

**What does it mean to be strong?**  
**DESIGN TECHNOLOGY**



**National Curriculum Links:**

Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) accurately.  
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 and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].

**Essential Prior Learning:**

Children should have had the opportunity to explore and use mechanisms such as flaps, sliders and levers in familiar contexts, such as books and cards with moving parts.  
They should have had experience of basic cutting, joining and finishing techniques with paper and card.

**Progression in Skill:**

Archimedes was a Greek philosopher, mathematician and inventor who explained how levers work and invented the compound pulley.  
Use the story of the Iron Man as inspiration for project.  
Develop own design criteria of a levered mechanism through discussion, that focuses on the needs of the user.  
Model realistic levered mechanism ideas through discussion, annotated sketches and prototypes.  
Decide on the aesthetic qualities of your mechanism - what you want it to look like.  
Understand that different mechanisms produce different types of movement.  
Order the main stages of making your mechanism.  
Select and use appropriate tools (scissors, craft knives, split pins, glue, Sellotape, paper puncher) with some

accuracy to cut, shape and join paper and card so that the lever makes the mechanism move.  
Select from and use finishing techniques (painting, colouring) suitable for the mechanism.

Investigate books and other products that use levers and linkages:

- What acts as the lever?
- What acts as the linkage?
- Which part of the system is the input, and which is the output?
- What are the best materials for this?
- Understand that different mechanisms produce different types of movement.

Evaluate their own mechanism against design criteria and the user's needs as they design and make.

**Long-term Memory Knowledge:**

Know who Archimedes was and why he is important.  
Talk about how stories can inspire design technology.  
After discussion, develop design criteria for a levered mechanism, focusing on the needs of the user.  
Use discussion, annotated sketches and prototypes to try out different ideas.  
Make decisions about what the final piece should look like.  
Name some different mechanisms and the different sorts of movement they produce.  
Order the stages of the making process.  
Choose the most appropriate tools for the project so that the end result is functional.  
Select appropriate ways to finish the product, e.g. painting.  
In pre-made products, identify levers and linkages, as well as the input and output in each system.  
Evaluate the finished product against the design criteria.

**Key Vocabulary**

<b>mechanism</b>	a device used to create movement in a product
<b>system</b>	systems have an input, process and an output; in a lever and linkage

	mechanism, the 'input movement' is where the user pushes or pulls a card strip; the 'output movement' is where one or more parts of the picture move.
<b>slot</b>	the hole through which a lever is placed so that part of a picture moves
<b>guide or bridge</b>	a short card strip used to keep lever and linkage mechanisms in place and control movement
<b>input</b>	the motion used to start a mechanism
<b>output</b>	the motion that happens as a result of the input
<b>linear</b>	movement in a straight line
<b>rotary</b>	circular movement, e.g. a wheel
<b>oscillating</b>	backwards and forwards movement in an arc e.g. a lever
<b>reciprocating</b>	backwards and forwards movement in a straight line e.g. a slider

**Progression in Resources:**

Books with levers and linkages, scissors, craft knives, split pins, glue, Sellotape, paper puncher

**Relevance**

<b>Now</b>	Develop a way to make products with moving parts, applying this to their own creations.
<b>Future</b>	Have a greater understanding of mechanisms and are more able to fix things when broken rather than needing to replace.
<b>Aspiration</b>	Children may be inspired to pursue a career in Design Technology or Science; they enjoy model making and building as a hobby.