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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.
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| **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
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| **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
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| **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
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| **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
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| **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.
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| **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
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