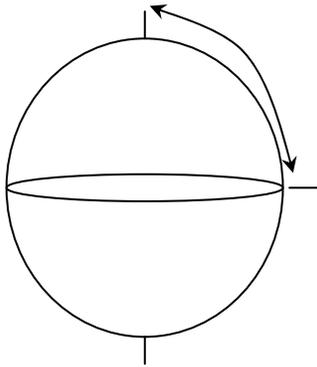


Units of Measure

Systemé International D'Unites -- International System of Units (SI)
1799 – Paris Academy of Sciences

1. Any rational system of weights & measures needs:
 - a. A starting point
 - b. An increment
 - c. Must be reproducible

2. Length – area – volume => METER



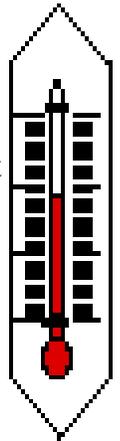
- a. Based on one ten-millionth part of the quadrant of the earth on meridian between Dunkirk and Barcelona.
- b. = 10,000,000 m (or 10,000km)
- c. Kept as a polished platinum bar
- d. As of 1983 “The length of path traveled by light in a vacuum during the time interval of $1/299,792,458$ of a second”

3. Mass => gram

- a. Mass of one cm^3 of pure water at 4°C

4. Temperature => degrees Celsius (Fahrenheit makes no sense)

- a. Anders Celsius (1701-1744) devised scale with 0 at boiling and 100 at freezing – SI reversed it
- b. 0°C = triple-point (freezing) of water (at 1atm), 100°C = boiling point
- c. Actual SI temperature is in “kelvins”
no thermal motion at $0^\circ\text{K} = -273.15^\circ\text{C}$



5. Prefixes

Prefix	value	symbol	example	etymology
Yotta	10^{24}	Y	Yottajoule	from otto, eight italian
Zetta	10^{21}	Z	Zettamole	from sette, seven italian
Exa	10^{18}	E	Exaweber	from hex, six in Greek
Peta	10^{15}	P	PetaHertz	from pente, five in Greek
Tera	10^{12}	T	TeraCandela	teras, monster in Greek
Giga	10^9	G	Gigawatt	gigas, giant in Greek
Mega	10^6	M	Megakelvin	megas, huge in Greek
kilo	10^3	k	kilovolt	khilioi, thousand in Greek
hecto	10^2	h	hectoradian	hekaton, hundred in Greek
Deca/Deka	10	D	Dekapascal	deka, ten in Greek
deci	10^{-1}	d	decisievert	decimus, tenth in Latin
centi	10^{-2}	c	centimetre	centum, hundred in Latin
milli	10^{-3}	m	milliampere	mille, thousand in Latin
micro	10^{-6}	mu	microohm	mikros, small in Greek
nano	10^{-9}	n	nanosecond	nanos, dwarf in Greek
pico	10^{-12}	p	picofarad	pico, little bit in Spanish
femto	10^{-15}	f	femtonewton	femten, 15 in Danish or Norwegian
atto	10^{-18}	a	attogram	atten, 18 in Danish or Norwegian
zepto	10^{-21}	z	zeptohenri	from sept, seven Greek
yocto	10^{-24}	y	yoctolitre	from okto, eight Greek