

Science 10 Unit B – Energy

Forms of Energy

Kinetic (E_k)

energy due to motion

$$E_k = \frac{1}{2}mv^2$$

Potential (E_p)

energy due to relative position/condition

gravitational potential energy

$$E_p = mgh$$

Thermal/heat

energy due to temperature difference

Other

Solar

Nuclear

Electrical

Chemical

1-dimensional motion

Scalar

Distance

Speed (distance/time)

Vector

Displacement

Velocity (disp/time)

Acceleration (velocity/time)

Forces required to initiate or stop motion

constant speed (with no acting forces) required no additional energy

$$E_p = W \text{ against gravity}$$

Conversion of energy

changes = presence of energy

Work (W)

$$W = Fd$$

Efficiency

useful changes in energy

protect the environment

and natural resources

Engine, thermodynamics history

engines and research before the two laws

trial and error, efficiency increased over time

current and past technologies for energy transformation

observation of heat... Joule

Key Attitudes

show interest in science

personal career

appreciate interactions & relationships

apply evidence related to investigations

work collaboratively

solve problems

demonstrate sensitivity and responsibility to humans and environment

Show concerns for safety in planning

Ask questions

Key Skills

design experiment

and build it
troubleshoot and resolve

conduct investigations

analyze data

mathematically & graphically

work as a team