

Knebworth Primary School Design and Technology Matrix



Children will be inspired to bring to life a range of purposeful products that solve real life problems.

“Good buildings come from good people and all problems are solved by good design “

Stephen Gardiner

<i>Deep Roots</i>	Autumn Term		Key Vocabulary (in bold)
	Skills	Knowledge	
<p>Y1</p> <p>Subject link opportunities: Spoken language Mathematics Science (intro to build on in Spring term)</p>	<p>Mechanisms – making a vehicle using wheels and axles</p> <p>Explore Explore and evaluate a range of wheeled products such as toys and everyday objects.</p> <p>Draw an example of a wheeled product, stating the user and purpose, and labelling the main parts e.g. body, chassis, wheels, axles and axle holders.</p> <p>Design Generate initial ideas and simple design criteria through talking and using own experiences. Develop and communicate ideas through drawings and mock-ups.</p> <p>Select/Make</p>	<p>Mechanisms – making a vehicle using wheels and axles</p> <p>Project Question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)? Set by teacher.</p> <p>What could children design, make and evaluate? Push/pull toys e.g. emergency service vehicle, carnival float, farm vehicle, clown’s car, vehicle for imaginary/story character, shopping trolley etc.</p> <p>Knowledge and understanding:</p> <ul style="list-style-type: none"> Understand how to use wheels, axles and axle holders, using design ideas as a guide. Recognise an example of a wheeled product, stating the user and purpose, and can label the main parts e.g. body, chassis, wheels, axles and axle holders. 	<p>vehicle, wheel, axle, names of tools, equipment and materials used, design, make.</p> <p>Wider Vocab: axle holder, chassis, body, cab, assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism, evaluate, purpose, user, criteria, functional</p>

	<p>Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing.</p> <p>Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.</p> <p>Evaluate</p> <p>Explore and evaluate a range of products with wheels and axles.</p> <p>Evaluate their ideas throughout and their products against original criteria.</p>	<ul style="list-style-type: none"> • Know how to generate, develop and communicate their ideas as appropriate e.g. through talk and drawing. Talk about, evaluate and share ideas with other children/adults. • Know how to evaluate their finished product, communicating how it works and how it matches their design criteria, including any changes they made. • Know and use technical vocabulary relevant to the project. 	
<p>Y2 Subject link opportunities:</p> <p>Spoken language Science – everyday materials. Mathematics Computing</p>	<p>Mechanisms - making a product with a slider and lever</p> <p>Explore</p> <p>Children explore and evaluate a collection of books and everyday products that have moving parts, including those with levers and sliders.</p> <p>Design</p> <p>Generate ideas based on simple design criteria and their own experiences, explaining what they could make.</p> <p>Begin to consider intended audience/purpose.</p> <p>Develop, model and communicate their ideas through drawings and mock-ups with card and paper.</p> <p>Select/Make</p> <p>Plan by suggesting what to do next.</p> <p>Select and use tools, explaining their choices, to cut, shape and join paper and card.</p> <p>Use simple finishing techniques suitable for the product they are creating.</p> <p>Evaluate</p>	<p>Mechanisms - making a product with a slider and lever.</p> <p>Project Question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)? Set by teacher.</p> <p>What could children design, make and evaluate?</p> <p>Class/group storybook, poster, display, greetings card class/group information book, storyboard etc.</p> <p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Know how to use sliders and levers and understand that different mechanisms produce different types of movement. • Know how to use simple design criteria and collectively order the process in which the produce must be made • Understand how to follow modelled instructions from the teacher to create their own product. • Know how to develop their ideas through talking, drawing and making mock-ups of their ideas with paper and card. • Know and use technical vocabulary relevant to the project Introduce and develop vocabulary e.g. lever, 	<p>slider, lever, card, join, pull, push, up, down, design, make</p> <p>Wider Vocab: pivot, slot, bridge/guide , masking tape, paper fastener, straight, curve, forwards, backwards, evaluate, user, purpose, ideas, design criteria, product, function</p>

	Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.	<p>pivot, slider, left, right, push, pull, up, down, forwards, backwards, in, out.</p> <ul style="list-style-type: none"> Know how to evaluate their developing ideas and final products against the original design criteria. 	
<p>Y3</p> <p>Subject link opportunities:</p> <p>Spoken language Mathematics Computing English (writing)</p>	<p>Structures – creating a shell structure</p> <p>Explore</p> <p>Investigate a collection of different shell structures including packaging. Take a small package apart, identifying and discussing parts of a net including the tabs.</p> <p>Evaluate existing products to determine which designs children think are the most effective. Judge the suitability of the shell structures for their intended users and purposes. Discuss graphics including colours/impact of style/logo/size of font.</p> <p>Design</p> <p>Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product.</p> <p>Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas.</p> <p>Select/Make</p> <p>Order the main stages of making.</p> <p>Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy.</p> <p>Explain their choice of materials according to functional properties and aesthetic qualities.</p> <p>Use finishing techniques suitable for the product they are creating.</p> <p>Evaluate</p> <p>Investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used.</p>	<p>Structures – creating a shell structure</p> <p>Project Question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)? Set by teacher.</p> <p>What could children design, make and evaluate? gift boxes/containers, desk tidy, disposable/recyclable lunchboxes, packaging, cool boxes, party boxes, keep safe boxes, mystery boxes</p> <p>Knowledge and understanding:</p> <ul style="list-style-type: none"> Know how a shell structure functions and their use and purpose. Develop and use knowledge of how to construct strong, stiff shell structures. Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. Know how to create a shared design brief, as well as shared design criteria and able to identify the main stages and equipment needed for the tasks. Know how to use scoring, cutting out and assembling using pre-drawn nets, as well as graphics techniques and media that could be used to achieve the desired appearance of their products. Able to use annotated sketches and prototypes to develop, model and communicate their ideas for the product. Know how to evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed. 	<p>shell structure, three-dimensional (3-D) shape, net, cube, cuboid, edge, face, length, width, tabs, material , text, design, make, evaluate, design brief, design criteria</p> <p>Wider Vocab: prism, vertex, breadth, capacity, marking out, scoring, shaping, , adhesives, joining, assemble, accuracy, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating, font, lettering, , graphics, decision, innovative, prototype</p>

	Test and evaluate their own products against design criteria and the intended user and purpose	<ul style="list-style-type: none"> Know and use technical vocabulary relevant to the project. 	
<p>Y4</p> <p>Subject link opportunities:</p> <p>Spoken language Mathematics Computing</p>	<p>Mechanical Systems – creating a product featuring levers and linkages</p> <p>Explore Investigate, analyse and evaluate books and, where available, other products which have a range of lever and linkage mechanisms.</p> <p>Design Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user. Use annotated sketches and prototypes to develop, model and communicate ideas.</p> <p>Select/Make Order the main stages of making. Select from and use appropriate tools with some accuracy to cut, shape and join paper and card. Select from and use finishing techniques suitable for the product they are creating.</p> <p>Evaluate Investigate and analyse books and, where available, other products with lever and linkage mechanisms. Evaluate their own products and ideas against criteria and user needs, as they design and make.</p>	<p>Mechanical Systems – creating a product featuring Levers and Linkages</p> <p>Project Question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)? Set by teacher.</p> <p>What could children design, make and evaluate? storybook, poster, class display, greetings card, information book, storyboard.</p> <p>Knowledge and understanding</p> <ul style="list-style-type: none"> Understand and use lever and linkage mechanisms and can distinguish between fixed and loose pivots. Know how to create and use design criteria to reflect the purpose of the product and use to guide the development and evaluation of the product. Able to develop a design brief as a whole class. Can identify the main stages in making before assembling high quality products, and know to take careful consideration of who the product is for and the intended purpose when generating ideas. Understand how to use annotated sketches and prototypes to develop, model and communicate their ideas. Understand the importance of accurate use of measuring, marking out, cutting, joining and finishing skills and techniques. Know and use technical vocabulary relevant to the project 	<p>lever, linkage, pivot, slot, bridge, guide, user, purpose, function, design criteria, design brief, prototype, design, make, evaluate.</p> <p>Wider Vocab: Mechanism, system, input, process, output, linear, rotary, oscillating, reciprocating, innovative, appealing,</p>
<p>Y5</p> <p>Subject link opportunities:</p>	<p>Food Celebrating cultures and creating savoury foods</p> <p>Explore Use first hand and secondary sources to carry out relevant research into existing products to</p>	<p>Food - Celebrating cultures and creating savoury foods</p> <p>Project Question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)?</p>	<p>ingredients, fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, savoury, utensils, design</p>

<p>Spoken language Mathematics Computing English (writing)</p>	<p>include personal/cultural preferences, ensuring a healthy diet, meeting dietary needs and the availability of locally sourced/seasonal/organic ingredients.</p> <p>Able to carry out sensory evaluations of a variety of existing food products and ingredients relating to the project. Present results in e.g. tables/graphs/charts and by using evaluative writing.</p> <p>Design</p> <p>Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification.</p> <p>Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose.</p> <p>Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas.</p> <p>Select/Make</p> <p>Write a step-by-step recipe, including a list of ingredients, equipment and utensils</p> <p>Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients.</p> <p>Make, decorate and present the food product appropriately for the intended user and purpose.</p> <p>Evaluate</p> <p>Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements.</p> <p>Understand how key chefs have influenced eating habits to promote varied and healthy diets.</p>	<p>What could children design, make and evaluate?</p> <p>Bread, pizza, savoury biscuits, savoury scones, savoury muffin, cereal snack, soup.</p> <p>Technical knowledge and understanding</p> <ul style="list-style-type: none"> • Know how to safely use utensils and equipment including heat sources to prepare and cook food. • Understand about seasonality in relation to food products and the source of different food products. • Know and use relevant technical and sensory vocabulary. • Know how to develop a design brief and simple design specification to develop and evaluate their product. including design criteria relating to nutrition and healthy eating. • Able to consider the intended purpose and user carefully in the design and creation of their product. • Know how to independently record the steps, equipment, utensils and ingredients for making the food product, drawing on the knowledge, understanding and skills learnt previously. 	<p>specification, innovative, research, evaluate, design brief</p> <p>Wider Vocab: dough bran, flour, wholemeal, unleavened, baking soda, spice, herbs, yeast, varied, gluten, dairy, allergy, intolerance, source, seasonality, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble</p>
<p>Y6 Subject link opportunities:</p>	<p>Textiles –combining fabrics (pencil cases)</p> <p>Explore</p> <p>Generate ideas by carrying out research using e.g. surveys, interviews, questionnaires and the web.</p>	<p>Textiles – combining different fabrics. (pencil cases)</p> <p>Project Question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)?</p>	<p>name of textiles and fastenings used, pins, needles, thread seam, seam allowance, wadding, right side, wrong side, hem, template,</p>

<p>Spoken language Mathematics Computing</p>	<p>Investigate and analyse textile products linked to their final product.</p> <p>Design Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer-aided design. Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.</p> <p>Select/Make Produce detailed lists of equipment and fabrics relevant to their tasks. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost.</p> <p>Evaluate Compare the final product to the original design specification. Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. Consider the views of others to improve their work.</p>	<p>What could children design, make and evaluate? Tablet case, mobile phone carrier, shopping bag, insulating bag hat/cap, garden tool belt, slippers, sandals, fabric advent calendar, fabric door stop, pencil cases.</p> <p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Know how to create a 3-D textile product, which can be from a combination of accurately made pattern pieces, fabric shapes and different fabrics. • Able to communicate ideas through detailed, annotated drawings from different perspectives and/or computer- aided design. Drawings should show knowledge of design decisions made, the methods of strengthening, the type of fabrics to be used and the types of stitching that will be incorporated. • Know how to produce step-by-step plans, lists of tools equipment, fabrics and components needed. • Know how to use a range of decorating techniques to ensure a well-finished final product that matches the intended user and purpose. • Understand how computer-aided design (CAD) can be used to generate pattern pieces. • Know how to critically evaluate throughout, comparing the final product to the original design specification. 	<p>pattern pieces, design criteria, annotate, design decisions, user, purpose, research, evaluate, prototype</p> <p>Wider Vocab: reinforce, pinking shears, fastenings, iron transfer paper , functionality, innovation, authentic, , mock-up,</p>
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<i>Deep Roots</i>			
Spring Term			
	Skills	Knowledge	Key Vocabulary
<p>Y1</p> <p>Subject link opportunities:</p> <p>Spoken language Art and Design Mathematics English - fairytales</p>	<p>Food – preparing fruit and vegetables to make a healthy snack</p> <p>Explore Examine a range of fruit/vegetables, with opportunities for children to handle, smell and taste fruit and vegetables in order to describe them through talking and drawing. Evaluate existing products to determine what the children like best</p> <p>Design Design appealing products for a particular user based on simple design criteria. Generate initial ideas and design criteria through investigating a variety of fruit and vegetables. Communicate these ideas through talk and drawings.</p> <p>Select/Make Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.</p> <p>Evaluate Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. Evaluate ideas and finished products against design criteria, including intended user and purpose.</p>	<p>Food – preparing fruit and vegetables to make a healthy snack</p> <p>Project Question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)? Set by teacher.</p> <p>What could children design, make and evaluate? fruit salads, fruit yogurt, fruit drinks, fruit jelly, fruit smoothies, vegetable salads, fruit and vegetable kebabs,</p> <p>Technical knowledge and understanding</p> <ul style="list-style-type: none"> Understand where a range of fruit and vegetables come from and use basic principles of a healthy and varied diet to prepare dishes. Know about basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. <i>What should we do before we work with food? Why is following instructions important?</i> Know how to use simple utensils and begin to introduce food-processing skills such as washing, grating, peeling, slicing, squeezing Know and use technical and sensory vocabulary relevant to the project. Use talk and drawings to show they know how to plan their products. 	<p>fruit and vegetable names, sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard, design, make.</p> <p>Wider Vocab: names of equipment and utensils , flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, evaluate, criteria</p>
<p>Y2</p> <p>Subject link opportunities:</p> <p>Spoken language</p>	<p>Textiles – templates and joining to create a puppet</p> <p>Explore Explore and evaluate a range of existing textile products relevant to the project being undertaken. Explore and compare e.g. fabrics, joining techniques, finishing techniques and fastenings used.</p>	<p>Textiles - templates and joining to create a puppet</p> <p>Project Question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)? Set by teacher.</p>	<p>Design, make, template, pattern pieces, mark out, join, decorate, finish, tools</p>

<p>Art and Design – mask making Mathematics Computing English (writing)</p>	<p>Design Design a functional and appealing product for a chosen user and purpose based on simple design criteria. Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology.</p> <p>Select/Make Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. Select from and use textiles according to their characteristics.</p> <p>Evaluate Evaluate their ideas throughout and their final products against original design criteria.</p>	<p>What could children design, make and evaluate? Glove puppet, finger puppet, simple bag, clothes for teddy/soft toy/class doll, fabric placemat.</p> <p>Knowledge and understanding</p> <ul style="list-style-type: none"> Understand how simple 3-D textile products are made, using a template to create two identical shapes. Able to make drawings of existing products, stating the user and purpose. Identify and label, if appropriate, the fabrics, fastenings and techniques used. Know how to join fabrics using different techniques (e.g. running stitch, glue, over stitch, stapling.) and use different finishing techniques (e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.) Able to use design criteria, which has been developed with the teacher and know how to evaluate ongoing work and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed. Able to use talk, drawings and mock-ups, to develop and communicate their range of deas. Know and use technical vocabulary relevant to the project. 	<p>Wider Vocab: names of existing products, joining and finishing techniques, fabrics and components, features, suitable, quality mock-up, design brief, design criteria , user, purpose, function</p>
<p>Y3 Subject link opportunities: Spoken language Art and Design</p>	<p>Food- healthy and varied diet. Making a healthy lunch. Explore Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs.</p> <p>Design</p>	<p>Food – healthy and varied diet. Making a healthy lunch. Project question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)? Set by teacher. What could children design, make and evaluate?</p>	<p>Name of products, names of equipment, utensils, techniques and ingredients , hygienic, planning design, make, evaluate, design criteria, purpose, users</p>

<p>Mathematics Computing Science – teeth and digestion English (writing)</p>	<p>Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose. Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.</p> <p>Select/Make Plan the main stages of a recipe, listing ingredients, utensils and equipment. Select and use appropriate utensils and equipment to prepare and combine ingredients. Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.</p> <p>Evaluate Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.</p>	<p>sandwiches , wraps, rolls, pitta pockets, blinis, rice cakes, toasties, snack bar, salad snacks</p> <p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Know how to select and use appropriate equipment and utensils to prepare and combine food hygienically. • Know about a range of fresh and processed ingredients appropriate for their product. • Develop further knowledge of to the principles of a varied and healthy diet • Know how to develop and agree on design criteria with teacher, including criteria relating to healthy eating and a varied diet. • Know how to generate a range of ideas and use discussion, annotated sketches and information and communication technology if appropriate, to develop and communicate their ideas. • Know how to evaluate as the assignment proceeds and the final product against the intended purpose and user, reflecting on the design criteria previously agreed. • Know and use relevant technical vocabulary relevant to the project 	<p>Wider Vocab: texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet, annotated sketch, sensory evaluation</p>
<p>Y4 Subject link opportunities: Spoken language Computing Science - Electricity</p>	<p>Electrical Systems – creating a product using simple circuits and switches.</p> <p>Explore Investigate and analyse a range of existing battery-powered products</p> <p>Design Gather information about needs and wants, and develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups.</p>	<p>Electrical Systems – creating a product using simple circuits and switches</p> <p>Project question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)</p> <p>What could children design, make and evaluate? siren for a toy vehicle, reading light, noise-making toy, nightlight, illuminated sign, torches, table lamp,</p>	<p>series circuit, fault, connection, battery, battery holder, bulb, bulb user, purpose, function, design brief holder, wire, insulator, conductor, crocodile clip.</p>

	<p>Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams.</p> <p>Select/Make</p> <p>Order the main stages of making.</p> <p>Select from and use tools and equipment to cut, shape, join and finish with some accuracy.</p> <p>Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities.</p> <p>Evaluate</p> <p>Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.</p>	<p>lighting for display, hands-free head lamp , buzzer for school office.</p> <p>Knowledge and understanding</p> <ul style="list-style-type: none"> Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. Able to discuss which of the components in the circuit are input devices e.g. switches, and which are output devices e.g. bulbs and buzzers and know how to find a fault in a simple circuit and correct. Know how to develop a design brief with the teacher, which includes safety considerations. Know how to generate and critically reflect on a range of ideas, and how to consider the main stages in making and testing before assembling high quality products. Knowledge of the dangers of electricity and safety when using electricity. Understand how to evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed Know how to use a simple computer control program with an interface box or standalone control box to physically control output devices e.g. bulbs and buzzers. Know and use technical vocabulary relevant to the project. 	<p>Wider Vocab: toggle switch, push-to-make switch, push-to-break switch, control, program, system, input device, output device prototype, innovative, appealing,</p>
<p>Y5</p> <p>Subject link opportunities:</p> <p>Spoken language</p>	<p>Structures – creating a frame structure</p> <p>Explore</p> <p>Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources.</p>	<p>Structures – creating a frame structure</p> <p>Project question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)?</p> <p>What could children design, make and evaluate?</p>	<p>frame structure, stiffen, strengthen, reinforce, design brief, design specification, prototype, annotated</p>

<p>Art and Design Computing Science – properties and changes of materials Geography – biomes? Mathematics</p>	<p>Investigate and evaluate a range of existing portable and permanent frame structures. Research key events and individuals relevant to frame structures. Design Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches. Select/Make Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. Use finishing and decorative techniques suitable for the product they are designing and making. Evaluate Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.</p>	<p>playground shelter., market stall, bus shelter, tent, play house, gazebo, bird hide, parasol, park furniture, adventure playground equipment, kite. Knowledge and understanding</p> <ul style="list-style-type: none"> Understand how to strengthen, stiffen and reinforce 3-D frameworks. Understand how to use tools and equipment accurately and the techniques for accurately joining framework materials together. Able to discuss the brief of designing and making a small-scale frame structure and can generate innovative ideas, supported by a step by step plan. Know how to model their ideas first using materials such as paper, card and paper straws. Know the importance of making their products with accuracy, regularly evaluate their work and their completed product, drawing on their design specification, and thinking about the intended purpose and user. Know and use technical vocabulary relevant to the project. 	<p>sketch, purpose, user, research stability, shape, join.</p> <p>Wider Vocab: innovation, triangulation, temporary, permanent , functional</p>
<p>Y6 Subject link opportunities: Spoken language Computing Mathematics English (writing)v</p>	<p>Mechanical Systems Explore Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. Investigate famous manufacturing and engineering companies relevant to the project. Design Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources.</p>	<p>Mechanical Systems – pulleys or gears Potential project with Barnwell? Project Question: Design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose). Technical knowledge and understanding</p> <ul style="list-style-type: none"> Understand that mechanical and electrical systems have an input, process and an output. 	<p>annotated drawings, exploded diagrams, input, process, output circuit, switch, circuit diagram, design decisions, user, purpose, design specification, design brief</p> <p>Wider Vocab: pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor, mechanical system, electrical system, functionality, innovation, authentic.</p>

	<p>Develop a simple design specification to guide their thinking. Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.</p> <p>Select/Make Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.</p> <p>Evaluate Compare the final product to the original design specification. Consider the views of others to improve their work.</p>	<ul style="list-style-type: none"> • Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. • Know how to use observational drawings and questions to develop understanding of products explored. • Know how to collectively develop an authentic and meaningful design brief. • Understand how to generate innovative ideas by carrying out research and develop a design specification for their product, carefully considering the purpose and intended user for their product. • Demonstrate knowledge of the importance of accurate use of tools and equipment. • Know how to produce detailed step-by-step plans and lists of tools, equipment and materials needed. • Know how to make high quality products, and use a range of decorative finishing techniques, applying understanding and skills to ensure a well finished final product that matches the intended user and purpose. • Know how to critically evaluate throughout and the final product in use, comparing it to the original design specification. • Know and use technical vocabulary relevant to the project. 	
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	Summer Term		Key Vocabulary
	Skills	Knowledge	
<p>Y1</p> <p>Subject link opportunities:</p> <p>Spoken language Mathematics History - Victorians Human Geography – seaside structures</p>	<p>Structures – creating a freestanding structure</p> <p>Explore Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings</p> <p>Design Generate ideas based on simple design criteria and their own experiences, explaining what they could make. Develop, model and communicate their ideas through talking, mock-ups and drawings.</p> <p>Make Plan by suggesting what to do next. Select and use tools, skills and techniques, explaining their choices. Select new and reclaimed materials and construction kits to build their structures. Use simple finishing techniques suitable for the structure they are creating.</p> <p>Evaluate Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.</p>	<p>Structures – creating a freestanding structure</p> <p>Project Question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)?</p> <p>To be completed by the teacher</p> <p>What could children design, make and evaluate? enclosures for farm or zoo animals, playground/park/garden furniture, bridge for Billy Goats Gruff , playground equipment, furniture for the Three Bears</p> <p>Knowledge and understanding</p> <ul style="list-style-type: none"> Know how to make freestanding structures stronger, stiffer and more stable. Know how to answer designing, making and evaluating questions e.g. <i>Who will your product be for? What will be its purpose? What materials will you use? How will you make it strong and stable?</i> Know and use the class planning of the order in which the structures will be made. Know and use technical vocabulary relevant to the project. 	<p>cut, fold, weak, strong join, circle, triangle, square, rectangle, design, make</p> <p>Wider Vocab: structure, fix, wall, tower, framework, , base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved, metal, wood, plastic, cuboid, cube, cylinder, evaluate, user, purpose, ideas, design criteria, product, function</p>
<p>Y2</p> <p>Subject link opportunities:</p> <p>Spoken language Mathematics Science – plants</p>	<p>Food</p> <p>Explore Taste and evaluate a range of fruit and vegetables to determine the intended user’s preferences. Handle, smell and taste fruit and vegetables in order to describe them through talking and drawing.</p> <p>Design</p>	<p>Food – preparing fruit and vegetables</p> <p>Project question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)? To be completed by the teacher.</p> <p>What could children design, make and evaluate? Fruit salads, fruit yogurt, fruit drinks, fruit jelly ,fruit smoothies , vegetable salads , fruit and vegetable kebabs</p> <p>Technical knowledge and understanding</p>	<p>fruit and vegetable names, names of equipment and utensils, sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp,</p>

<p>English (writing)</p>	<p>Design appealing products for a particular user based on simple design criteria. Generate initial ideas and design criteria through investigating a variety of fruit and vegetables. Communicate these ideas through talk and drawings.</p> <p>Make Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.</p> <p>Evaluate Evaluate ideas and finished products against design criteria, including intended user and purpose.</p>	<ul style="list-style-type: none"> Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. Understand and use basic principles of a healthy and varied diet to prepare dishes. Understand basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. <i>What should we do before we work with food? Why is following instructions important?</i> Know how to use simple utensils and can practise food-processing skills such as washing, grating, peeling, slicing, squeezing. Understand how to plan for a product. Children show they can answer questions such as: <i>What will you need? What fruit/vegetable will you need? How much will you need? How will you present the product?</i> Know and use technical and sensory vocabulary relevant to the project. 	<p>sour, hard, ingredients, design, make.</p> <p>Wider Vocab: flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, planning, investigating tasting, arranging, popular, evaluate, criteria</p>
<p>Y3</p> <p>Subject link opportunities:</p> <p>Spoken language Mathematics Computing</p>	<p>Textiles— using a 2D pattern to create a 3D product</p> <p>Explore Investigate a range of 3-D textile products relevant to the project</p> <p>Design Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s. Produce annotated sketches, prototypes, final product sketches and pattern pieces.</p> <p>Make Plan the main stages of making. Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing.</p>	<p>Textiles – using a 2D pattern to create a 3D product</p> <p>Project question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose). To be completed by the teacher.</p> <p>What could children design, make and evaluate? purse/wallet, soft toy/mascot, apron, fashion accessory beach bag, shoe bag, pencil case, story sack.</p> <p>Technical knowledge and understanding</p> <ul style="list-style-type: none"> Know how to create a design brief and design criteria, supported by the teacher, set within a context which is authentic and meaningful. 	<p>fabric, names of fabrics, fastening, zip, button, templates, stitch, user, purpose, design, evaluate, label, drawing, pattern pieces</p> <p>Wider Vocab: compartment, structure, finishing technique, strength, weakness, stiffening, seam, seam allowance, model, prototype, annotated sketch, functional,</p>

	<p>Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.</p> <p>Evaluate</p> <p>Test their product against the original design criteria and with the intended user.</p> <p>Take into account others' views.</p> <p>Understand how a key event/individual has influenced the development of the chosen product and/or fabric.</p>	<ul style="list-style-type: none"> • Can discuss the intended user, purpose and appeal of their product and choose fabrics that are suitable for this. • Know how to sketch and annotate a range of possible ideas and produce mock-ups and prototypes of their chosen product. Know how to plan the main stages of making e.g. using a flowchart or storyboard. • Know how to strengthen, stiffen and reinforce existing fabrics and how to how to securely join two pieces of fabric together. • Know about a range of stitching techniques and finishing techniques and understand the need for patterns and seam allowances. • Know how to evaluate as the process is undertaken and the final product in relation to the design brief and criteria. • Know and use technical vocabulary relevant to the project 	<p>innovative, investigate, aesthetics, function,</p>
<p>Y4 Subject link opportunities:</p> <p>Spoken language Mathematics Science – living things</p>	<p>Food - healthy and varied diet. Creating Savoury muffins.</p> <p>Explore</p> <p>Carry out sensory evaluations of a variety of ingredients and products.</p> <p>Record the evaluations using e.g. tables and simple graphs.</p> <p>Design</p> <p>Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose.</p> <p>Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.</p> <p>Select/Make</p>	<p>Food – healthy and varied diet Creating Savoury muffins.</p> <p>Project question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)? Set by teacher.</p> <p>What could children design, make and evaluate? Savoury muffins, wraps, rolls, pitta pockets, blinis, rice cakes, toasties, snack bar, salad snacks</p> <p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Know about a variety of ingredients and how to use appropriate equipment and utensils to prepare and combine food. • Develop further knowledge of to the principles of a varied and healthy diet. 	<p>Name of products, names of equipment, utensils, techniques and ingredients hygienic, savoury, sweet</p> <p>planning, design criteria, purpose, evaluations</p> <p>Wider Vocab: texture, taste, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet, user, annotated sketch, sensory</p>

	<p>Plan the main stages of a recipe, listing ingredients, utensils and equipment.</p> <p>Select and use appropriate utensils and equipment to prepare and combine ingredients.</p> <p>Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.</p> <p>Evaluate</p> <p>Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.</p>	<ul style="list-style-type: none"> • Know how to use a range of techniques as appropriate to prepare ingredients hygienically and continue to build on food hygiene practices when handling food including the importance of following instructions to control risk. • Know how to develop and agree on design criteria with teacher, including criteria relating to healthy eating and a varied diet. • Know how to generate a range of ideas and use discussion, annotated sketches and information and communication technology if appropriate, to develop and communicate their ideas. • Know how to evaluate as the assignment proceeds and the final product against the intended purpose and user, reflecting on the design criteria and other people's opinions. • Know and use relevant technical vocabulary relevant to the project 	
<p>Y5 Subject link opportunities:</p> <p>Spoken language Mathematics Computing</p>	<p>Electrical Systems</p> <p>Explore</p> <p>Discuss a range of relevant products (such as nightlights, garden lights, alarm systems, security lighting, electronic moneyboxes) that respond to changes in the environment using a computer control program.</p> <p>Investigate sensors such as light dependent resistors (LDRs) and a range of switches such as push-to-make, push-to-break, toggle, micro and reed switches.</p> <p>Drawing on science understanding, explore a range of electrical systems that could be used to control their products, including a simple series circuit where a single output device is controlled, a series circuit where two output devices are controlled by one switch and, where appropriate, parallel circuits where two output devices are controlled independently by two separate switches</p>	<p>Electrical Systems</p> <p>Potential link to Barnwell workshop?</p> <p>Project question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)?</p> <p>What could children design, make and evaluate?</p> <p>Cycle or vehicle alarm, security lighting system, alarm for valuable artefact, garden light, automatic nightlight, electronic moneybox, alarm for school shed.</p> <p>Knowledge and understanding</p> <ul style="list-style-type: none"> • Understand and use electrical systems in their products. • Understand the use of computer control systems in products and apply their understanding of 	<p>design specification, design brief, user, purpose, 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</p> <p>Wider Vocab: reed switch, toggle switch, push-to-make switch, push-to-break switch, light dependent resistor (LDR), tilt switch, function, innovative,</p>

	<p>Research famous inventors related to the project e.g. Thomas Edison – light bulb.</p> <p>Design Develop a design specification for a functional product that responds automatically to changes in the environment. Generate, develop and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams.</p> <p>Make Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. Create and modify a computer control program to enable their electrical product to respond to changes in the environment.</p> <p>Evaluate Continually evaluate and modify the working features of the product to match the initial design specification. Test the system to demonstrate its effectiveness for the intended user and purpose.</p>	<p>computing to program, monitor and control their products.</p> <ul style="list-style-type: none"> • Know how to collectively develop an authentic and meaningful design brief. • Know how to generate innovative ideas by drawing on research and develop a design specification for their product, carefully considering the purpose and needs of the intended user. • Able to communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams, indicating design decisions made. • Know how to produce detailed step-by-step plans and lists of tools, equipment and materials needed. • Know how to critically evaluate throughout and the final product, comparing it to the original design specification. Know how to test the system to demonstrate its effectiveness for the intended user and purpose. • Know and use technical vocabulary relevant to the project. 	
<p>Y6</p> <p>Subject link opportunities:</p> <p>Spoken language Mathematics English (writing)</p>	<p>Food – Celebrating Cultures. Making pizza</p> <p>Explore Use first hand and secondary sources to carry out relevant research into existing products. Able to carry out sensory evaluations of a variety of existing food products and ingredients relating to the project.</p> <p>Design Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification.</p>	<p>Food – celebrating cultures. Making Pizza</p> <p>Project question: How can we design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose)?</p> <p>What could children design, make and evaluate? Bread, pizza ,savoury biscuits, savoury scones, savoury muffin, cereal snack, soup.</p> <p>Technical knowledge and understanding</p>	<p>ingredients, fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, utensils, design specification, innovative, research, evaluate, design brief</p>

	<p>Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose. Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas.</p> <p>Select/Make</p> <p>Write a step-by-step recipe, including a list of ingredients, equipment and utensils</p> <p>Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients.</p> <p>Make, decorate and present the food product appropriately for the intended user and purpose.</p> <p>Evaluate.</p> <p>Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements.</p>	<ul style="list-style-type: none"> Know how to safely use utensils and equipment including heat sources to prepare and cook food. Understand about seasonality in relation to food products. Know and use relevant technical and sensory vocabulary. Know how to develop a design brief and simple design specification to develop and evaluate their product, including design criteria relating to nutrition and healthy eating. Able to consider the intended purpose and user carefully in the design and creation of their product. Able to independently record the steps, equipment, utensils and ingredients for making the food product, drawing on the knowledge, understanding and skills learnt previously. 	<p>Wider Vocab: source yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs, seasonality, , crumble</p>
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We have identified the most crucial knowledge that we want to ensure all children know in each year group. These are called our 'Golden Nuggets'. These are identified by a golden box around the statement

