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| **Autumn** – Fairground (Electronics & Structures)  **Learning Outcomes** –   * To look at a range of familiar products that use rotating parts. * To investigate ways of using electrical motors to create rotating parts. * To investigate ways of making a framework for a fairground ride. * To design a fairground ride with a rotating part. * To make a fairground ride following a design. * To evaluate a finished product. | | | | | |
| **Throughout the year**   * Describe the purpose of their products * Generate innovative ideas, drawing on research * Make design decisions, taking account of constraints such as time, resources and cost * Produce appropriate lists of tools, equipment and materials that they need * Accurately apply a range of finishing techniques, including those from art and design * Evaluate their ideas and products against their original design specification * Identify the strengths and areas for development in their ideas and products * Consider the views of others, including intended users, to improve their work | | | | | |
| **Skills:** | **Design**   * Identify features of design that will appeal to the intended user * Create own design criteria and specification * Come up with innovative design ideas - Follow and refine a logical plan. * Use annotated sketches, cross-sectional planning and exploded diagrams * Make design decisions, considering, resources and cost * Clearly explain how parts of design will work, and how they are fit for purpose * Independently model and refine design ideas by making prototypes and using pattern pieces | **Make**   * Use selected tools and equipment precisely - Produce suitable lists of tools, equipment, materials needed, considering constraints * Select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics * Create, follow, and adapt detailed step-by-step plans * Explain how product will appeal to audience; make changes to improve quality * Accurately measure, mark out, cut and shape materials/components * Accurately assemble, join and combine materials/components * Accurately apply a range of finishing techniques * Use techniques that involve a number of steps * Be resourceful with practical problems | **Evaluate**   * Evaluate quality of design while designing and making; is it fit for purpose? * Keep checking design is best it can be. * Evaluate ideas and finished product against specification, stating if it’s fit for purpose * Test and evaluate final product; explain what would improve it and the effect different resources may have had | **Technical Knowledge – Electronics/ Structures**   * Select materials carefully, considering intended use of the product, the aesthetics and functionality. * Explain how product meets design criteria * Reinforce and strengthen a 3D frame * Use different types of circuit in product * Think of ways in which adding a circuit would improve product * Program a computer to monitor changes in environment and control product | **Vocabulary**   * Weakness * Rotation * Movement * Structure * Mechanism * Strength * System * Circuit * Materials |
| **Spring** – Chinese Inventors/ Kites (Structures)  **Learning Outcomes** –   * To look at a range of kite designs and understand the uses of kites in ancient China * To build and test prototype kites * To design a kite based on a design criteria * To make a kite following a design plan * To evaluate and adapt a finished product | | | | | |
| **Throughout the year**   * Describe the purpose of their products * Generate innovative ideas, drawing on research * Make design decisions, taking account of constraints such as time, resources and cost * Produce appropriate lists of tools, equipment and materials that they need * Accurately apply a range of finishing techniques, including those from art and design * Evaluate their ideas and products against their original design specification * Identify the strengths and areas for development in their ideas and products * Consider the views of others, including intended users, to improve their work | | | | | |
| **Skills:** | **Design**   * Draw on market research to inform design * Use research of user’s individual needs, wants, requirements for design * Identify features of design that will appeal to the intended user * Create own design criteria and specification * Come up with innovative design ideas - Follow and refine a logical plan. * Use annotated sketches, cross-sectional planning and exploded diagrams * Clearly explain how parts of design will work, and how they are fit for purpose * Independently model and refine design ideas by making prototypes and using pattern pieces * Use computer-aided designs | **Make**   * Use selected tools and equipment precisely - Produce suitable lists of tools, equipment, materials needed, considering constraints * Select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics * Create, follow, and adapt detailed step-by-step plans * Explain how product will appeal to audience; make changes to improve quality * Accurately measure, mark out, cut and shape materials/components * Accurately assemble, join and combine materials/components * Be resourceful with practical problems | **Evaluate**   * Evaluate quality of design while designing and making; is it fit for purpose? * Keep checking design is best it can be. * Evaluate ideas and finished product against specification, stating if it’s fit for purpose * Test and evaluate final product; explain what would improve it and the effect different resources may have had * Do thorough evaluations of existing products considering: how well they’ve been made, materials, whether they work, how they’ve been made, fit for purpose * Evaluate how much products cost to make and how innovative they are * Research and discuss how sustainable materials are * Consider the impact of products beyond their intended purpose * Discuss some key inventors/designers/ engineers/ chefs/manufacturers of ground-breaking products | **Technical Knowledge – Structures**   * Select materials carefully, considering intended use of the product, the aesthetics and functionality. * Explain how product meets design criteria * Reinforce and strengthen a 3D frame | **Vocabulary**   * Kite tail * Air resistance * Invent * Materials * Innovate * Balance * Framework * Sail * Drag * Kite line * Prototype |
| **Summer** – The Great Bread Bake Off (Food & Nutrition)  **Learning Outcomes** –   * To investigate bread products * To investigate and evaluate bread products according to their characteristics * To be able to design a new bread product for a particular person or event. * To be able to make bread based on a plan and design. * To be able to evaluate a finished product. | | | | | |
| **Throughout the year**   * Describe the purpose of their products * Generate innovative ideas, drawing on research * Make design decisions, taking account of constraints such as time, resources and cost * Produce appropriate lists of tools, equipment and materials that they need * Accurately apply a range of finishing techniques, including those from art and design * Evaluate their ideas and products against their original design specification * Identify the strengths and areas for development in their ideas and products * Consider the views of others, including intended users, to improve their work | | | | | |
| **Skills:** | **Design**   * Draw on market research to inform design * Use research of user’s individual needs, wants, requirements for design * Identify features of design that will appeal to the intended user * Create own design criteria and specification * Use annotated sketches, cross-sectional planning and exploded diagrams * Make design decisions, considering, resources and cost | **Make**   * Use selected tools and equipment precisely * Produce suitable lists of tools, equipment, materials needed, considering constraints * Select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics * Create, follow, and adapt detailed step-by-step plans * Explain how product will appeal to audience; make changes to improve quality * Accurately measure ingredients * Accurately assemble, join and combine materials/components * Accurately apply a range of finishing techniques * Use techniques that involve a number of steps * Be resourceful with practical problems | **Evaluate**   * Keep checking design is best it can be. * Evaluate ideas and finished product against specification, stating if it’s fit for purpose * Test and evaluate final product; explain what would improve it and the effect different resources may have had * Evaluate how much products cost to make * Discuss some key inventors/designers/ engineers/ chefs/manufacturers of ground-breaking products | **Technical Knowledge – Food & Nutrition**   * Understand a recipe can be adapted by adding / substituting ingredients * Explain seasonality of foods * Learn about food processing methods * Name some types of food that are grown, reared or caught in the UK or wider world * Adapt recipes to change appearance, taste, texture or aroma. * Describe some of the different substances in food and drink, and how they can affect health - Prepare and cook a variety of savoury dishes safely and hygienically including, where appropriate, the use of heat source. * Use a range of techniques confidently such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. | **Vocabulary**   * Appearance * Origin * Weighing scales * Bake * Ingredients * Bake * Recipe * Balanced diet * Carbohydrates * Knead * Yeast * Sieve |