

Work, Energy and Power

Chapter 2: Work, Energy and Power · Topic 1

Key Concept

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

Energy is the capacity to do work, existing in forms like kinetic energy ($\frac{1}{2}mv^2$) and potential energy (mgh).

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

Power is the rate of doing work, calculated as $P = W/t$, measured in watts, showing how quickly work is performed.

Quick Revision Notes

- Work = force $\times$ displacement ($W = F \times s$).
- Measured in joules.
- Energy is the capacity to do work.
- Kinetic energy = $\frac{1}{2}mv^2$; Potential energy = mgh .
- Energy conservation: cannot be created/destroyed.
- It only transforms between forms.
- Power = work $\div$ time ($P = W/t$).
- Power is measured in watts.

Practice Questions

- 1 Calculate the work done by a 20N force over 5m.
- 2 Calculate the kinetic energy of a 2kg object moving at 3m/s.
- 3 Calculate the potential energy of a 5kg object at 10m height.
- 4 Calculate the power if 100J of work is done in 5 seconds.
- 5 Discuss the conservation of energy with an example.
- 6 Explain the relationship between work, energy and power.