Design and Technology

Year 5 – Mechanisms – Moving Pop-up Book

Prior Learning

In Year 2, children will:

Design

- Creating a class design criteria for a moving monster.
- Designing a moving monster for a specific audience in accordance with a design criteria.

Make

- Making linkages using card for levers and split pins for pivots.
- Experimenting with linkages adjusting the widths, lengths and thicknesses of card used.
- Cutting and assembling components neatly.

Evaluate

- Evaluating own designs against design criteria.
- Using peer feedback to modify a final design.

Technical Knowledge

- To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.

Year 5

In Year 5, children will:

Design

- Designing a pop-up book which uses a mixture of structures and mechanisms.
- Naming each mechanism, input and output accurately.
- Storyboarding ideas for a book.

Make

- Following a design brief to make a pop up book, neatly and with focus on accuracy.
- Making mechanisms and/or structures using sliders, pivots and folds to produce movement.
- Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.

Evaluate

- Evaluating the work of others and receiving feedback on own work.
- Suggesting points for improvement.

Technical Knowledge

- To know that mechanisms control movement.

Future Learning

In Year 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 there is always an input and output in a mechanism. - To know that an input is the energy that is used to start something working. - To know that an output is the movement that happens as a result of the input. - To know that a lever is something that turns on a pivot. - To know that a linkage mechanism is made up of a series of levers.	- To understand that mechanisms can be used to change one kind of motion into another. - To understand how to use sliders, pivots and folds to create paper-based mechanisms. **Vocab** Criteria, design, input, mechanism, model, motion, reinforce, research	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:
- Produce a suitable plan for each page of their book. - Produce the structure of the book. - Assemble the components necessary for all their structures/mechanisms. - Hide the mechanical elements with more layers using spacers where needed. - Use a range of mechanisms and structures to illustrate their story and make it interactive for the users. - Use appropriate materials and captions to illustrate the story.

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.