

**Opportunities for teaching Diversity, Equality & Cultural Capital:**  
 Visit the old Skinningrove mine at Loftus. Visit the Sirius mine.

**DT Knowledge Organiser – Pulleys & Levers**

**Lower KS2: Year 4**



**Recall and Remember:**

Simple Mechanisms are the parts that make something work.

Mechanisms are all around us! Most objects that help us in our lives are made up of different mechanisms.

Pulleys and Levers are mechanisms that make things move.

Pulleys use a wheel with a groove along its edge that holds a rope or cable. Pulleys can be used to affect the speed, direction or force of a movement.





Levers use a fulcrum (a fixed point around which the lever can pivot) to make things move in arc (curve).

**Can you name 2 examples of where pulleys are used?**

**Can you name 2 examples of where levers are used?**

**What you will have learnt by the end of this unit.**

- ❖ To develop design criteria, based on research, to design functional, appealing products aimed at individuals or groups
- ❖ To select from a wide range of tools and materials to ensure a high-quality finish
- ❖ To consider the views of others to evaluate their work and make improvements based on this

**What you have already learnt in Yr3.**

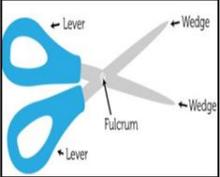
- To apply understanding of how to strengthen, stiffen and reinforce more complex structures
- To use simple research methods to inform the design of products
- To select from a wider range of tools and equipment to perform practical tasks with increasing accuracy
- To select from and use a wider range of materials and components according to their properties
- To evaluate their ideas and products against their own design criteria to make improvements

**Key Knowledge about Pulleys & Levers**

A flag being raised/ lowered on a flagpole is an example of a pulley mechanism. The rope pulled by the user fits into a groove in wheels at the top and bottom of the flagpole. This changes the direction of the force needed to lift/ lower the flag up and down the post.

Seesaws & scissors are examples of simple lever mechanisms. Seesaws are a narrow board supported by a fulcrum in the middle between the two ends. As one end goes up, the other comes down!

Scissors have two fixed levers – [handles] which are squeezed at one end of the levers, so the blades come together at the other end.

### Key Designing Skills I will learn/use:

You need to think about who or what your product is for – what is its purpose and who is going to use it?

Effective pulleys and levers should move smoothly

**Levers:** Consider what material to use for your lever and where you will position the fulcrum. The further it is from the object, the more that the subject at the end of your lever can move!

**Pulleys:** Think about the purpose of your pulley – does it need a container? Will it need a frame? Will it include one or two wheels? How is your pulley going to be operated, by hand or using a weight?

### Key Vocabulary

Mechanism	A set of related parts used to create movement
Lever	A rigid bar resting on a pivot, used to move a heavy load with one end when pressure is applied to the other.
Fulcrum / pivot	The point on which a lever turns or is supported.
Pulley	A grooved wheel over which a drive belt (cable) can run
Drive belt	A cable which connects and transfers movement between the force and the load
Axle	The horizontal shaft that holds a pulley wheel
Horizontal	Flat or level, parallel to the ground
Vertical	In an upright position
Design	To plan a project to make a new structure or product.
Experiment	Try out new ideas and methods.
Technique	Use a particular method or skill.
Develop	Show improvement and change.
Evaluate	Express an opinion of the merits and faults of a final product.
Present	Show & demonstrate a piece of work so it can be appreciated by an audience.

### Key Building & Evaluating Skills I will learn/use:

#### Building:

Think about the skills you will need to use (e.g. cutting, assembling sticking) and the tools that you will need for them (e.g. scissors, glue).

Think about the materials you are going to use – are they strong enough?

Think about finishing techniques

Remember your purpose – does it work?

#### Evaluating:

How well does your mechanism work? Does it move smoothly?

Does it meet its purpose?

Who would use your mechanism? What would they like about it?

Where did you position the fulcrum/ bridge on your lever?

Did you use one or two wheels for your pulley system?

How did this affect the mechanism?

What could you do to improve your mechanism next time?

### My skills and Knowledge that I may use from other subjects

- How to ensure fair testing – Science.
- How to record detailed measurements - Maths

### What you will have learnt by the end of LKS2.

To use ideas from other people when I am designing?

To produce a plan and explain it?

To evaluate and suggest improvements for my designs?

To evaluate products for both their purpose and appearance?

To explain how I have improved my original design?

To present a product in an interesting way?

To measure accurately?

To persevere and adapt my work when my original ideas do not work?

To suggest improvement to my own work and that of others?