

Some Things That Everyone Should Know
Order of Magnitude

gravitational acceleration	10 m/s ²
densities of solids and liquids	10 ³ kg/m ³
density of air at sea level	1 kg/m ³
length of day	10 ⁵ s/day
length of the year	$\pi \times 10^7$ s/year
earth's radius	6.4×10^3 km
angle of width of finger at arm's length	1^0 or $\frac{\pi}{180} \approx 1.7 \times 10^{-2}$
thickness of paper	0.1 mm
mass of a paper clip	0.5 gm
heat output per person	70 W
highest mountain, deepest ocean	10 km
earth moon separation	3.8×10^5 km
earth sun separation	1.5×10^8 km
atmospheric pressure	weight of 1 kg/cm ² or a 10 m column of water
Avogadro's number	6×10^{23} atoms/gm mol
\hbar or Planck's constant/ 2π	1×10^{-34} J s or 6.6×10^{-22} MeV s
atomic diameter	10^{-10} m
nuclear diameter	10^{-15} m
atomic masses	$1.6 \times 10^{-27} - 4 \times 10^{-25}$ kg
energy conversion	1 eV $\approx \frac{3}{2} \times 10^{-19}$ J
energy content of a chemical bond	2 - 5 eV
energy content of temperature	10^{-4} eV/°K $\approx 10^{-23}$ J/°K
energy content of food	1 Cal = 10^3 cal and 1 cal ≈ 4 J
charge of the electron	1.6×10^{-19} C
electron mass	10^{-30} kg
ratio of the electron and proton masses	1/2000
speed of light	3×10^8 m/s
Hubble's constant	$\frac{2}{3} \times 10^{-10}$ yr ⁻¹
wavelength of light	6×10^{-7} m
population of the US	3×10^8 people
population of Austin	7×10^5 people
π^2	10
ln 2	0.7
$(1 + x)^n$	$\approx 1 + n x$ for $x \ll 1$
sin x	$\approx x - \frac{x^3}{3!}$ for $x \ll 1$
cos x	$\approx 1 - \frac{x^2}{2!}$ for $x \ll 1$