Design and Technology

Year 6 – Electrical Systems – Steady Hand Games

Prior Learning

In Year 4, children will:

Design

- Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.

Make

- Making a torch with a working electrical circuit and switch.
- Using appropriate equipment to cut and attach materials.
- Assembling a torch according to the design and success criteria.

Evaluate

- Evaluating electrical products.
- Testing and evaluating the success of a final product.

Technical Knowledge

- To understand that electrical conductors are materials which electricity can pass through.
- To understand that electrical insulators are materials which electricity cannot pass through.

Year 6

In Year 6, children will:

Design

- Designing a steady hand game - identifying and naming the components required.
- Drawing a design from three different perspectives.
- Generating ideas through sketching and discussion.
- Modelling ideas through prototypes.
- Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.

Make

- Constructing a stable base for a game.
- Accurately cutting, folding and assembling a net.
- Decorating the base of the game to a high quality finish.
- Making and testing a circuit.
- Incorporating a circuit into a base.

Evaluate

- Testing own and others finished games, identifying what went well and making suggestions for improvement.

Future Learning

In KS3, children will:

Design

- Use research and exploration, such as the study of different cultures, to identify and understand user needs.
- Identify and solve their own design problems and understand how to reformulate problems given to them.
- Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations.
- Use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses.
- Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools.

Make

- Select from and use specialist tools, techniques, processes, equipment and

- To know that a battery contains stored electricity that can be used to power products. - To know that an electrical circuit must be complete for electricity to flow. - To know that a switch can be used to complete and break an electrical circuit.	- Gathering images and information about existing children's toys. - Analysing a selection of existing children's toys. **Technical Knowledge** - To know that batteries contain acid, which can be dangerous if they leak. - To know the names of the components in a basic series circuit, including a buzzer. **Vocab** Battery, bulb, buzzer, circuit diagram, component, conductor, electrical item, electricity, electronic item, insulator, series circuit, switch, target audience, test, torch, wire	machinery precisely, including computer-aided manufacture. - Select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties. **Evaluate** - Analyse the work of past and present professionals and others to develop and broaden their understanding. - Investigate new and emerging technologies. - Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups. - Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists. **Technical Knowledge** - Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions. - Understand how more advanced mechanical systems used in their products enable changes in movement and force. - Understand how more advanced electrical and electronic systems can

		be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]. - Apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers].

Pupils who are secure will be able to:
- Identify electrical products and explain why they are useful. - Help to make a working switch. - Identify the features of a torch and how it works. - Describe what makes a torch successful. - Create suitable designs that fit the success criteria and their own design criteria. - Create a functioning torch with a switch according to their design criteria.

National Curriculum Subject Content			
Design	Make	Evaluate	Technical Knowledge
- Use research and develop design criteria to inform the design of innovative, functional appealing products that are fit for purpose, aimed at particular individuals or groups. - Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-	- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately - Select from and use a wider range of materials and components, including construction materials, textiles and	- Investigate and analyse a range of existing products. - Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. - Understand how key events and individuals in design and technology	- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. - Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] - Understand and use electrical systems in their products [for example,

sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.	ingredients, according to their functional properties and aesthetic qualities.	have helped shape the world.	series circuits incorporating switches, bulbs, buzzers and motors]. - Apply their understanding of computing to program, monitor and control their products.