Science 10

Unit B: Energy flow in technological systems

Energy transformation technologies

A hand crank lights a lamp

- Turning the crank produces electrical energy that makes the lamp emit light and thermal energy.
- The crank becomes harder to turn when the generator supplies more electrical power.

Function of a generator

- A generator transforms mechanical energy into electrical energy; total energy is conserved.
- Mechanical energy enters; electrical energy carries the transfer; light and thermal energy leave.
- Trace energy transformations in technologies and identify measurable evidence at each step.

Key terms

energy transformation

A change from one energy form to another within a system.

energy transfer

Movement of energy across a system boundary.

generator

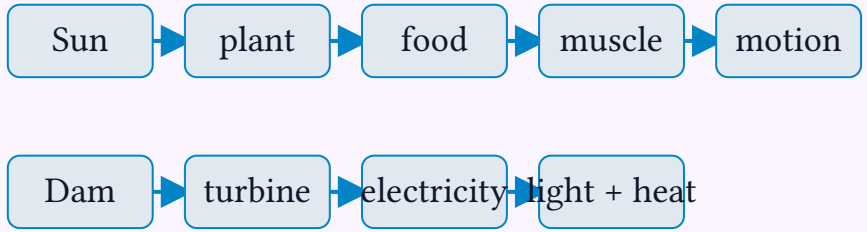
A device that transforms mechanical energy into electrical energy.

turbine

A rotating device driven by moving fluid, such as water, steam, or air.

Transformation technologies

- Hydroelectric and coal generators; solar panels; windmills; fuel cells.
- Transfers produce observable changes in motion, shape, or temperature.

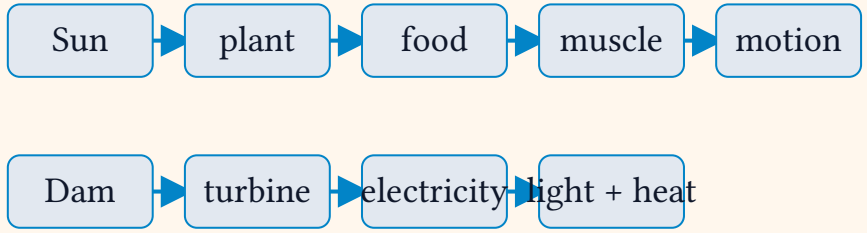


Each step: measurable changes in temperature, motion, or light

Alberta examples: hydro, oil sands upgrading, wind, solar farms

Indigenous technologies

- Tool making, building design, and heating all apply thermodynamic principles.
- Technology and trial-and-error precede formal laws.
- A scraper, a winter dwelling, and a fire each move energy in a way you can describe from the materials.



Each step: measurable changes in temperature, motion, or light

Alberta examples: hydro, oil sands upgrading, wind, solar farms

Technology and society

- Hydro and wind start with a moving fluid and end with electrical energy from a generator.
- A natural-gas plant starts with chemical energy, then combustion, motion, and generation.
- A region may use more than one system because fuel, water, and wind are found in different places.
- The local site changes. The energy accounting stays the same.



Energy chain of a technology

- Draw the energy chain for one technology and label one observable change at each transfer.
- A complete answer names the energy forms in order and cites evidence such as motion, a temperature change, or light.

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