

Mr. Heinrich/Mr. Flock
 R.O.W.V.A. High School
 Oneida, IL 61467
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Systeme International Units

The Systeme International (French for International System) is the standard of measurement for scientists across the world. It is extremely important that when we are comparing data and making conclusions we use the same units otherwise our conclusions will be inconsistent. Inconsistent usage of units could cost you up to \$125 million*. Listed below are the base units on which all the Systeme International measurements are based. In addition, the prefixes for adjusting the scale of the base units and some examples of commonly used units and their base compositions.

Quantity	Unit	Abbreviation	English Conversion
Length	meter	m	1 in = 2.54 cm (exact)
Time	seconds	s	same
Mass	kilograms	kg	1 kg = 2.20 lb (where $g = 9.81 \text{ m/s}^2$)
Electric Current	ampere	A	same
Temperature	kelvin	K	$T_K = (T_F + 459.67) \div 1.8$
Amount of substance	mole	mol	1 mol = 5.0185×10^{22} dozens
Luminous Intensity	candela	cd	about 1 candle's light

Prefix	Abbreviation	Value
exa-	E	10^{18}
peta-	P	10^{15}
tera-	T	10^{12}
giga-	G	10^9
mega-	M	10^6
kilo-	k	10^3
hecto-	h	10^2
deka-	da	10^1
deci-	d	10^{-1}
centi-	c	10^{-2}
milli-	m	10^{-3}
micro-	μ (Greek letter mu)	10^{-6}
nano-	n	10^{-9}
pico-	p	10^{-12}
femto	f	10^{-15}
atto-	a	10^{-18}

Common Complex Units	
Newton (N)	$\text{kg} \cdot \text{m} / \text{s}^2$
Pascal (Pa)	$\text{kg} / (\text{m} \cdot \text{s}^2)$
Hertz (Hz)	s^{-1}
Joule (J)	$\text{kg} \cdot \text{m}^2 / \text{s}^2$
Ohm (Ω)	$\text{kg} \cdot \text{m}^2 / (\text{A}^2 \cdot \text{s}^2)$
Coulomb (C)	$\text{A} \cdot \text{s}$
Tesla (T)	$\text{kg} / (\text{A} \cdot \text{s}^2)$

*September 23, 1999 (Seniors had just started 4th grade, Juniors 3rd grade) NASA lost a Mars Orbiter that had just completed a 10 month journey to Mars and cost \$125 million. The team that built the orbiter in Colorado used metric units while the navigation team in California used English units. This two different unit systems most likely sent the orbiter through the atmosphere where it burned up.