Physical Quantities

	Quantity	Definition	Formula	Units	Dimensions
Basic Mechanical	**Length or Distance**	*fundamental*	d	m (meter)	*L (Length)*
	Time	*fundamental*	t	s (second)	*T (Time)*
	Mass	*fundamental*	m	kg (kilogram)	*M (Mass)*
	Area	distance^2	$A = d^2$	m^2	L^2
	Volume	distance^3	$V = d^3$	m^3	L^3
	Density	mass / volume	$d = m/V$	kg/m^3	M/L^3
	Velocity	distance / time	$v = d/t$	m/s c (speed of light)	L/T
	Acceleration	velocity / time	$a = v/t$	m/s^2	L/T^2
	Momentum	mass × velocity	$p = m \cdot v$	kg·m/s	ML/T
	Force Weight	mass × acceleration mass × acceleration of gravity	$F = m \cdot a$ $W = m \cdot g$	N (newton) = kg·m/s^2	ML/T^2
	Pressure or Stress	force / area	$p = F/A$	Pa (pascal) = N/m^2 = kg/(m·s^2)	M/LT^2
	Energy or Work Kinetic Energy Potential Energy	force × distance mass × velocity^2 / 2 mass × acceleration of gravity × height	$E = F \cdot d$ $KE = m \cdot v^2/2$ $PE = m \cdot g \cdot h$	J (joule) = N·m = kg·m^2/s^2	ML^2/T^2
	Power	energy / time	$P = E/t$	W (watt) = J/s = kg·m^2/s^3	ML^2/T^3
	Impulse	force × time	$I = F \cdot t$	N·s = kg·m/s	ML/T
	Action	energy × time momentum × distance	$S = E \cdot t$ $S = p \cdot d$	J·s = kg·m^2/s h (quantum of action)	ML^2/T
Rotational Mechanical	**Angle**	fundamental	θ	° (degree), rad (radian), rev 360° = 2π rad = 1 rev	*dimensionless*
	Cycles	fundamental	n	cyc (cycles)	*dimensionless*
	Frequency	cycles / time	$f = n/t$	Hz (hertz) = cyc/s = 1/s	$1/T$
	Angular Velocity	angle / time	$\omega = \theta/t$	rad/s = 1/s	$1/T$
	Angular Acceleration	angular velocity / time	$\alpha = \omega/t$	rad/s^2 = 1/s^2	$1/T^2$
	Moment of Inertia	mass × radius^2	$I = m \cdot r^2$	kg·m^2	ML^2
	Angular Momentum	radius × momentum moment of inertia × angular velocity	$L = r \cdot p$ $L = I \cdot \omega$	J·s = kg·m^2/s ħ (quantum of angular momentum)	ML^2/T
	Torque or Moment	radius × force moment of inertia × angular acceleration	$\tau = r \cdot F$ $\tau = I \cdot \alpha$	N·m = kg·m^2/s^2	ML^2/T^2
Thermal	**Temperature**	fundamental	T	°C (celsius), K (kelvin)	*K (Temp.)*
	Heat	heat energy	Q	J (joule) = kg·m^2/s^2	ML^2/T^2
	Entropy	heat / temperature	$S = Q/T$	J/K	ML^2/T^2K
Electromagnetic	**Electric Charge +/−**	fundamental	q	C (coulomb) e (elementary charge)	*Q (Charge)*
	Current	charge / time	$i = q/t$	A (amp) = C/s	Q/T
	Voltage or Potential	energy / charge	$V = E/q$	V (volt) = J/C	ML^2/QT^2
	Resistance	voltage / current	$R = V/i$	Ω (ohm) = V/A	ML^2/Q^2T
	Capacitance	charge / voltage	$C = q/V$	F (farad) = C/V	Q^2T^2/ML^2
	Inductance	voltage / (current / time)	$L = V/(i/t)$	H (henry) = V·s/A	ML^2/Q^2
	Electric Field	voltage / distance force / charge	$E = V/d$ $E = F/q$	V/m = N/C	ML/QT^2
	Electric Flux	electric field × area	$\Phi_E = E \cdot A$	V·m = N·m^2/C	ML^3/QT^2
	Magnetic Field	force / (charge × velocity)	$B = F/(q \cdot v)$	T (tesla) = Wb/m^2 = N·s/(C·m)	M/QT
	Magnetic Flux	magnetic field × area	$\Phi_M = B \cdot A$	Wb (weber) = V·s = J·s/C	ML^2/QT

Note: Other conventions define different quantities to be fundamental.
Mass, energy, momentum, angular momentum, and charge are conserved, which means the total amount does not change in an isolated system.