| Skill taught and Curriculum link | | Application of Skills and Knowledge | | | |
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| | | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Project/Aim** | | 1. **Christmas packaging** <br> 2. **Smoothie** <br> 3. **Nightlight** | 1. **Money containers** <br> 2. **Savoury Muffins** <br> 3. **Pop-up book** | 1. **Shelters** <br> 2. **Biscuits** <br> 3. **Alarms** | 1. **Slippers** <br> 2. **Hot Cross Buns** <br> 3. **Fairground Ride** |
| **Design** <br><br> - 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, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design | **Skill** | • Design a package for a purpose aimed at a particular group of their choosing, considering font, colour, size <br> • Joining techniques for 3D packages and models e.g. tabs <br> • Children to consider the main stages in making and testing before assembling high quality products | • Design a money collectors and design pattern according to target market. <br> • Design a savoury muffin using rationed ingredients. <br> • Design a pop-up book. <br><br> • Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user. <br><br> • Use annotated sketches and prototypes to develop, model and communicate ideas. | • Use research to develop a design specification for a functional product that responds automatically to changes in the environment. <br> • Take account of constraints including time, resources and cost. <br> • Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams <br> • Designing a flapjack for a purpose – who is it for, how will it appeal to its target audience ect. <br> • Reviewing and investigating existing products (flapjacks, alarm systems, shelters) to enable them to design their own <br> • How to draw cross sections (Bake Off Style!) of their flapjacks to show the internal view of their flapjack <br> • Creating prototypes | • Investigate manufacture of slippers and methods of construction used (glue, sewing) <br> • Generate innovative designs <br> • Generate questionnaire to inform design <br> • Measuring parts of foot and combining into design <br> • Communicate ideas through labelled drawings <br> • Investigation of types of slippers, purpose, target audience and materials used. <br> • Investigate fairground rides and how movement is produced. <br> • Tasting Hot cross buns and investigating yeast |
| | **Knowledge & Vocabulary** | • Understanding of 2D nets and 3D shapes <br> • Measurement and units of measure <br> • Know the names and flavours of different fruit <br> • Understand of how electricity travels | • Know what a target market is. <br> • Know how to interview. <br> • Know how to sample previous products. | • Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. <br> • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment. <br> • What different audiences look for in a product and how can the children meet the needs of their audience <br> • Why pre-existing products have certain elements/features that the children can incorporate <br> • Understanding when it is appropriate to draw a cross-section (when what is on the inside is important) <br> • Reflecting on the importance of prototypes for **any** product | • Creating template for material <br> • Creating a design drawing and model of slipper <br> • Create a recipe for Hot Cross buns <br> • Create a plan for a model fairground driven by a motorised pulley system with a labelled drawing |

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| | | | | • Using knowledge of our topic in English to think about what cultural and structural existing examples they have seen – how have they considered these<br>• What structures are and how they can be made stronger, stiffer and more stable.<br>• Know famous inventors who developed ground-breaking electrical systems and components.<br>• Research key events and individuals relevant to frame structures. | |
| **Make**<br>- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately<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 | Skill | • Create a prototype using measured squared paper of their design<br>• Building and constructing 3D containers using and connecting tabs to secure their structure made from card<br>• Cutting fruit using knives and food shape-cutters into shapes and pieces they have designed<br>• Using blenders to blend and liquefy fruits<br>• Circuits construction | 1. Savoury Muffins – cooking using cookery equipment and specific measures.<br>2. Money container – make wallet using a variety of materials and practice skill of sewing.<br>3. Pop-up Book – make a targeted pop-up relevant to their selected story (becoming paper engineers).<br><br>• Plan the main stages of making.<br>• Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing.<br>• Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.<br>• Select from and use appropriate tools with some accuracy to cut, shape and join paper and card.<br>• Select from and use finishing techniques suitable for the product they are creating. | • Using appropriate ingredients for a flapjack and understanding how to make flapjacks efficiently and effectively in the classroom environment.<br>• Construction materials and how they could find an appropriate alternative to use in the classroom<br>• Using equipment which requires a high level of safety – microwave, saw, scissors | • Construct a pair of slippers that fit<br>• Create a detailed list of tools and materials<br>• Assemble a working fairground model driven by electric pulley system<br>• Bake a tray of Hot Cross buns following a recipe |
| | Knowledge & Vocabulary | • Opaque, translucent, transparent elements of their structure | • Know how to use certain equipment (and safely).<br>• Know what ingredients work in a wet dough.<br>• Know how to thread a needle.<br>• Know how to un-pick thread.<br>• Know how to tie a knot.<br>• Know which stitch to use.<br>• Know how to fold paper to form a desired shape.<br>• Know how to lay out pages effectively (writing, pictures and pop-up) | • Continually evaluate and modify the working features of the product to match the initial design specification.<br>• How to use kitchen utensils and equipment safely<br>• Most effective and efficient ways of joining materials for their shelters – considering how this would work outside and precautions which would need to take place.<br>• Shaped frames – what and why? | • To select the correct stitch for joining and decorating<br>• Selecting appropriate materials for task<br>• Create a switch that will stop and possibly change movement<br>• Use knowledge of yeast for effective proving<br>• Work hygienically to avoid germs |
| **Evaluate** | Skill | • Evaluate their packaging- is it fit for purpose? Is it similar to their initial | • Evaluate WWW and EBI | • Critically evaluate their products against their design specification, | • Evaluate material used in slipper making |

| | | design, did they need to make changes? Why?<br>• Fruit smoothie testing – self evaluated taste test against their design criteria. Evaluate aesthetics, taste and design. | • Children to compare and contrast with peers.<br>• Taste tests and taste diagram.<br>• Colouring in relevant statements, which apply to their product.<br>• Evaluate their own products and ideas against criteria and user needs, as they design and make. | intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.<br>• Reviewing their own products against existing products<br>• Giving feedback to others in the class against the criteria to enable children to receive/give instant feedback for improvements and reflections. | • Evaluate different Hot Cross buns for taste<br>• Evaluate how a pulley system creates a horizontal or vertical motion |
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| • Investigate and analyse a range of existing products<br>‑ Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work<br>‑ Understand how key events and individuals in design and technology have helped shape the world | Knowledge & Vocabulary | | • Learn how to be critical.<br>• Think of positively of constructive criticism.<br>• Think of changes that could improve a product for future.<br>• Analytical mind-set. | • Children to self-assess and peer assess on a range of criteria – aesthetic appeal, taste (flapjacks), effectiveness, meeting the needs of its audience<br>• Enabling to take on constructive criticism and incorporating this into future work<br>• Compared to existing products, is it successful?<br>• Research key events and individuals relevant to frame structures. | • Evaluate product against original design<br>• Evaluate functionality and fitness for purpose<br>• Ingredients suitable for use in Hot cross buns<br>• Create model pulley systems and circuits |
| **Technical Knowledge**<br>‑ Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.<br>‑ Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]<br>‑ Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]<br>‑ Apply their understanding of computing to program, monitor and control their products | Skill | • Reinforcing 3D packaging to hold contents<br>• Using different chopping/cutting methods to safely cut fruits | • Sewing<br>• Paper engineers<br>• Cooking | • Use research to develop a design specification for a functional product that responds automatically to changes in the environment.<br>• Take account of constraints including time, resources and cost.<br>• Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams<br>• Designing a flapjack for a purpose – who is it for, how will it appeal to its target audience ect.<br>• Reviewing and investigating existing products (flapjacks, alarm systems, shelters) to enable them to design their own<br>• How to draw cross sections (Bake Off Style!) of their flapjacks to show the internal view of their flapjack<br>• Creating prototypes | • Sewing a range of stitches<br>• Gluing – use of glue gun<br>• Measuring<br>• Cutting<br>• Kneading & proving in baking<br>• Materials that conduct<br>• Electrical circuit construction<br>• How to strengthen structures and materials<br>• Use of glue gun safely<br>• Using copydex glue using correct instructions to maintain strength |
| | Knowledge & Vocabulary | • Circuits and flow of electricity<br>• Children know the purpose of the battery-powered products that they will be designing and making and who they will be for.<br>• How to create a switch for their nightlight to operate their bulb | • Different types of levers.<br>• Different types of pop-ups.<br>• Different types of ingredients.<br>• Difference types of stitching and fastening.<br>• Know and use technical vocabulary relevant to the project. | • Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product.<br>• Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment.<br>• What different audiences look for in a product and how can the children meet the needs of their audience | • Working parts of pulley system and their functions<br>• Using a variety of materials to create a working switch within a circuit.<br>• Use correct glue appropriately and effectively |

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| | | | | • Why pre-existing products have certain elements/features that the children can incorporate<br>• Understanding when it is appropriate to draw a cross-section (when what is on the inside is important)<br>• Reflecting on the importance of prototypes for **any** product<br>• Using knowledge of our topic in English to think about what cultural and structural existing examples they have seen – how have they considered these<br>• what structures are and how they can be made stronger, stiffer and more stable.<br>• Know famous inventors who developed ground-breaking electrical systems and components.<br>• Research key events and individuals relevant to frame structures. | |
| **Cooking and Nutrition**<br><br>- Understand and apply the principles of a healthy and varied diet;<br>- Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques;<br>- Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. | Skill | • Design a package for a purpose aimed at a particular group of their choosing, considering font, colour, size<br>• Cutting fruit using knives and food shape-cutters into shapes and pieces they have designed<br>• Using blenders to blend and liquefy fruits<br>• Fruit salad testing – self evaluated taste test against their design criteria. Evaluate aesthetics, taste and design.<br>• Using different chopping/cutting methods to safely cut fruits | • Design a savoury muffin using rationed ingredients.<br>• Savoury Muffins – cooking using cookery equipment and specific measures.<br>• Taste tests and taste diagram. | • Designing a flapjack for a purpose – who is it for, how will it appeal to its target audience ect.<br>• Reviewing and investigating existing flapjacks products to enable them to design their own<br>• How to draw cross sections of their flapjacks to show the internal view of their flapjack<br>• Using appropriate ingredients for a flapjack and understanding how to make flapjacks efficiently and effectively in the classroom environment. | • Tasting Hot cross buns and investigating yeast<br>• Bake a tray of Hot Cross buns following a recipe<br>• Cutting<br>• Kneading & proving in baking |
| | Knowledge & Vocabulary | • name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet | • name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet | • ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble | • ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble |

| Vocabulary (General) | | user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, function, planning, design criteria, annotated sketch, appealing | evaluating, design brief design criteria, innovative, prototype, user, purpose, function, prototype, design criteria, innovative, appealing, design brief, planning, annotated sketch, sensory evaluations | design decisions, functionality, authentic, user, purpose, design specification, design brief, innovative, research, evaluate, design criteria, annotate, evaluate, mock-up, prototype | function, innovative, design specification, design brief, user, purpose design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional, mock-up, prototype |
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| Vocabulary (Structure) | | shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity, marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating, font, lettering, text, graphics, decision, | shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity, marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating, font, lettering, text, graphics, decision, | frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent | frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent |
| Vocabulary (Textiles) | | fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance | fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance | seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces, name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, | seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces, name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, |
| Vocabulary (Mechanisms and mechanical systems) | | mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output linear, rotary, oscillating, reciprocating | mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output linear, rotary, oscillating, reciprocating | pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor, circuit, switch, circuit diagram, annotated drawings, exploded diagrams, mechanical system, electrical system, input, process, output | pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor, circuit, switch, circuit diagram, annotated drawings, exploded diagrams, mechanical system, electrical system, input, process, output |
| Vocabulary (Electrical systems) | | series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip, control, program, system, input device, output device | series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip, control, program, system, input device, output device | reed switch, toggle switch, push-to-make switch, push-to-break switch, light dependent resistor (LDR), tilt switch, light emitting diode (LED), bulb, bulb holder, battery, battery holder, USB cable, wire, insulator, conductor, crocodile clip control, program, system, input device, output device, series circuit, parallel circuit | reed switch, toggle switch, push-to-make switch, push-to-break switch, light dependent resistor (LDR), tilt switch, light emitting diode (LED), bulb, bulb holder, battery, battery holder, USB cable, wire, insulator, conductor, crocodile clip control, program, system, input device, output device, series circuit, parallel circuit |

| KS1 and KS3 D&T Curriculum | KS1: Design | KS3 Design: |
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| | (start point – cultural capital) | *use research and exploration, such as the study of different cultures, to identify and understand user needs |
| | *Design purposeful, functional, appealing products for themselves and other users based on design criteria | *identify and solve their own design problems and understand how to reformulate problems given to them |
| | *Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology | *develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations |
| | | *use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses |
| | KS1 Make: | * develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools |
| | *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 | KS3: Make |
| | | *Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture |
| | KS1 Evaluate: | * select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties |
| | *explore and evaluate a range of existing products | |
| | *evaluate their ideas and products against design criteria | KS3 Evaluate |
| | | * analyse the work of past and present professionals and others to develop and broaden their understanding |
| | KS1 Technical knowledge: | *investigate new and emerging technologies |
| | * build structures, exploring how they can be made stronger, stiffer and more stable | * test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups |
| | * explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. | * understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists |
| | | KS3 Technical knowledge: |
| | | *understand and use the properties of materials and the performance of structural elements to achieve functioning solutions *understand how more advanced mechanical systems used in their products enable changes in movement and force |
| | | * 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] |
| | | * 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]. |
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