S.I. Metric Modifiers

It is essential that you are able to speak the language of Physics - an important part of this is recognising the prefixes we assign to numbers in order to signify their multiplication factors. In Physics you regularly deal with incredibly large and incredibly small numbers; the use of S.I. prefixes and standard form makes the process of dealing with these far simpler.

You should learn the terms below; make sure that you are able to recall the multiplication factor (e.g. 1MJ = 1×10^6J) and symbol for each of the prefixes listed.

TABLE 1.4 — SI UNIT PREFIXES

Multiplication Factor	SI Prefix	SI Prefix Symbol, Use Roman Type	Pronunciation (U.S.)*	Meaning (U.S.)	Meaning In Other Countries
1 000 000 000 000 000 000 = 10^{18}	exa**	E	ex′ a (*a* as in *a* bout)	one quintillion times†	trillion
1 000 000 000 000 000 = 10^{15}	peta**	P	as in *p* etal	one quadrillion times†	thousand billion
1 000 000 000 000 = 10^{12}	tera	T	as in *terra* ce	one trillion times†	billion
1 000 000 000 = 10^{9}	giga	G	jig′ a (*a* as in *a* bout)	one billion times†	milliard
1 000 000 = 10^{6}	mega	M	as in *mega* phone	one million times	
1 000 = 10^{3}	kilo	k	as in *kilo* watt	one thousand times	
100 = 10^{2}	hecto‡	h	heck′ toe	one hundred times	
10 = 10	deka‡	da	deck′ a (*a* as in *a* bout)	ten times	
0.1 = 10^{-1}	deci‡	d	as in *deci* mal	one tenth of	
0.01 = 10^{-2}	centi‡	c	as in *senti* ment	one hundredth of	
0.001 = 10^{-3}	milli	m	as in *mili* tary	one thousandth of	
0.000 001 = 10^{-6}	micro	μ	as in *micro* phone	one millionth of	
0.000 000 001 = 10^{-9}	nano	n	nan′ oh (*an* as in *an* t)	one billionth of†	milliardth
0.000 000 000 001 = 10^{-12}	pico	p	peek′ oh	one trillionth of†	billionth
0.000 000 000 000 001 = 10^{-15}	femto	f	fem′ toe (*fem* as in *fem* inine)	one quadrillionth of†	thousand billionth
0.000 000 000 000 000 001 = 10^{-18}	atto	a	as in ana*to* my	one quintillionth of†	trillionth

Table credit: The SI Metric System of Units and SPE Metric Standard - Society of Petroleum Engineers

In addition, you should also be able to quote the units of quantities confidently. You may know many of these already, but you should learn these if not:

Quantity	Unit	Symbol
Mass	Kilogram	kg
Energy	Joules	J
Velocity	Metres per Second	m/s or ms^{-1}
Acceleration	Meters per Second per Second	m/s^2 or ms^{-2}
Distance	Metres	m
Frequency	Hertz	Hz
Time	Second	s
Force	Newton	N
Potential Difference	Volt	V
Current	Ampere	A
Resistance	Ohm	Ω
Charge	Coulomb	C
Wavelength	Metre	m
Volume	Metres cubed	m^3
Area	Metres squared	m^2
Amount of substance	Mole	mol
Power	Watt	W
Temperature	Kelvin	K