

**Things I already know**

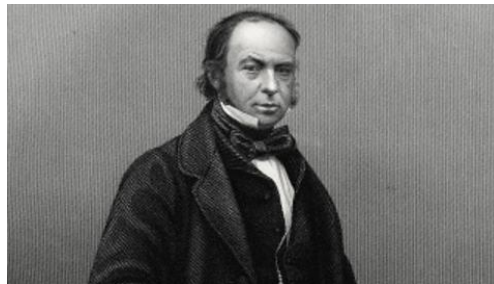
Develop vocabulary related to the project.

- Create shell or frame structures.
- Strengthen frames with diagonal struts.

- ❓ **Gears can change the speed and direction of movement** — large gears turn slower but with more force, while small gears turn faster but with less force.
- ❓ **Pulleys help lift heavy loads more easily** by reducing the effort needed and changing the direction of the force.
- ❓ **Cams convert rotary motion into up-and-down (reciprocating) motion**, which is useful in lifting or pushing mechanisms.
- ❓ **A motor powered by a battery can drive a mechanical system**, turning gears or pulleys to make parts move.
- ❓ **Strong structures need to be reinforced with diagonal struts** to stay stable and support the moving mechanisms safely.

**Questions I Can Answer:** What makes a structure strong and stable enough to support moving parts?

- ❓ **How can I design a structure that works with gears, pulleys or cams to move safely and effectively?**
- ❓ **What techniques will help me build a strong structure and fit my mechanical system accurately?**
- ❓ **How can I test, improve and refine my structure and mechanism so it works better?**

**Significant People:**

*Brunel – Designed bridges and stable structures such as the Clifton suspension bridge.*

**Key Vocabulary**

**Gear** – A toothed wheel that turns to change speed or direction.

**Pulley** – A wheel with a groove that moves a rope or belt to lift things.

**Cam** – A shaped piece that changes circular motion into up-and-down movement.

**Axle** – A rod that a wheel or gear spins around.

**Crank** – A handle that turns a wheel or axle.

**Follower** – A part that moves up and down when pushed by a cam.

**Motor** – A machine that uses electricity to make things move.

**Switch** – A device that turns power on or off.

**Spindle** – A thin rod that turns and holds parts like gears.

**Friction** – A force that slows things down when they rub together.

**Structure** – The frame or body of something that holds it up.

**Circuit** – A path that electricity flows through.

**Crane** – A machine that lifts or moves heavy things.

**Torque** – A turning force that makes something spin

**FRUITS**

*Faith- Encouraging children to persevere and believe in their ideas, even if their first design doesn't work.*

*Respect- Valuing and listening to the ideas of others during peer feedback and collaborative tasks.*

*Uniqueness – Celebrating the diverse ways children approach problem solving and construction.*