

***Our Intent is: To support our pupils in answering the question, "How do we design, make and evaluate solutions to real and relevant problems?" Using creativity and innovation, we inspire pupils to develop skills which impact on daily life.***



## Forton Primary School Design and Technology

Clougha Class  
Spring 2  
Year B

Key Concept: Mechanical  
Systems

Focus: Levers and linkages

Key Question: What does the type of movement  
using levers and linkages remind you of?

### N.C. LINKS:

When designing and making, pupils should be taught to: **Design**

- 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-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design
- **Make**
- 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 ingredients, according to their functional properties and aesthetic qualities
- **Evaluate**
- 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 have helped shape the world
- **Technical knowledge**
- 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]

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	<ul style="list-style-type: none"> <li>• understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]</li> <li>• apply their understanding of computing to program, monitor and control their products</li> </ul>
<p><b>Unit Overview:</b> To create levers and linkages to bring a picture to life through movement.</p>	<p><b>Vocabulary:</b> mechanism, lever, linkage, pivot, slot, bridge, guide  system, input, process, output  linear, rotary, oscillating, reciprocating  user, purpose, function  prototype, design criteria, innovative, appealing, design brief</p>
<p><b>Possible Outcome:</b> story book    poster    class display    greetings card    information book    storyboard</p>	
<p><b>Intended User:</b> themselves    younger children    older children teenagers    parents    grandparents    visitor to school    friends</p>	
<p><b>Building on Prior learning KS1:</b></p> <ul style="list-style-type: none"> <li>• Early experiences of working with paper and card to make simple flaps and hinges.</li> </ul>	<p><b>Building on Prior learning when A follow B:</b></p> <ul style="list-style-type: none"> <li>• Explored and used mechanisms such as flaps, sliders and levers.</li> <li>• Gained experience of basic cutting, joining and finishing techniques with paper and card.</li> </ul>

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- Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape.

### **Key Skills (Disciplinary)**

#### **Designing**

- Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user.
- Use annotated sketches and prototypes to develop, model and communicate ideas.

#### **Making**

- Order the main stages of making.
- Select from and use appropriate tools with some accuracy to cut, shape and join paper and card.
- Select from and use finishing techniques suitable for the product they are creating.

#### **Evaluating**

- Investigate and analyse books and, where available, other products with lever and linkage mechanisms.
- Evaluate their own products and ideas against criteria and user needs, as they design and make.

#### **Technical knowledge and understanding**

- Understand and use lever and linkage mechanisms.
- Distinguish between fixed and loose pivots.
- Know and use technical vocabulary relevant to the project.

### **Sequence of Lessons:**

1. Investigative and Evaluative Activities

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- Children investigate, analyse and evaluate books and, where available, other products which have a range of lever and linkage mechanisms.
- Use questions to develop children's understanding e.g. *Who might it be for? What is its purpose? What do you think will move? How will you make it move? What part moved and how did it move? How do you think the mechanism works? What materials have been used? How effective do you think it is and why? What else could move?*

## **2. Focused Tasks**

- Demonstrate a range of lever and linkage mechanisms to the children using prepared teaching aids.
- Use questions to develop children's understanding e.g. *Which card strip is the lever? Which card strip is acting as the linkage? Which part of the system is the input and which part the output? What does the type of movement remind you of? Which are the fixed pivots and which are the loose pivots?*
- Demonstrate the correct and accurate use of measuring, marking out, cutting, joining and finishing skills and techniques.
- Children should develop their knowledge and skills by replicating one or more of the teaching aids.

## **3. Design, Make and Evaluate Assignment**

- Develop a design brief with the children within a context which is authentic and meaningful.
- Discuss with children the purpose of the products they will be designing and making and who the products will be for. Ask the children to generate a range of ideas, encouraging creative responses. Agree on design criteria that can be used to guide the development and evaluation of the children's products.
- Using annotated sketches and prototypes, ask the children to develop, model and communicate their ideas.
- Ask the children to consider the main stages in making before assembling high quality products, drawing on the knowledge, understanding and skills learnt through IEAs and FTs.
- Evaluate the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.

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Enhancements: N/A	End of Unit Outcome: Working levers and linkages