



YEAR: 5

TERM: Autumn 2

TITLE: Design, Make and evaluate a Toy (Mechanical systems - Cams)

	COHERENCE	CREDIBILITY	CREATIVITY	COMPASSION	COMMUNITY
<p>REVISION / REMIND / REVISIT Experience of axles, axle holders and wheels that are fixed or free moving. Basic understanding of different types of movement. Experience of cutting and joining techniques with a range of materials including card, plastic and wood. An understanding of how to strengthen and stiffen structures.</p>	<p style="text-align: center;">THE BIG QUESTION</p> <div style="text-align: center; margin: 10px 0;"> <p>Can you cheer up a younger sibling/relation/friend if they are feeling unwell or sad?</p> </div> <p>LINKS to NC/rationale: Design Generate innovative ideas by carrying out research using surveys, interview, questionnaires, and web-based resources Develop a simple design specification to guide their thinking Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views Make Produce detailed lists of tools, equipment, and materials. Formulate step by step plans and</p>	<p>Knowledge Acquired Investigative and Evaluative Activities: Discuss different types of movement - rotary, oscillating and reciprocating. Make simple models of different types of cams (or have toys in which cam mechanisms can be seen). Also use videos and computer animations to illustrate cams. Use observational drawings to develop understanding of the products in the handling collection and those children have researched. How innovative is the product? What type of movement can be seen? What types of mechanical components are used and where are they positioned?</p> <p>Skills/Concepts Explored Focused Tasks: Children explore pre-cut cams made from MDF or wooden wheels to mount on a piece of board and observe their movement with a follower. Demonstrate how to use a hand drill safely to make an</p>	<p>A variety of contributions to a classroom display based on the Big Question</p> <p>Annotated sketches</p> <p>Photographs of process and the final product</p> <p>Illustrate how a cam design can help create a moving toy</p>	<p>Think about others. If someone is feeling sad, what could you say to them?</p> <p>If a younger sibling/relation/friend is feeling unwell or sad perhaps you could cheer them up with your moving toy/ tell them a story using the toy etc.</p> <div style="text-align: center; margin-top: 20px;"> <p>The 'answers' to the BIG QUESTION</p> <div style="text-align: center;"> </div> <div style="text-align: center; margin-top: 10px;"> </div> </div>	<p>Relate to their own home life - what toy would a younger sibling/relation/friend like to play with?</p> <p>Ask siblings/relations/friends questions - to produce design criteria What are their favourite characters, colours etc?</p>

	<p>if appropriate, allocate tasks within a team</p> <p>Select from and use a range of tools and equipment to make products that are accurately assembled and well finished.</p> <p>Work within the constraints of time, resources, and cost.</p> <p>Evaluate</p> <p>Compare the final product to the original design specification</p> <p>Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality, and fitness for purpose</p> <p>Consider the views of others to improve their work</p> <p>Investigate famous manufacturing and engineering companies relevant to the project</p> <p>Technical Knowledge and Understanding</p> <p>Understand that mechanical systems have an input, process and an output</p> <p>Understand how cams can be used to produce different types of movement and change the direction of movement</p> <p>Know and use technical vocabulary relevant to the project</p>	<p>off-centre cam and position it accurately in a housing. Ensure children secure the wheel with a G-clamp and use a piece of scrap wood under the wheel to avoid drilling through the table.</p> <p>Stress importance of measuring accurately and checking before cutting any holes or gluing. Important to line up the cam and the follower otherwise the mechanism may not work smoothly.</p> <p>Develop measuring, marking, cutting, shaping, and joining skills using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to make cam mechanisms and construct wooden frames or card housings. Demonstrate the accurate and safe use of tools and equipment.</p> <p>Key vocabulary:</p> <p>Cam, snail cam, of centre cam, peg cam, pear shaped cam</p> <p>Follower, axle, shaft, crank, housing, framework</p> <p>Rotation, rotary motion, oscillating motion, reciprocating motion</p>		<div 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. Risk assessments should be carried out prior to undertaking this project.</p> </div>	
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		<p>Annotated sketches, exploded diagrams</p> <p>Mechanical system, input movement, process, output movement</p> <p>Design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief</p>			
<p>ASSESSMENT CRITERIA:</p> <ul style="list-style-type: none"> • Carry out research; develop a simple design specification; describe the user, purpose and design features of their products and explain how they will work. • Use a range of drawing skills, discussion and prototypes. • 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. • 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. • Know that materials have functional and aesthetic qualities; that systems have an input, process and output; use the correct technical vocabulary. 					

Cross Curricular Links

Spoken language - ask relevant questions, formulate and express opinions, give well-structured descriptions and explanations. Listen and respond appropriately, articulate and justify answers, arguments and opinions. Consider and evaluate different viewpoints.

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

Science - forces and movement: explore the effects of simple machines on movement. Identify and compare the suitability of a variety of everyday materials for particular uses.

Mathematics - use mathematical vocabulary to describe position, direction and movement. Choose and use appropriate standard units (i.e. cm/mm) to estimate and accurately measure length/height.

Art and design - use and apply drawing skills. Use techniques with colour, pattern, texture, line and shape.



YEAR: 5

TERM: Spring 2

TITLE: Design, Make and Evaluate a Pizza (Food – Celebrating Culture and Seasonality)

	COHERENCE	CREDIBILITY	CREATIVITY	COMPASSION	COMMUNITY
<p>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 a range of techniques for measuring out, preparing and combining ingredients.</p>	<p>THE BIG QUESTION</p> <p>Can we create a healthy pizza for the school menu?</p> <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 Make Write a step-by-step recipe, including a list of ingredients, equipment, and utensils Select and use appropriate utensils and equipment accurately</p>	<p>Knowledge Acquired Investigative and Evaluative Activities:</p> <p>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 ingredients on the finished product?</p>	<p>A variety of contributions to a classroom display based on the Big Question</p> <p>Balanced argument - Should pizza be banned from the school menu?</p> <p>Annotated sketches, step-by-step recipes, lists of ingredients, equipment etc</p> <p>Using all research/ideas - design a pizza that could be served as a lunch time choice for the children on one day.</p> <p>Photographs of food preparation</p> <p>Design a feedback form</p>	<p>Research key chefs and how they have promoted seasonality, local produce, and healthy eating</p> <p>Good food choices for ourselves and the planet</p> <p>The 'answers' to the BIG QUESTION</p> <p>DEEP DIVE</p>	<p>Children research specific ingredients in a supermarket/farm shop with their parents - Are they sourced locally/from the UK/overseas?</p> <p>Pizza taken home to cook and share with family</p> <p>Family feedback form</p> <p>Kitchen staff to serve pizza to children in school</p>

	<p>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 Know how to 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</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, allergy, intolerance, savoury, sauce, seasonality</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>	
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		Utensils, combine, fold, kneed, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble Design specification, innovative, research, evaluate, design brief			
ASSESSMENT CRITERIA: <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.


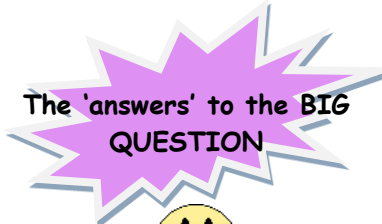


Writing - purpose of writing e.g. for planning and evaluation.



YEAR: 5

TERM: Summer 2

TITLE: Design, Make and evaluate a Hat (Textiles - Combining Different Fabric Shapes Using CAD)

	COHERENCE	CREDIBILITY	CREATIVITY	COMPASSION	COMMUNITY
REVISION / REMIND / REVISIT Experience of basic stitching, joining textiles and finishing techniques. Experience of making and using simple pattern pieces. Experience of simple computer-aided design applications.	<p style="text-align: center;">THE BIG QUESTION</p> <div style="text-align: center;">  <p>What is the best material to make an explorer's hat?</p> </div> <p>LINKS to NC/rationale: Design Generate innovative ideas by carrying out research including surveys, interviews, and questionnaires Develop, model, and communicate ideas through talking, drawing, templates, mock-ups, and prototypes and, where appropriate CAD Design purposeful, functional, appealing products for the intended user that are fit for</p>	<p>Knowledge Acquired Investigative and Evaluative Activities: Investigate, analyse, and evaluate a range of existing products which have been produce by combining fabric shapes. Is the product functional or decorative? Who would use the product? What design decisions have been made? What components have been used to enhance the product? Is it innovative? Investigate and analyse how existing products have been constructed. Disassemble a product and evaluate what the fabric shapes look like - how have the parts been joined? How has it been strengthen/stiffened? What fastenings have been used? Investigate properties of textiles - explore insulating properties, water resistance, wear and strength of textiles.</p>	<p>A variety of contributions to a classroom display based on the Big Question</p> <p>Display of different fabrics and their properties</p> <p>Display different ways of joining fabrics together</p> <p>Prototypes</p> <p>CAD work</p> <p>Photographs of the design process and the final product.</p>	<p><i>Research explorers to find out their motivations.</i></p> <p><i>Research the places they explore and the suitable items of clothing they need to wear.</i></p> <div style="text-align: center;">  <p>The 'answers' to the BIG QUESTION</p>  <div style="background-color: #1f77b4; color: white; padding: 5px; display: inline-block; border-radius: 10px;"> DEEP DIVE </div>  </div>	<p>Interview a local 'explorer' or well-travelled individual</p> <p>Conduct a survey to find out where children would like to visit and explore - Rainforest/desert etc and the 'best' hat that would be suitable for each place.</p>

<p>purpose based on a simple design specification</p> <p>Make Product 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 costs</p> <p>Evaluate Investigate and analyse textile products linked to their final product 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>Technical Knowledge A 3-D textile product can be made from a combination of accurately made pattern pieces, Fabric shapes and different fabrics</p>	<p>Skills/Concepts Explored</p> <p>Focused Tasks: Develop skills of threading needles and joining textiles using a range of stitches - improve consistency and appearance of stitches. Develop skills of sewing textiles by joining right side together and making seams. Children investigate how to sew, and shape curved edges by snipping seams, how to tack or attach wadding or stiffening and learn how to start and finish off a row of stitches. Develop skills of 2D pattern making to create a 3D mock up. Remind/teach how to pin a pattern on to fabric ensuring limited wastage, how to leave seam allowance and different cutting techniques. Develop CAD skills to generate pattern pieces.</p> <p>Key vocabulary: Seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces Name of textiles and fastenings used, pins, needles, thread,</p>		<div 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>	
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Fabrics can be strengthened, stiffened, and reinforced where appropriate

pinking shears, fastenings, iron transfer paper
Design criteria, annotate, design decisions, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype
Computer aided design (CAD), computer aided manufacture (CAM)
Font, lettering, text, graphics, menu, scale, modify, repeat, copy, flip

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.
- Use a range of drawing skills, discussion and prototypes.
- 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.
- 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.
- Know that materials have functional and aesthetic qualities; that systems have an input, process and output; use the correct technical vocabulary.

Cross Curricular Links

Spoken language - ask questions, formulate, articulate and justify answers, arguments and opinions. Consider and evaluate different viewpoints. Give a well-structured oral evaluation to include relevant technical vocabulary.

Science - work scientifically investigating properties of fabrics. Children plan different types of scientific enquiries to answer questions.

History - significant person/people in their locality linked to textiles and products e.g. William Morris, Amanda Wakeley

Mathematics - apply knowledge of how 2-D nets can be formed into 3-D shapes; apply skills of accurate measuring using standard units i.e. cm/mm.

Art and design - investigate methods of adding colour, pattern and texture on to textiles and how to make their own textiles through weaving or felt making. Use and apply drawing skills

Computing - children express themselves and develop ideas using a range of information and communication technology resources.

Writing and computing - write and record a radio advert, making use of persuasive writing features, sound effects and music to promote the final product or event it is advertising.

Computing - children express themselves and develop ideas using a range of information and communication technology resources.