

SI, METRICS AND DERIVED UNITS

Physicists use standards for basic units of measurement. These standards allow the physicist to make **precise** measurements that are reproducible and unchanging. Measurements in the scientific world are expressed by the metric or SI systems. The SI system is just a modernized version of the metric system adopted in 1960 and is based on fundamental units. All other units are **derived** from the fundamental units.

International System

Property	Unit	Symbol
length	meter	m
mass	kilogram	kg
time	second	s
temperature	Kelvin	K
electric current	ampere	A
luminous intensity	candela	cd
amount of substance	mole	mol



Metric System

Property	Unit	Symbol
length	meter	m
mass	gram	g
volume	liter	l
time	second	s
temperature	degree Celsius	°C

Prefixes

Both the metric and SI systems are based on the decimal system and make use of prefixes to indicate fractions and multiples of ten. The same prefixes are used with all the units.

Prefix	Symbol	Meaning	Prefix	Symbol	Meaning
tera-	T	10 ¹²	deci-	d	10 ⁻¹
giga-	G	10 ⁹	centi-	c	10 ⁻²
mega-	M	10 ⁶	milli-	m	10 ⁻³
kilo-	k	10 ³	micro-	μ	10 ⁻⁶
hecto-	h	10 ²	nano-	n	10 ⁻⁹
deka-	dk	10 ¹	pico-	p	10 ⁻¹²

Derived Units

Property	Unit	Symbol	Base units
force	newton	N	kg·m/s ²
energy/work	joule	J	kg·m ² /s ²
frequency	hertz	Hz	s ⁻¹
power	watt	W	kg·m ² /s ³
electric charge	coulomb	C	A/s
pressure	pascal	Pa	kg/(m·s ²)