

Preston Primary School Knowledge Organiser

Topic: Design and Technology

Term: Spring 2

Year: Unit 3

Duration: 4 Weeks

Mechanical Systems

In this Long Enquiry, the children will be making fully functional mechanical moving picture books using levers and linkages.

The Powerful Knowledge we will take away from this Learning Enquiry (what we will be learning):

- I know that a moving picture book can be made using a mechanical system of levers and linkages.



- I know that levers are attached to material and move around a pivot. These can be used to create moving parts of an object.
- I know that pivots can be loose or fixed. A loose pivot joins the lever to another lever so they both move at the same time. A fixed pivot fixes the lever to the material and main object. We will need to use both kinds to make our mechanical moving picture books.



- I can make a lever that can move in linear, reciprocating, or oscillating movements. Pivots are a vital component.

- We can make our own levers by carefully designing, measuring, and cutting card.



- Before designing a product, designers (we) must carefully consider their intended audience and the purpose of the product. The product must fulfil the design criteria and be fully functioning.

- We will evaluate our product to make changes to its effectiveness and design to improve it.

Our Key Vocabulary:

Word	Meaning
Design	Design is developing, planning and communicating your ideas about what you intend to make.
Make	To work with tools, equipment, materials, ingredients, and components to make quality products and dishes.
Evaluate	To reflect on ideas and products against the design criteria.
Design Criteria	The specific and concise requirements that a product must achieve to be successful. This is used to evaluate a product.
Mechanism	The parts that make something work.
Linkage	A system of links that are joined together to make or change movement. A linkage can be used to join two or more levers together.
Lever	A rigid length of material that moves around a fixed point. Pushing or pulling it creates movement.
Pivot	To turn on a central point. Often attached to levers or pulleys. They can be fixed or loose.
Motion	Movement from one place to another.
Functionality	The product can fulfill its practical purpose. It works.
Appealing	The product looks nice. It is attractive or interesting to look at.
Linear movement	Movement that is one way in a straight line.
Reciprocating movement	Movement that is backwards and forwards in a straight line.
Oscillating movement	Movement that is backwards and forwards in an arc or rounded shape.
Audience	Who your design is aimed at and who will use it.
Purpose	The purpose of your design. Why are we making it?

What I already know:

Previously, the children should have learnt about the following bullet points.

- Children have experienced a wide range of pop-up books and other books with moving parts.
- Designed and made pictures or cards with moving or pop-up parts.

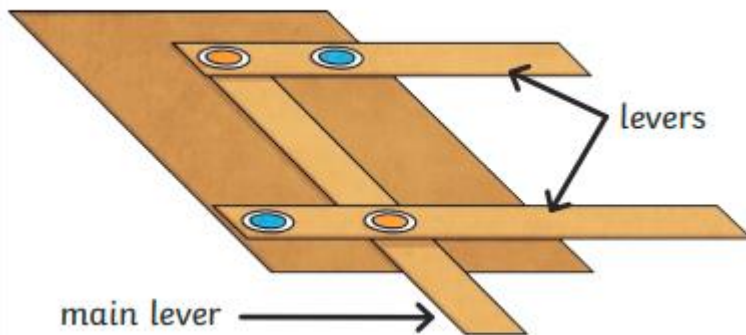
Useful links and websites:

[How do levers work? - KS2 Science - BBC Bitesize](#)

This video is a useful introduction to levers.

[A collection of mechanical toys - KS2 Design and Technology - BBC Bitesize](#)

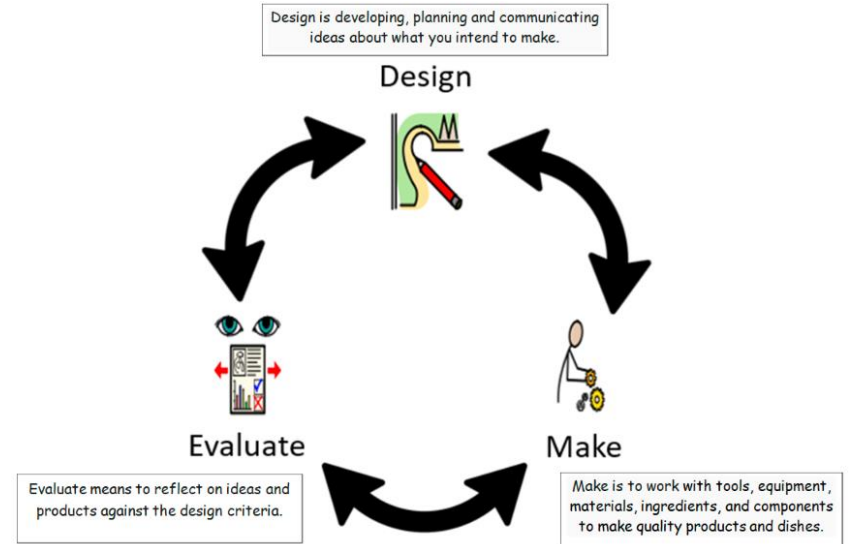
An interesting closer look at what makes toys function without electricity.



When the main level is moved, the linkages will move the two other levers.

The Design, Make and Evaluate Model of Design and Technology:

We will use the Design, Make and Evaluate continuous cycle during every Design and Technology lesson. The cycle shows how we will be constantly evaluating during the design and make stages to improve our products or dishes along our invention journey. As well as evaluating our final product or dish at the end of our long enquiry to conclude what went well, what we would improve next time and what challenges we have faced along the way.



This shows the input and output motions and how they differ. The input motion is controlled by the person and the output motion is when the linkages and levers move because of the force from the input motion.

