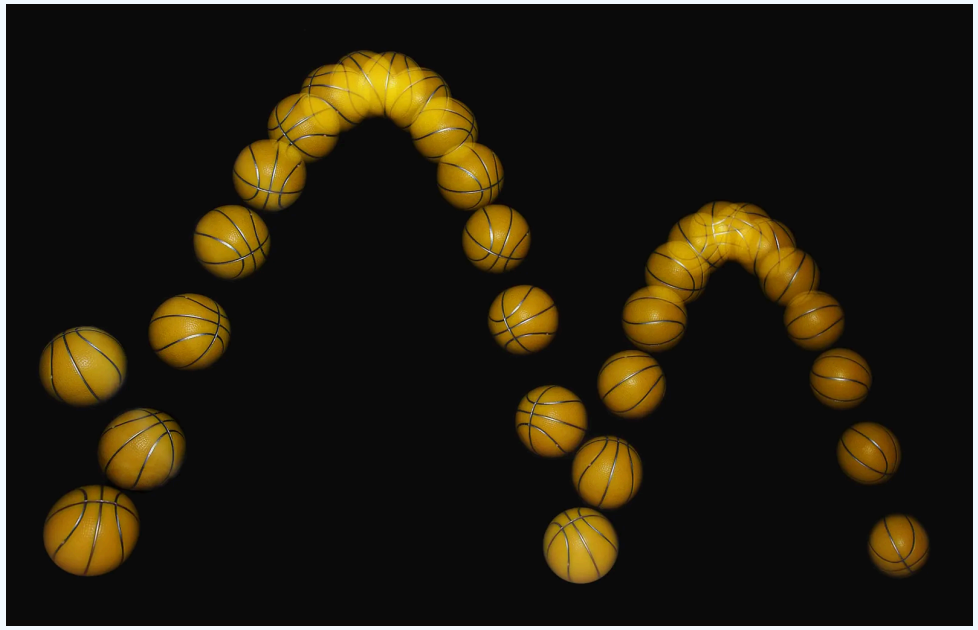
Science 10

Unit B: Energy flow in technological systems

Kinetic and potential energy

A ball at rest and in motion

- A ball held still above the floor has gravitational potential energy.
- After release, its speed increases as gravitational potential energy is transformed into kinetic energy.



Energy definitions

- In the opening case, the held ball has gravitational potential energy because of its height, even while it sits still.
- As the ball falls, gravitational potential energy decreases and kinetic energy increases.
- Above the floor, the moving ball has both.
- Food, batteries, and gasoline store chemical energy because reactions can change their particle arrangements.

Key terms

kinetic energy

Energy associated with an object's motion. (KE or E_k)

potential energy

Energy associated with position, arrangement, or condition. (PE or E_p)

chemical energy

Potential energy associated with the arrangement of atoms and bonds.

system

The object or group of objects chosen for an energy analysis.

Evidence of energy

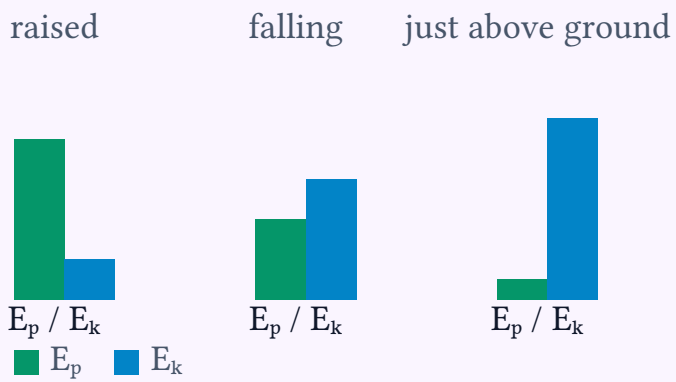
- You infer energy from a change you can measure.
- A change in speed supports a kinetic-energy description. A change in height or shape supports potential energy.
- Temperature, light, sound, or a new substance can show that energy moved or changed form.
- The evidence comes from what you observe. A battery might be charged, flat, or disconnected.



Energy is inferred from observable changes, not seen directly

Applying the energy definitions

- A rolling cart has kinetic energy (KE or E_k) because it is moving.
- A raised cart has gravitational potential energy (a form of PE or E_p) because of its height relative to the floor.
- Food, batteries, and gasoline have chemical energy because their particle arrangements can change during reactions.



Classifying with reasons

- Classify four scenarios and cite the observation or condition that supports each choice.
- A complete answer uses motion for kinetic energy, position or condition for potential energy, and chemical change for chemical energy.

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