |

# Additional Cultural Capital Opportunities

| General | DT assemblies | | | | | |
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| **Reception** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| | | Brooklands Transport Museum | | Trip to Pizza Express | Whitgift Project<br><br>STEM Fair at Riddlesdown School<br><br>Trinity Workshops | |