A PHYSICS ALPHABET
ABBREVIATIONS USED IN THIS BOOK, UNITS AND FORMULAE[1]

Quantity (with symbol)		Unit
Area (e.g. surface area)	A	m^2
Acceleration	a	m/s^2
Specific heat capacity	c	J/(kg °C)
Critical angle	i_c	°
Speed of light	c	m/s
Energy	E	J = Nm
Force	F	N = kg m/s^2
Frequency	f	Hz = 1/s
Focal length (of lens)	f	m
Gravitational field strength	g	m/s^2 or N/kg
Height	h	m
Current	I	A
Angle of incidence	i	°
Intensity	I	W/m^2
Spring constant	k	N/m
Specific latent heat	L	J/kg
Mass	m	kg
Number of turns on coil	N	
Refractive index	n	
Momentum	p	kg m/s or Ns

Quantity (with symbol)		Unit
Pressure	p	Pa = N/m^2
Power	P	W = J/s
Power (of lens)	P	D = 1/m
Charge	Q	C = As
Radius	r	m
Resistance	R	Ω = V/A
Angle of refraction	r	°
Distance or displacement	s	m
Time	t	s
Temperature	T	°C or K
Time period	T	s
Object distance (lens)	u	m
Speed before change	u	m/s
Speed or velocity	v	m/s
Image distance (lens)	v	m
Voltage	V	V = J/C
Volume	V	m^3
Weight	W	N = kg m/s^2
Extension	x	m
Wavelength	λ	m
Density	ρ	kg/m^3

1 km = 1000 m	1 Mm = 10^6 m	1 Gm = 10^9 m	
1 cm = 0.01 m	1 mm = 0.001 m	1 μm = 10^{-6} m	1 nm = 10^{-9} m

Units with powers. Note for example:
cm^2 means 1 cm × 1 cm = 0.01 m × 0.01 m = 10^{-4} m^2

[1] A list of formulae and data is given on the inside back cover.

FORMULAE AND DATA[2]

The meaning of all symbols in the formulae, and the units used, are given on the inside of the cover. If you need to revise a formula, turn to the page listed alongside it in this table.

Velocity and Acceleration	
$s = vt$	P 20
$v - u = at$	P 27
Force and Acceleration	
$F = ma$	P 36
Weight	
$W = mg$	P 38
Pressure	
$p = F/A$	P 48
$p = \rho gh$	P 50
Momentum	
$p = mv$	P 55
$p_{\text{after}} - p_{\text{before}} = Ft$	P 58
Circular Motion	
$a = v^2/r$	P 52
$F = mv^2/r$	P 52
Springs and Elastic Deformation	
$F = kx$	P 113
$E = \frac{1}{2}kx^2$	P 115
Energy and Power	
$E = Pt$	P 100
Energy or Work Done	
$E = Fs$	P 100
Kinetic Energy (motion energy)	
$E = \frac{1}{2}mv^2$	P 104
Gravitational Potential Energy	
$E = mgh$	P 101
Energy and Temperature change	
$\Delta Q = mc\Delta T$	P 92
Energy and Change of State	
$Q = mL$	P 95

Efficiency	
efficiency = $\frac{\text{useful energy transferred}}{\text{total energy transferred}}$	P 107
Electricity	
$Q = It$	P 66
$V = IR$	P 73
$P = IV$	P 80
$P = V^2/R = I^2R$	P 82
$E = Pt = IVt$	P 80
Transformers	
$\frac{V_s}{V_p} = \frac{N_s}{N_p}$	P 88
Oscillations	
$f = 1/T$	P 117
Waves	
$v = f\lambda$	P 117
Intensity	
$I = P/A = P/(4\pi r^2)$	P 151
Refractive Index	
$n = c/v$	P 138
Refraction (Snell's Law)	
$n_1 \sin(i) = n_2 \sin(r)$	P 140
Critical Angle	
$\sin(i_c) = 1/n$	P 142
Lenses	
$P = 1/f$	P 145
$1/v = 1/f - 1/u$	P 146
Gases	
$\frac{p_{\text{after}} V_{\text{after}}}{T_{\text{after}}} = \frac{p_{\text{before}} V_{\text{before}}}{T_{\text{before}}}$	P 180
Equivalence of Energy and Mass	
$E = mc^2$	P 165

In the questions on these worksheets, unless otherwise given, take

- **Gravitational field strength (g) as 10 N/kg**
- **Acceleration of a dropped object on Earth without air resistance (g) as 10 m/s^2**
- **Speed of light (c) as 3.00×10^8 m/s (in vacuum)**

Other data will be given on each worksheet when you need it.