Physical Quantities, Symbols and Units

Table 1 below indicates the physical quantities required for numerical calculations that are included in the Access 3 Physics units and the Intermediate 1 Physics units and course together with the SI unit of the quantity.

Table 1

Physical Quantity	Unit
distance	metre
time	second
speed, average speed	metre per second
mass	kilogram
weight	newton
current	ampere
voltage	volt
resistance	ohm
power	watt
input voltage	volt
output voltage	volt
voltage gain	-

Physical Quantities, Symbols and Units

Table 2 below indicates the physical quantities required for numerical calculations that are included in the Standard Grade Physics course together with:

- the symbol used by SQA
- the SI unit of the quantity (and alternative units included in the course)
- the abbreviation for the unit used in Credit level examinations.

In General level examinations full words are used for the units of all physical quantities.

Table 2

Physical Quantity	Symbol	Unit	Unit Abbreviation
distance	d or s	metre light year	m
height	h	metre	m
wavelength	λ	metre	m
amplitude	A	metre	m
time	t	second	s
speed, final speed	v	metre per second	m/s
initial speed	u	metre per second	m/s
change of speed	Δv	metre per second	m/s
average speed	$\bar{v}$	metre per second	m/s
frequency	f	hertz	Hz
acceleration	a	metre per second per second	m/s^2
acceleration due to gravity	g	metre per second per second	m/s^2
gravitational field strength	g	newton per kilogram	N/kg
mass	m	kilogram	kg
weight	W	newton	N
force, thrust	F	newton	N
energy	E	joule kilowatt-hour	J kW h
kinetic energy	E_k	joule	J
potential energy	E_p	joule	J
heat energy	E_h	joule	J
input energy	E_i	joule	J
output energy	E_o	joule	J
work done	W or E_W	joule	J
power	P	watt	W

Physical Quantities, Symbols and Units

Table 2 (cont)

Physical Quantity	Symbol	Unit	Unit Abbreviation
output power	P_o	watt	W
input power	P_i	watt	W
focal length of a lens	f	metre	m
power of a lens	P	dioptre	D
electric charge	Q	coulomb	C
electric current	I	ampere	A
voltage	V	volt	V
resistance	R	ohm	Ω
input voltage	V_i	volt	V
output voltage	V_o	volt	V
voltage gain	A_o or V_{gain}	-	-
power gain	P_{gain}	-	-
primary voltage	V_p	volt	V
secondary voltage	V_s	volt	V
primary current	I_p	ampere	A
secondary current	I_s	ampere	A
number of turns on primary coil	n_p	-	-
number of turns on secondary coil	n_s	-	-
efficiency	(η)	-	-
temperature	T	degree Celsius	°C
specific heat capacity	c	joule per kilogram per degree Celsius	J/kg °C
specific latent heat	l	joule per kilogram	J/kg
activity	A	becquerel	Bq
count rate	-	counts per second (counts per minute)	-
equivalent dose	H	sievert	Sv
half-life	$t_{½}$	second (minute, hour, day, year)	s

Physical Quantities, Symbols and Units

Table 3 below indicates the physical quantities required for numerical calculations that are included in the Intermediate 2 Physics course together with:

- the symbol used by SQA
- the SI unit of the quantity (and alternative units included in the course)
- the abbreviation for the unit used in Intermediate 2 examinations.

Table 3

Physical Quantity	Symbol	Unit	Unit Abbreviation
distance	s or d	metre	m
displacement	s	metre	m
speed, velocity	v	metre per second	m/s
time	t	second	s
change of velocity	Δv	metre per second	m/s
average velocity	$\bar{v}$	metre per second	m/s
initial velocity	u	metre per second	m/s
final velocity	v	metre per second	m/s
acceleration	a	metre per second per second	m/s^2
mass	m	kilogram	kg
weight	W	newton	N
force	F	newton	N
acceleration due to gravity	g	metre per second per second	m/s^2
gravitational field strength	g	newton per kilogram	N/kg
momentum	p	kilogram metre per second	kg m/s
energy	E	joule	J
work done	W or E_W	joule	J
potential energy	E_p	joule	J
height	h	metre	m
kinetic energy	E_k	joule	J
power	P	watt	W
efficiency	(η)	-	-
temperature	T	degree Celsius	°C
specific heat capacity	c	joule per kilogram per degree Celcius	J/kg ˚C
specific latent heat	l	joule per kilogram	J/kg
heat energy	E_h	joule	J

Physical Quantities, Symbols and Units

Table 3 (cont)

Physical Quantity	Symbol	Unit	Unit Abbreviation
electric charge	Q	coulomb	C
electric current	I	ampere	A
voltage, potential difference	V	volt	V
supply voltage	V_s	volt	V
resistance	R	ohm	Ω
total resistance	R_T	ohm	Ω
number of turns on primary coil	n_p	-	-
number of turns on secondary coil	n_s	-	-
primary voltage	V_p	volt	V
secondary voltage	V_s	volt	V
primary current	I_p	ampere	A
secondary current	I_s	ampere	A
input voltage	V_i	volt	V
output voltage	V_o	volt	V
voltage gain	A_o or V_{gain}	-	-
wavelength	λ	metre	m
frequency	f	hertz	Hz
period	T	second	s
amplitude	A	metre	m
angle	θ	degree	°
critical angle	θ_c	degree	°
power (of a lens)	P	dioptre	D
focal length	f	metre	m
activity	A	becquerel	Bq
count rate	-	counts per second (counts per minute)	-
absorbed dose	D	gray	Gy
radiation weighting factor	w_R	-	-
equivalent dose	H	sievert	Sv
half-life	$t_{½}$	second (minute, hour, day, year)	s

Physical Quantities, Symbols and Units

Table 4 below indicates the physical quantities required for numerical calculations that are included in the Higher Physics course together with:

- the symbol used by SQA
- the SI unit of the quantity (and alternative units included in the course)
- the abbreviation for the unit used in Higher examinations.

Table 4

Physical Quantity	Symbol	Unit	Unit Abbreviation
distance	s or d	metre	m
displacement	s	metre	m
speed, velocity	v	metre per second	m s^{-1}
time	t	second	s
change of velocity	Δv	metre per second	m s^{-1}
average velocity	$\bar{v}$	metre per second	m s^{-1}
final velocity	v	metre per second	m s^{-1}
initial velocity	u	metre per second	m s^{-1}
acceleration	a	metre per second per second	m s^{-2}
mass	m	kilogram	kg
weight	W	newton	N
acceleration due to gravity	g	metre per second per second	m s^{-2}
gravitational field strength	g	newton per kilogram	N kg^{-1}
force, tension, upthrust	F	newton	N
momentum	p	kilogram metre per second	kg m s^{-1}
impulse	(Δp)	newton second kilogram metre per second	N s kg m s^{-1}
energy	E	joule	J
work done	W or E_W	joule	J
potential energy	E_p	joule	J
height, depth	h	metre	m
kinetic energy	E_k	joule	J
power	P	watt	W
volume	V	cubic metre	m^3
density	ρ	kilogram per cubic metre	kg m^{-3}
area	A	square metre	m^2
pressure	P or p	pascal	Pa
temperature	T	kelvin degree Celsius	K °C

Physical Quantities, Symbols and Units

Table 4 (cont)

Physical Quantity	Symbol	Unit	Unit Abbreviation
electric charge	Q	coulomb	C
electric current	I	ampere	A
voltage, potential difference	V	volt	V
electromotive force (e.m.f)	E or $\mathcal{E}$	volt	V
internal resistance	r	ohm	Ω
resistance	R	ohm	Ω
peak voltage	V_{peak}	volt	V
root mean square voltage	V_{rms}	volt	V
peak current	I_{peak}	ampere	A
root mean square current	I_{rms}	ampere	A
capacitance	C	farad	F
input voltage	V_1 or V_2	volt	V
output voltage	V_o	volt	V
feedback resistance	R_f	ohm	Ω
voltage gain	A_o or V_{gain}	-	-
period	T	second	s
frequency	f	hertz	Hz
wavelength	λ	metre	m
angle	θ	degree	°
critical angle	θ_c	degree	°
refractive index	n	-	-
irradiance	I	watt per square metre	W m^{-2}
Planck's constant	h	joule second	J s
number of photons per second	N	-	-
threshold frequency	f_o	hertz	Hz
energy level	W_1, W_2, …	joule	J
speed of light in a vacuum	c	metre per second	m s^{-1}
activity	A	becquerel	Bq
count rate	-	counts per second (counts per minute)	-
number of nuclei decaying in time t	N	-	-
absorbed dose	D	gray	Gy

Physical Quantities, Symbols and Units

Table 4 (cont)

Physical Quantity	Symbol	Unit	Unit Abbreviation
absorbed dose rate	$\dot{D}$	gray per second gray per hour gray per year	Gy s^{-1} Gy h^{-1} Gy y^{-1}
radiation weighting factor	w_R	-	-
equivalent dose	H	sievert	Sv
equivalent dose rate	$\dot{H}$	sievert per second sievert per hour sievert per year	Sv s^{-1} Sv h^{-1} Sv y^{-1}
effective dose	H	sievert	Sv
half-life	$t_{½}$	second (minute, hour, day, year)	s
half-value thickness	$T_{½}$	metre	m

Physical Quantities, Symbols and Units

Table 5 below indicates the physical quantities required for numerical calculations that are included in the Advanced Higher Physics course together with:

- the symbol used by SQA
- the SI unit of the quantity (and alternative units included in the course)
- the abbreviation for the unit used in Advanced Higher examinations.

Table 5

Physical Quantity	Symbol	Unit	Unit Abbreviation
distance, depth, height	d or h	metre	m
displacement	s or x or y	metre	m
length	l	metre	m
radius	r	metre	m
time	t	second	s
initial velocity	u	metre per second	m s^{-1}
speed, velocity, final velocity	v	metre per second	m s^{-1}
acceleration	a	metre per second per second	m s^{-2}
mass	m	kilogram	kg
rest mass	m_o	kilogram	kg
energy	E	joule	J
speed of light in a vacuum	c	metre per second	m s^{-1}
angular displacement	θ	radian	rad
initial angular velocity	ω_o	radian per second	rad s^{-1}
angular velocity, final angular velocity	ω	radian per second	rad s^{-1}
angular acceleration	α	radian per second per second	rad s^{-2}
tangential acceleration	a_t	metre per second per second	m s^{-2}
radial acceleration	a_r	metre per second per second	m s^{-2}
force	F	newton	N
torque	T	newton metre	N m
moment of inertia	I	kilogram metre squared	kg m^2
angular momentum	L	kilogram metre squared per second	kg m^2 s^{-1}
rotational kinetic energy	E_{rot}	joule	J
gravitational field strength	g	newton per kilogram	N kg^{-1}
gravitational potential	U or V	joule per kilogram	J kg^{-1}
gravitational potential energy	E_p	joule	J
amplitude	A	metre	m
angular frequency	ω	(radian per second)	(rad s^{-1})

Physical Quantities, Symbols and Units

Table 5 (cont)

Physical Quantity	Symbol	Unit	Unit Abbreviation
wavelength	λ	metre	m
momentum	p	kilogram metre per second	kg m s^{-1}
electric charge	Q or q	coulomb	C
electric field strength	E	newton per coulomb	N C^{-1}
electrical potential	V	volt	V
potential difference	V	volt	V
electric current	I	ampere	A
magnetic induction	B	tesla	T
angle	θ	degree radian	° rad
induced e.m.f.	E or $\mathcal{E}$	volt	V
self-inductance	L	henry	H
frequency	f	hertz	Hz
period	T	second	s
velocity of source	v_s	metre per second	m s^{-1}
velocity of observer	v_o	metre per second	m s^{-1}
frequency of source	f_s	hertz	Hz
phase angle	Φ	radian	rad
refractive index	n	-	-
fringe separation	Δx	metre	m
slit separation	d	metre	m
grating to screen distance	D	metre	m
polarising angle (Brewster's angle)	i_p	degree	°