



YEAR: 6

TERM: Autumn 1

TITLE: Design, Make and Evaluate a Model of a Building (Structures - Frame Structures)

	COHERENCE	CREDIBILITY	CREATIVITY	COMPASSION	COMMUNITY
<p>REVISION / REMIND / REVISIT Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials. Basic understanding of what structures are and how they can be made stronger, stiffer and more stable.</p>	<p>THE BIG QUESTION</p> <p>What structure can we make to improve Camp Green Lake?</p> <p>LINKS to NC/rationale: Design Carry out research into user needs and existing products, using surveys, interviews, questionnaires, and web-based resources Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources, and cost Make</p>	<p>Knowledge Acquired Investigative and Evaluative Activities: Children investigate and make annotated drawings of a range of portable and permanent frame structures eg. tents, bus shelters, umbrellas. How well does the frame structure meet user's needs and purposes? Why were materials chosen? What methods of construction have been used? How has the framework been strengthened, reinforced, and stiffened? How does the shape of the framework affect its strength? How innovative is the design? Research key individuals related to the study of frame structures - Stephen Sauvestre, a French architect and Gustave Eiffel, a French engineer</p> <p>Skills/Concepts Explored Focused Tasks: Use a construction kit consisting of plastic strips and paper fasteners to build 2D frameworks. Compare strength</p>	<p>A variety of contributions to a classroom display based on the Big Question</p> <p>Photographs</p> <p>Model of a building for Camp Green Lake</p>	<p>What are the features? Analyse</p> <p>Study Gustave Eiffel (1832 - 1923) - an engineer by training, he founded and developed a company specialising in metal structural work eg. the dome on the Nice observatory, the metallic structure of The Statue of Liberty, the Bordeaux Railway Bridge and The Eiffel Tower</p> <p>The 'answers' to the BIG QUESTION</p> <p>DEEP DIVE</p>	<p>Invite an architect into school to talk about their work</p> <p>Parents help the children put up tents</p>



	<p>Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used</p> <p>Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks</p> <p>Use finishing and decorative techniques suitable for the product they are designing and making</p> <p>Evaluate</p> <p>Investigate and evaluate a range of existing frame structures</p> <p>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>Research key events and individuals relevant to frame structures</p> <p>Technical Knowledge and Understanding</p> <p>Understand how to strengthen, stiffen, and reinforce 3D frameworks</p> <p>Know and use technical vocabulary relevant to the project</p>	<p>of square and triangular frameworks. Children reinforce square frameworks using diagonals to develop understanding of using triangulation to add strength to a structure.</p> <p>Make paper tubes from rolling sheets of newspaper diagonally around pieces of eg. dowel. Use these tubes to build 3D frameworks - how could they be strengthened?</p> <p>Develop skills and techniques - using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to construct wooden frames.</p> <p>Practise accurately joining framework materials together</p> <p>Key vocabulary:</p> <p>Frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent</p> <p>Design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional</p>		<div data-bbox="1393 268 1776 639" style="border: 1px solid black; background-color: yellow; padding: 5px;"> <p>Health and safety</p> <p>Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task.</p> <p>Risk assessments should be carried out prior to undertaking this project.</p> </div>	
--	---	--	--	---	--

ASSESSMENT CRITERIA:

- Carry out research; develop a simple design specification; describe the user, purpose and design features of their products and explain how they will work.
- Generate innovative ideas drawing on research; use a range of drawing skills, discussion and prototypes, pattern pieces and computer- aided design.
- Formulate lists of resources and step-by-step plans; select suitable tools, equipment, materials and components and explain their choices.
- Follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with accuracy.
- Identify strengths and areas to develop in their ideas and products against their design specification; consider the views of others to make improvements.
- Investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used and how well they work, and how innovative and sustainable they are.
- Know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control and monitor their products; how to reinforce and strengthen a framework; use the correct technical vocabulary.
- Know about inventors, designers, engineers, chefs and manufacturers who have developed ground breaking products. GUSTAVE EIFFEL

Cross Curricular Links

Science - compare and group together everyday materials on the basis of their properties.

Mathematics - identify 3-D shapes, including cubes and other cuboids, from 2-D representations. Recognise, describe and build simple 3-D shapes. Apply understanding and skill to carry out accurate measuring using standard units i.e. cm/mm.

Spoken language - ask relevant questions, formulate and express opinions, give well-structured descriptions and explanations. Use relevant strategies to build their vocabulary.

Computing - use technologies for research purposes and be discerning when evaluating digital content.

Art and design - use and develop drawing skills.



YEAR: 6

TERM: Autumn 2

TITLE: Design, Make and Evaluate a Security System (Electrical Systems - More complex switches and Circuits with Monitoring and Control)

	COHERENCE	CREDIBILITY	CREATIVITY	COMPASSION	COMMUNITY
<p>REVISION / REMIND / REVISIT Understanding of the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product. Initial experience of using computer control software and an interface box or a standalone box, e.g. writing and modifying a program to make a light flash on and off.</p>	<p>THE BIG QUESTION</p> <p>How do we make the buildings of Camp Green Lake secure?</p> <p>LINKS to NC/rationale: 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 Make Formulate a step-by-step plan to guide making, listing tools, equipment, materials, and components</p>	<p>Knowledge Acquired Investigative and Evaluative Activities: Using research, discuss products that respond to changes in the environment using a computer control program - automatic night light/ alarm system/ security lighting. Who have the products been designed for and for what purpose? Investigate electrical sensors such as light dependent resistors (LDR'S) and a range of switches including micro switches and reed switches. To understand how they are operated children use each component to control a bulb in a simple circuit. Remind the children of then dangers of mains electricity.</p>	<p>A variety of contributions to a classroom display based on the Big Question</p> <p>Make own switches and choice of inputs - integrating into building design</p> <p>Design more complex virtual system using FLOWOL</p>	<p>Why do we need security systems?</p> <p>The 'answers' to the BIG QUESTION</p> <p>DEEP DIVE</p>	<p>Relate to own homes - find out from relatives about doorbells/alarms</p> <p>Look at crime statistics in Knowle - where is the priority for security systems?</p>
	<p>Skills/Concepts Explored Focused Tasks: Through teacher demonstration and explanation recap measuring, marking out, cutting, and joining skills with construction materials that the children will need to create their electrical products</p>				

	<p>Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product Create and modify a computer-controlled program to enable their electrical product to respond to changes in the environment</p> <p>Technical Knowledge and Understanding Understand and use electrical systems in their products Understand the use of computer control systems in products Apply their understanding of computing to program, monitor and control their products Know and use technical vocabulary relevant to the project</p>	<p>Children practise methods for making secure electrical connections eg, using automatic wire strippers, twist and tape electrical connections, screw connections and connecting blocks.</p> <p>Explore simple series circuit where a single output device is controlled, a series circuit where 2 output devices are controlled by 1 switch and a parallel circuit where 2 output devices are controlled independently by 2 separate switches.</p> <p>Children write computer control programs that include inputs, outputs and decision making. How to avoid making short circuits</p> <p>Key vocabulary: Series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart Function, innovative, design specification, design brief, user, purpose 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</p>		<div data-bbox="1453 344 1794 783" style="border: 1px solid black; background-color: yellow; padding: 5px;"> <p>Health and safety Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project</p> </div>	
--	--	--	--	--	--

ASSESSMENT CRITERIA:

- Carry out research; develop a simple design specification; describe the user, purpose and design features of their products and explain how they will work.
- Generate innovative ideas drawing on research; use a range of drawing skills, discussion and prototypes, pattern pieces and computer-aided design.
- Formulate lists of resources and step-by-step plans; select suitable tools, equipment, materials, and components and explain their choices.
- Follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine, and finish with accuracy.
- Identify strengths and areas to develop in their ideas and products against their design specification; consider the views of others to make improvements.
- Investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used and how well they work, and how innovative and sustainable they are.
- Know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control and monitor their products; how to reinforce and strengthen a framework; use the correct technical vocabulary.

Cross Curricular Links

Spoken Language - ask relevant questions, give well-structured descriptions and explanations. Build technical vocabulary.

Computing - use technologies for research purposes and be discerning when evaluating digital content. Design, write and debug programs that accomplish specific goals, including controlling physical systems. Use sequence, selection, and repetition in programs. Work with variables and various forms of input and output.

Science - apply knowledge and understanding of circuits, switches, conductors and insulators.

Mathematics - apply understanding and skill to carry out accurate measuring using standard units i.e. cm/mm.



YEAR: 6 **TERM: Summer 2** **TITLE: Design, Make and evaluate a Meal for a Member of Staff (Food - Celebrating Culture and Seasonality)**

REVISION / REMIND / REVISIT Have knowledge and understanding about food hygiene, nutrition, healthy eating and a varied diet. Be able to use appropriate equipment and utensils, and apply

COHERENCE	CREDIBILITY	CREATIVITY	COMPASSION	COMMUNITY
<p>THE BIG QUESTION</p> <div style="text-align: center; border: 2px solid purple; padding: 10px; margin: 10px 0;"> <p>How can we celebrate with food?</p> </div> <p>LINKS to NC/rationale: Design Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification 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 ICT as appropriate to develop and communicate ideas</p>	<p>Knowledge Acquired Investigative and Evaluative Activities: Children use first-hand and secondary sources to research existing products to include personal/cultural preferences, ensuring a healthy diet, meeting dietary needs and the availability of locally sourced/seasonal/organic ingredients. This could include a visit to a bakery/farm shop/supermarket. What ingredients are sourced locally/in the UK/overseas. Children carry out sensory evaluations of a variety of existing products and ingredients - herbs, cheese (locally sourced/seasonal/Fair Trade or organic). Questions to support children's ability to evaluate food ingredients and products - What ingredients help to make the product spicy/crisp/crunchy etc What is the impact of the added</p>	<p>A variety of contributions to a classroom display based on the Big Question</p> <p>Photographs/information about how different cultures celebrate with food</p> <p>Designs/photographs of children's ideas Recipes and lists of ingredients, utensils/equipment</p> <p>Prepare questions for staff to evaluate the meal - taste, texture, presentation, did it meet the design brief, improvements etc</p>	<p>How is food used in different cultural celebrations? Eid? Easter? (Lent) Christmas?</p> <div style="text-align: center; margin: 20px 0;"> <div style="border: 2px solid purple; padding: 10px; display: inline-block;"> <p>The 'answers' to the BIG QUESTION</p> </div> </div> <div style="text-align: center; margin-top: 10px;"> <div style="background-color: #4a90e2; color: white; padding: 5px 20px; border-radius: 15px; display: inline-block;"> <p>DEEP DIVE</p> </div> </div>	<p>Discussions with staff about likes/dislikes/allergies/intolerances</p> <p>Share food with members of staff</p> <p>Feedback from staff</p>

	<p>Make Write a step-by-step recipe, including a list of ingredients, equipment, and utensils Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients Make, decorate, and present the food product appropriately for the intended user and purpose</p> <p>Evaluate Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using eg. Tables/graphs/charts such as star diagrams Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements Understand how key chefs have influenced eating habits to promote varied and healthy diets</p> <p>Technical Knowledge and Understanding</p>	<p>ingredients on the finished product? Research key chefs and how they have promoted seasonality, local produce, and healthy eating</p> <p>Skills/Concepts Explored Focused Tasks: Measure out, cut, shape, and combine eg. Knead, beat, rub, and mix ingredients Use appropriate utensils and equipment safely and hygienically Practise techniques following a basic recipe to prepare and cook a savoury food product. Ask questions about which ingredients could be changed or added in a basic recipe such as types of flour, seeds, garlic, vegetables. Consider texture, taste, appearance, and smell When making a basic dough recipe, explore making different shapes to change the appearance of the food product eg Which shape is most appealing and why?</p> <p>Key vocabulary: Ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs Fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy,</p>		<p>Health and safety Pupils should be taught to work safely and hygienically, using tools, equipment, techniques and ingredients appropriate to the task. Prior to undertaking this project risk assessments should be carried out, including identifying whether there are children who are not permitted to taste or handle any food ingredients or products.</p>	
--	---	---	--	--	--

	<p>Know how to use utensils and equipment including heat sources to prepare and cook food</p> <p>Understand about seasonality in relation to food products and the source of different food products</p> <p>Know and use relevant technical and sensory vocabulary</p>	<p>allergy, intolerance, savoury, sauce, seasonality</p> <p>Utensils, combine, fold, kneed, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble</p> <p>Design specification, innovative, research, evaluate, design brief</p>			
<p>ASSESSMENT CRITERIA:</p> <ul style="list-style-type: none"> • Know that food is grown, reared and caught in the UK, Europe and the wider world; that seasons may affect the food available; how food is processed into ingredients. • Know how to prepare a variety of dishes safely and hygienically using, where appropriate, a heat source; that different food and drink contain nutrients, water and fibre that are needed for health. 					

Cross Curricular Links

Mathematics and computing - making use of mathematical and computing skills to present results of sensory evaluations graphically, handling and interpreting data.

Spoken language - developing relevant vocabulary including sensory descriptors. Give well-structured explanations. Articulate and justify answers and opinions. Listen and respond to adults and peers.

Science - using and developing skills of observing, questioning, properties and changing state of ingredients. Recognise the impact of diet on the way their bodies function.

Geography - distribution of natural resources i.e. food.

Computing - use technology purposefully to retrieve digital content.

Mathematics - measuring mass kg/g. Understand and use approximate equivalences between metric and imperial units.

Art and design - using and developing drawing skills.

Writing - purpose of writing e.g. for planning and evaluation.