Forms of Energy
Energy

Energy is the ability to do work.

Energy exists in various forms: kinetic (mechanical), potential, thermal, chemical, electrical, light, sound, and nuclear. Energy cannot be created or destroyed – only converted from one form to another.
Potential energy

→ the energy an object has because of its position or condition.
→ It is STORED energy
Kinetic energy

→ the energy an object has due to its motion, position, or condition.

It is energy in MOTION.

Anything moving has kinetic energy.
Mechanical energy

→ the total energy of an object due to its motion PLUS its position
→ Energy that does work.

Energy that is moving.
Electrical energy

→ energy that comes from the flow of electricity through a conductor.

Use electricity by:
• plugging a cord into an outlet
• using a battery
• lightning
Chemical energy

→ energy stored in matter that can be released by chemical reactions
Light energy

→ energy that
  • can be seen
  • travels in a straight line
  • move through empty space where there is no air.
Thermal energy

→ the energy from heat
→ The energy created by the movement of molecules causing an object to get hot and release heat.

Also known as heat energy
Sound energy

→ the energy of vibrations carried in waves by air, water, or other matter.

→ energy you can **hear** caused by vibrations (rapid back and forth movement).
Electrical Circuits
Current

A flow of water, air, or electricity.

Water current

Air current

Lightning
Open circuit (incomplete or broken)

An open circuit has a gap in the loop.

→ When a circuit is open, the device will not work.
A closed circuit is a path that allows an uninterrupted, endless path for flow of electricity.

A closed circuit is a continuous loop.

When a circuit is closed, the device works.
Series circuit

All parts of a circuit in a single continuous path

Only **ONE** path for electric current.

If one part breaks, the circuit is broken.
Parallel circuit

All parts of a circuit in **multiple** paths

Two or more paths for electric current

If one part breaks, the circuit **still** works.
Light Energy
Light energy

A form of energy that
• can be seen
• travels in a straight line
• move through empty space where there is no air.
Medium

→ a substance/material that a force acts on or energy is carried (passed) through

3 light mediums:
Transparent: all light passes
Translucent: some light passes
Opaque: no light passes (absorbed)
Interaction

What happens to light when it interacts with a medium?

Light can:
• Transmit
• Reflect
• Refract
• Absorb
Reflect

Light energy that bounces off a surface.

Example: mirror, water surface, tinted windows/glass
Refraction

The bending or breaking of light rays as they pass from one substance to another.

Light slows down and changes direction when it enters a medium.

Example: lens
Transmit

• All light passes through
• Light interaction
• When light comes into contact with a transparent medium

Example: window
Absorb

- Stops or blocks light from passing
- Turns energy into heat
- Happens with opaque mediums
- Example: the color black