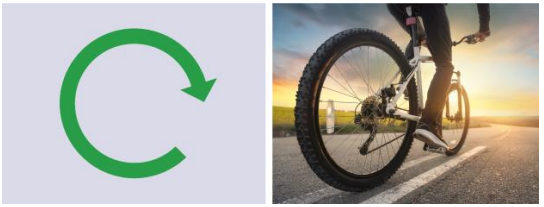
Movement and Mechanisms

Year 7 Knowledge organiser

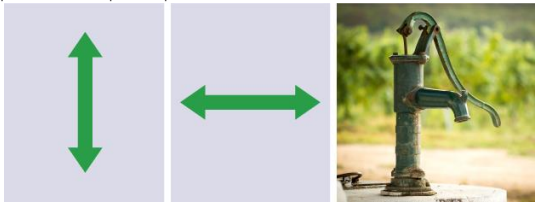
Motion

Linear motion moves something in a straight line, e.g. a train moving down a track:

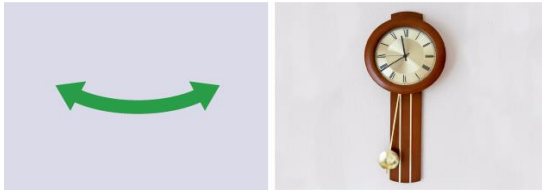
Rotary motion is where something moves around an axis or pivot point, e.g. a wheel



Reciprocating motion has a repeated up and down motion or back-and-forth motion, e.g. a piston or pump:



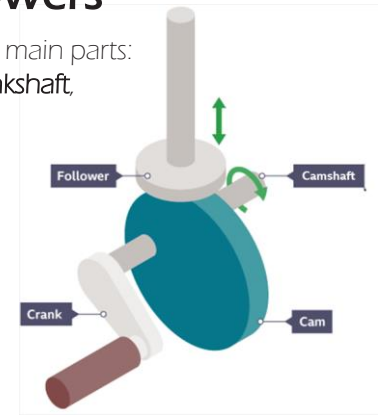
Oscillating motion has a curved backwards and forwards movement that swings on an axis or pivot point, e.g. a swing or a clock pendulum:

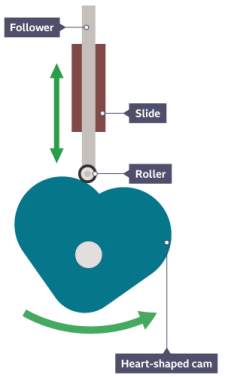


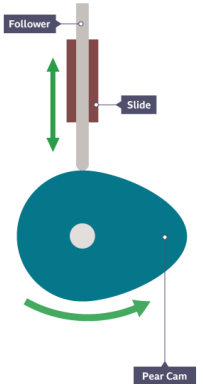
Cams and followers

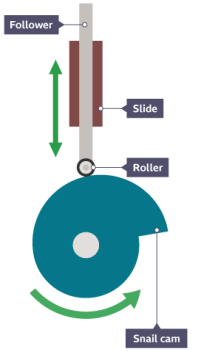
A **cam mechanism** has two main parts:

- a **cam** - attached to a **crankshaft**, which rotates
- a **follower** - touches the cam and follows the shape, moving up and down





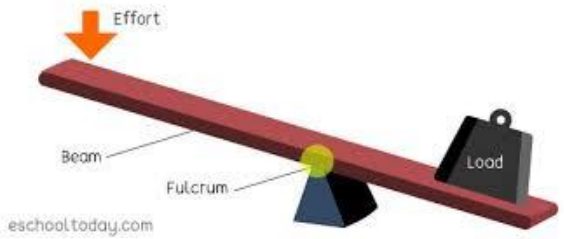


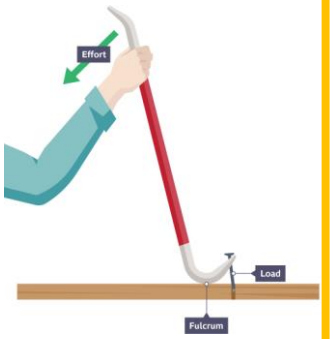


Levers

Levers use **mechanical advantage** to make lifting or applying pressure easier. All **levers** are made of a bar and a **pivot**, called a **fulcrum**. Levers have three main parts:

- **effort** - the amount of force applied by the user, also referred to as the **input**
- **fulcrum** - where the lever pivots
- **load** - the weight that needs to be moved, also referred to as the output



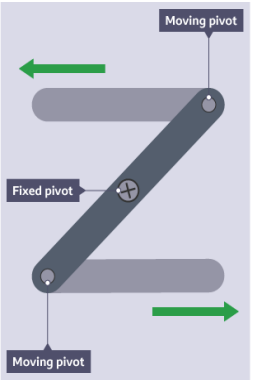


Linkages

Levers can be joined together to form **linkages**. Simple linkages change the direction of motion and the amount of force.

Reverse motion

Reverse motion linkages change the direction of input so that the output goes the opposite way. A fixed **pivot** forces the change in direction. These are often used on foldable clothes horses



Crank and slider

Crank and slider linkages change rotary motion into reciprocating motion. A fixed pivot is attached to a crank, which turns around and pushes and pulls a slider. When used in a car engine, the ignition of petrol by the spark plugs pushes the slider up, moving the connecting rod and turning the crank