

IGCSE Physics (0625) Revision Sheet

Aligned with CAIE Syllabus

<https://igcsegradecalc.site>

Chapter 1: Physical Quantities & Measurement

- **Scalar Quantity** – Has magnitude only.
- **Vector Quantity** – Has magnitude and direction.
- **Density**

$$\rho = \frac{m}{V}$$

ρ = density (kg m^{-3}), m = mass (kg), V = volume (m^3)

Chapter 2: Motion

- **Speed**

$$v = \frac{s}{t}$$

v = speed (m s^{-1}), s = distance (m), t = time (s)

- **Velocity**

$$v = \frac{\text{displacement}}{t}$$

v = velocity (m s^{-1}), displacement = change in position (m), t = time (s)

- **Acceleration**

$$a = \frac{v - u}{t}$$

a = acceleration (m s^{-2}), u = initial velocity (m s^{-1}), v = final velocity (m s^{-1}), t = time (s)

- **Free-Fall Acceleration**

$$g \approx 9.8 \text{ m s}^{-2}$$

g = gravitational field strength

Chapter 3: Mass, Weight & Density

- **Mass** – Amount of matter in an object (kg).
- **Weight**

$$W = mg$$

W = weight (N), m = mass (kg), g = gravitational field strength (N kg^{-1})

- **Gravitational Field Strength**

$$g = \frac{W}{m}$$

g = gravitational field strength (N kg^{-1}), W = weight (N), m = mass (kg)

Chapter 4: Forces

- **Newton's Second Law**

$$F = ma$$

F = force (N), m = mass (kg), a = acceleration (m s^{-2})

- **Hooke's Law**

$$F = kx$$

F = force (N), k = spring constant (N m^{-1}), x = extension (m)

- **Moment**

$$M = Fd$$

M = moment (Nm), F = force (N), d = perpendicular distance (m)

Chapter 5: Momentum

- **Momentum**

$$p = mv$$

p = momentum (kg m s^{-1}), m = mass (kg), v = velocity (m s^{-1})

- **Impulse**

$$F\Delta t = \Delta p$$

F = force (N), Δt = time interval (s), Δp = change in momentum

Chapter 6: Energy, Work & Power

- **Work Done**

$$W = Fs$$

W = work done (J), F = force (N), s = distance moved (m)

- **Kinetic Energy**

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

E_k = kinetic energy (J), m = mass (kg), v = speed (m s^{-1})

- **Gravitational Potential Energy**

$$E_p = mgh$$

E_p = potential energy (J), m = mass (kg), g = gravitational field strength (N kg^{-1}), h = height gained (m)

- **Power**

$$P = \frac{W}{t}$$

P = power (W), W = work done (J), t = time (s)

- **Efficiency**

$$\text{Efficiency} = \frac{\text{Useful Output}}{\text{Total Input}} \times 100\%$$

Chapter 7: Pressure

- **Pressure**

$$p = \frac{F}{A}$$

p = pressure (Pa), F = force (N), A = area (m^2)

- **Liquid Pressure**

$$p = \rho gh$$

p = pressure (Pa), ρ = density (kg m^{-3}), g = gravitational field strength (N kg^{-1}), h = depth (m)

Chapter 8: Thermal Physics

- **Specific Heat Capacity**

$$E = mc\Delta T$$

E = thermal energy (J), m = mass (kg), c = specific heat capacity ($\text{J kg}^{-1} \text{K}^{-1}$), ΔT = temperature change (K or $^{\circ}\text{C}$)

- **Specific Latent Heat**

$$E = mL$$

E = thermal energy (J), m = mass (kg), L = specific latent heat (J kg^{-1})

Chapter 9: Waves

- **Wave Equation**

$$v = f\lambda$$

v = wave speed (m s^{-1}), f = frequency (Hz), λ = wavelength (m)

- **Frequency and Period**

$$f = \frac{1}{T}$$

f = frequency (Hz), T = period (s)

Chapter 10: Light

- **Reflection**

$$i = r$$

i = angle of incidence, r = angle of reflection

- **Refractive Index**

$$n = \frac{\sin i}{\sin r}$$

n = refractive index, i = angle of incidence, r = angle of refraction

Chapter 11: Electricity

- **Charge**

$$Q = It$$

Q = charge (C), I = current (A), t = time (s)

- **Potential Difference**

$$V = \frac{E}{Q}$$

V = voltage (V), E = energy (J), Q = charge (C)

- **Resistance**

$$R = \frac{V}{I}$$

R = resistance (Ω), V = voltage (V), I = current (A)

- **Electrical Power**

$$P = VI$$

P = power (W), V = voltage (V), I = current (A)

Chapter 12: Electric Circuits

- **Series Resistance**

$$R_T = R_1 + R_2 + \dots$$

R_T = total resistance (Ω), R_1, R_2 = individual resistances (Ω)

- **Parallel Resistance**

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \dots$$

R_T = total resistance (Ω), R_1, R_2 = individual resistances (Ω)

Chapter 13: Magnetism & Electromagnetism

- **Transformer Equation**

$$\frac{V_p}{V_s} = \frac{N_p}{N_s}$$

V_p = primary voltage (V), V_s = secondary voltage (V), N_p = primary turns, N_s = secondary turns

- **Power Loss in Transmission**

$$P = I^2 R$$

P = power loss (W), I = current (A), R = resistance (Ω)

Chapter 14: Radioactivity

- **Alpha Particle (α)** – Helium nucleus, ${}^4_2\text{He}^{2+}$.
- **Beta Particle (β)** – Fast-moving electron, ${}^0_{-1}\text{e}$.
- **Gamma Ray (γ)** – Electromagnetic radiation, no charge or mass.
- **Half-Life** – Time taken for the activity to decrease by half.
- **Nuclear Fission** – Splitting of a heavy nucleus into lighter nuclei, releasing energy.
- **Nuclear Fusion** – Joining of light nuclei to form a heavier nucleus, releasing energy.