Edexcel GCSE Physics

Topic 1: Key Concepts of Physics

Notes

(Content in bold is for Higher Tier only)

Key Concepts of Physics

SI Units

- Metre, m
- Kilogram, kg
- Second, s
- Ampere, A
- Kelvin, K
- Mole, mol
- Volt, V
- Frequency, hertz, Hz
- Force, newton, N
- Energy, joule, J
- Power, watt, W
- Pressure, pascal, Pa
- Charge, coulomb, C
- Resistance, ohm, Ω
- Magnetic Flux Density, tesla, T

Prefixes

giga	G	x 10^9	1 billion
mega	M	x 10^6	1 million
kilo	k	x 10^3	1 thousand
centi	c	x 10^{-2}	1 hundredth
mili	m	x 10^{-3}	1 thousandth
micro	μ	x 10^{-6}	1 millionth
nano	n	x 10^{-9}	1 billionth

Equations to Learn

$$\text{distance} = \text{speed} \times \text{time}$$

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

$$F = ma$$

$$\text{weight} = mg$$

$$\Delta GPE = mg\Delta h$$

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

$$\text{efficiency} = \frac{\text{usefully energy output}}{\text{total energy input}}$$

$$\text{wave speed} = v = f\lambda$$

$$\text{wave speed} = v = \frac{x}{t}$$

$$\text{work done} = \text{force} \times \text{distance (moved in the direction of the force)} = E = Fd$$

$$\text{Power} = \frac{\text{work done}}{\text{time}} = \frac{\text{energy transferred}}{\text{time taken}}$$

$$\text{Moment of force} = \text{force} \times \text{perpendicular distance}$$

$$\text{energy transferred} = \text{charge moved} \times \text{pd} = E = QV$$

$$\text{charge} = \text{current} \times \text{time} = Q = It$$

$$\text{Voltage} = \text{Current} \times \text{Resistance} = V = IR$$

$$\text{Electrical Power} = \text{current} \times \text{pd} = P = IV$$

$$\text{Electrical power} = \text{current}^2 \times \text{resistance} = P = I^2R$$

$$\text{density} = \frac{\text{mass}}{\text{volume}} = \rho = \frac{m}{V}$$

$$\text{force on spring} = \text{spring constant} \times \text{extension} = F = k\Delta x$$

$$\text{pressure} = \frac{\text{force}}{\text{area}} = P = \frac{F}{A}$$

Equations Given

$$\text{energy transferred} = IVt$$

$$\frac{\text{pd across primary}}{\text{pd across secondary}} = \frac{\text{number of turns in primary}}{\text{number of turns in secondary}} = \frac{V_p}{V_s} = \frac{N_p}{N_s}$$

$$\text{power of primary} = \text{power of secondary} = V_p \times I_p = V_s \times I_s$$

$$\text{change in energy} = \text{mass} \times \text{specific heat capacity} \times \text{temp change} = \Delta Q = mc\Delta\theta$$

$$\text{energy} = \text{mass} \times \text{specific latent heat} = Q = ml$$

$$\text{pressure and volume change} = P_1V_1 = P_2V_2$$

$$\text{energy transferred} = \frac{1}{2}k(\Delta x)^2$$

$$v^2 - u^2 = 2as$$

Higher

$$\textbf{force on a conductor} = \textbf{magnetic flux density} \times \textbf{current} \times \textbf{length} = \mathbf{F = BIl}$$

$$\textbf{pressure from liquid} = \textbf{height of column} \times \textbf{density of liquid} \times \textbf{gravity} = \mathbf{P = h\rho g}$$

$$\textbf{momentum} = \mathbf{p = mv}$$

$$\mathbf{F} = \frac{\mathbf{mv - mu}}{\mathbf{t}}$$