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 1964 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
amount of substance	**mole**	mol
electric current	ampere	A
luminous intensity	candela	cd

Metric System

Property	Unit	Symbol
length	meter	m
mass	gram	g
volume	liter	l
time	second	s

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	Value	Prefix	Symbol	Value
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	$kg{\cdot}m/s^2$
energy/work	**joule**	J	$kg{\cdot}m^2/s^2$
frequency	hertz	Hz	s^{-1}
power	watt	W	$kg{\cdot}m^2/s^3$
electric charge	coulomb	C	A/s
pressure	pascal	Pa	$kg/(m{\cdot}s^2)$