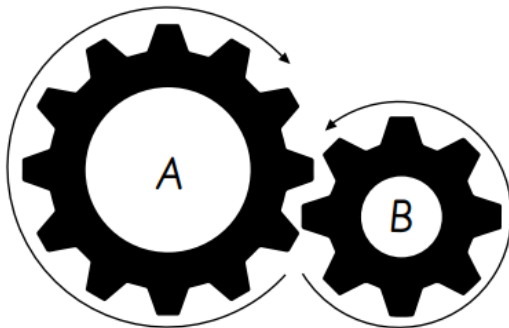


## Knowledge Organiser – Making and designing gear and pulley systems

### Gears

- A **gear** is a wheel with teeth.
- A gear system is multiple gears working together to **transfer** force and motion from one part of a **mechanical system** to another.
- Gears are used to change the speed, direction or force of movement.



An **input** like pedalling a bike causes gear A to rotate.

The teeth of gear A and gear B mesh together. If gear A is turned, it causes gear B to turn.

Gear B causes an **output** like the wheels on a bike spinning.

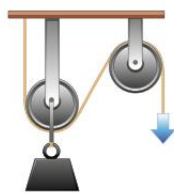
- **Speed:** larger gears (A) turn more slowly than smaller gears (B).
- **Direction:** gears (A and B) turn in opposite directions.
- **Force:** a larger gear (A) turning a smaller gear (B) requires less force while a smaller gear (B) turning a larger gear (A) increases the force output.

A **pulley** is a wheel with a groove and a rope or belt that fits into the groove.

A single pulley changes the direction of the input force, making lifting easier.



Multiple pulleys distribute effort over a longer distance, reducing the input force needed.



### Examples

- Escalators.
- Conveyor belts.
- Treadmills.
- Theatre curtain systems.
- Sailboat rigging.
- Cranes.
- Blinds.