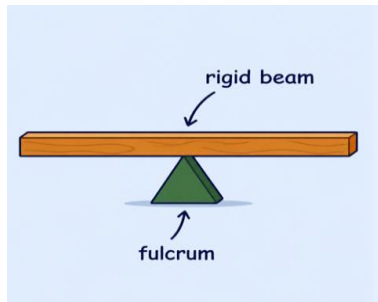


In this unit of work, you will be using the following Design & Technology Skills; You will Sketch ideas clearly to design a cargo loader for a spaceship. You will label mechanisms and explain how your design will work. You will also measure and cut materials accurately, use tools safely (saws, glue guns, scissors), build a strong, stable structure and test and improve your mechanism as you go. You will also evaluate your product against your design criteria and establish what worked well and what you would like to change and why.

What is a Lever?

A **lever** helps you lift or move a load using less effort. Every lever has:

- **Fulcrum** (pivot point)
- **Load** (what you want to move)
- **Effort** (your force)



Three Classes of Levers

1. **Class 1** - Fulcrum in the middle (e.g., seesaw, scissors)



scissors)

2. **Class 2** - Load in the middle (e.g., wheelbarrow, nutcracker)



3. **Class 3** - Effort in the middle (e.g., tweezers, fishing rod)



What is a Pulley?

A **pulley** uses a wheel and rope to lift heavy objects.

Types of Pulleys

Fixed Pulley

Changes the direction of force

You pull down to lift up

Effort stays the same

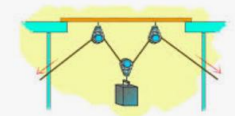


Movable Pulley

Moves with the load

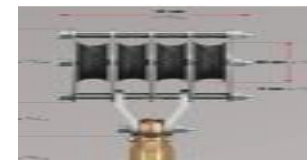
Reduces the effort needed

MOVABLE PULLEYS CONSTRUCTION



Pulley System (Block and Tackle)

- Uses more than one pulley
- Makes lifting even easier



Key Vocabulary

Mechanism - A system of parts working together to make movement easier.

Lever - A rigid bar that moves around a fixed point to lift or move a load.

Fulcrum - The fixed point a lever turns on.

Load - The object you want to move or lift.

Effort - The force you apply to make the lever move.

Pulley - A wheel with a groove that a rope or string fits into, used to lift loads.

Fixed Pulley - A pulley that stays in one place and changes the direction of force.

Movable Pulley - A pulley that moves with the load and reduces the effort needed.

Mechanical Advantage - When a mechanism makes a job easier by reducing the effort needed.

Key Knowledge to Remember

Levers and pulleys help us use **less effort** to move heavy loads.

Changing the position of the **fulcrum** or adding more **pulleys** can make lifting easier.

Good designers test, adapt, and improve their ideas.