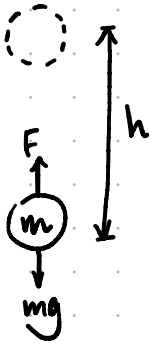
Work, Energy and Power ⚡

Work = force × distance [Nm] or [J] joules

to lift something:



$F = mg$

equation for GPE

$work = f \times d = mgh = GPE$

Types of energy

Kinetic Energy

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

energy of movement

Potential Energy

"stored" energy

→ GPE is 1 type of potential energy

(Principle of) Conservation of Mechanical Energy

When no external forces (except for gravity / weight) are doing work, sum of potential & kinetic energies is constant

Work-Energy Principle

(e.g. force applied for 10m, ΣE increases by 10F)

Gain in total energy of a particle is the work done to the particle

Loss in total energy of a particle is the work done against a force

(e.g. friction

↓

move 10m against friction, ΣE decreases by 10F)

POWER: rate of work $= \frac{\text{work}}{\text{time}} = \frac{f \times d}{t} = fv$ $[Js^{-1}]$ or $[W]$

What?