

Work and Energy

Chapter 2: Work and Energy · Topic 1

Key Concept

Work is calculated as force multiplied by displacement in the direction of force ($W=F \times s$), measured in joules.

Kinetic energy, the energy of motion, is calculated as $\frac{1}{2}mv^2$, depending on an object's mass and velocity.

Potential energy, stored energy due to position, is calculated as mgh for gravitational potential energy, depending on height.

The law of conservation of energy states that energy cannot be created or destroyed, only transformed from one form to another.

Quick Revision Notes

- Work = force $\times$ displacement ($W=F \times s$).
- Measured in joules.
- Kinetic energy = $\frac{1}{2}mv^2$ (motion energy).
- Depends on mass, velocity.
- Potential energy = mgh (stored, positional).
- Gravitational PE depends on height.
- Conservation of energy: can't create/destroy.
- Energy only transforms between forms.

Practice Questions

- 1 Calculate work done by a 15N force over 4m.
- 2 Calculate kinetic energy of a 3kg object at 4m/s.
- 3 Calculate potential energy of a 5kg object at 8m height.
- 4 Discuss energy conservation with an example.
- 5 Discuss the relationship between work and energy.
- 6 Explain kinetic and potential energy in your own words.