Physical Science Reference Tables

MOTION AND ENERGY

$\bar{v} = \frac{\Delta d}{\Delta t}$

$a = \frac{v_f - v_i}{\Delta t}$

$F = ma$

$F_g = mg$

$W = F\Delta d$

$P = \frac{W}{\Delta t}$

$PE_g = mgh = F_w h$

$KE = \frac{1}{2}mv^2$

$v_w = f\lambda$

v = velocity

d = position

t = time

a = uniform acceleration

F = force

m = mass

F_g = weight

g = acceleration due gravity on Earth = 9.8 m/s/s

W = work

P = power

PE_g = gravitational potential energy

h = height

KE = kinetic energy

v_w = wave velocity

f = frequency

λ = wavelength

ELECTRICITY

$V = IR$

$P = VI$

V = electrical potential difference

I = current

R = resistance

P = power

DENSITY

$D = \frac{m}{V}$

D = density

m = mass

V = volume

PERIODIC TABLE

1 IA								
1 **H** Hydrogen 1.008	2 IIA							
3 **Li** Lithium 6.941	4 **Be** Beryllium 9.012							
11 **Na** Sodium 22.99	12 **Mg** Magnesium 24.31	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8 VIIIB	9 VIIIB
19 **K** Potassium 39.10	20 **Ca** Calcium 40.08	21 **Sc** Scandium 44.96	22 **Ti** Titanium 47.88	23 **V** Vanadium 50.94	24 **Cr** Chromium 51.99	25 **Mn** Manganese 54.94	26 **Fe** Iron 55.85	27 **Co** Cobalt 58.93
37 **Rb** Rubidium 85.47	38 **Sr** Strontium 87.62	39 **Y** Yttrium 88.91	40 **Zr** Zirconium 91.22	41 **Nb** Niobium 92.91	42 **Mo** Molybdenum 95.94	43 **Tc** Technetium (98)	44 **Ru** Ruthenium 101.07	45 **Rh** Rhodium 102.91
55 **Cs** Cesium 132.91	56 **Ba** Barium 137.38	57 **La** Lanthanum 138.91	72 **Hf** Hafnium 178.49	73 **Ta** Tantalum 180.95	74 **W** Tungsten 183.84	75 **Re** Rhenium 186.21	76 **Os** Osmium 190.23	77 **Ir** Iridium 192.22
87 **Fr** Francium (223)	88 **Ra** Radium (226)	89 **Ac** Actinium (227)	104 **Rf** Rutherfordium (261)	105 **Db** Dubnium (262)	106 **Sg** Seaborgium (263)	107 **Bh** Bohrium (264)	108 **Hs** Hassium (269)	109 **Mt** Meitnerium (268)

58 **Ce** Cerium 140.12	59 **Pr** Praseodymium 140.91	60 **Nd** Neodymium 144.24	61 **Pm** Promethium (145)	62 **Sm** Samarium 150.36	63 **Eu** Europium 151.96	64 **Gd** Gadolinium 157.25
90 **Th** Thorium 232.04	91 **Pa** Protactinium 231.04	92 **U** Uranium 238.04	93 **Np** Neptunium (237)	94 **Pu** Plutonium (244)	95 **Am** Americium (243)	96 **Cm** Curium (247)

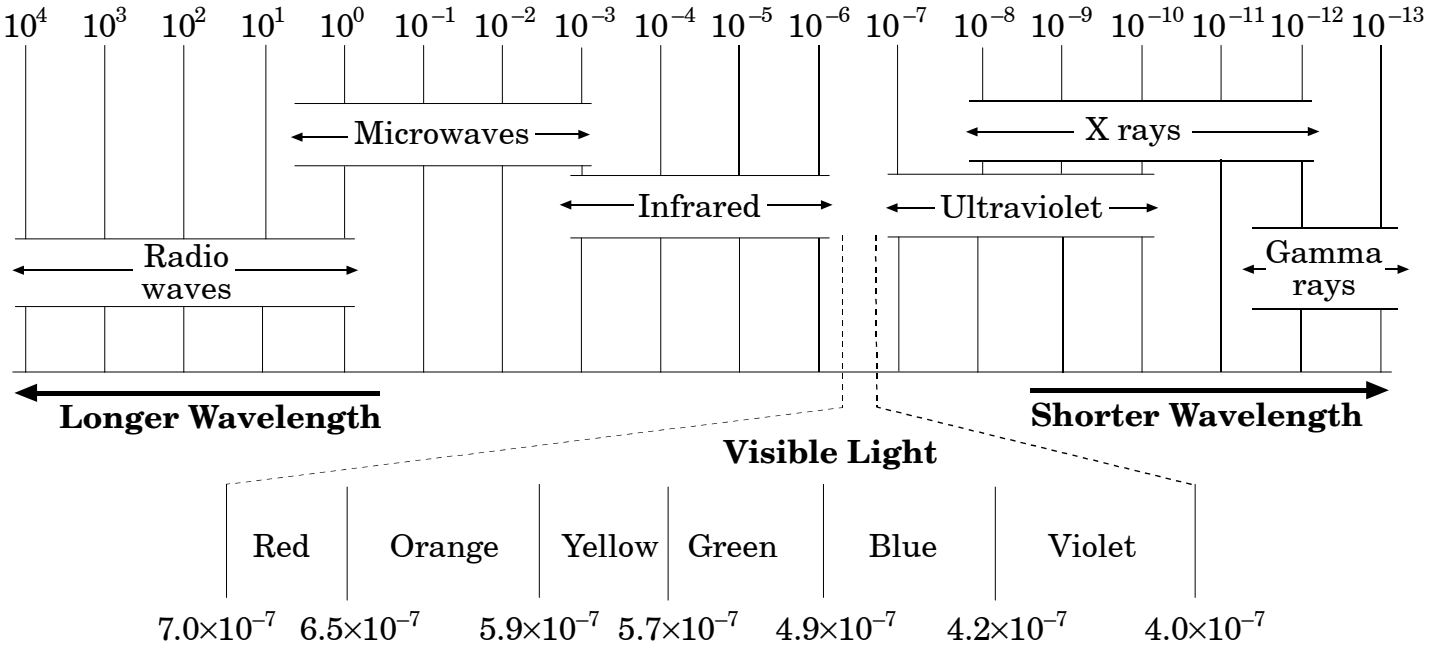
OF THE ELEMENTS

							18 VIIIA
			13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	2 **He** Helium 4.003
			5 **B** Boron 10.81	6 **C** Carbon 12.01	7 **N** Nitrogen 14.01	8 **O** Oxygen 16.00	9 **F** Fluorine 19.00	10 **Ne** Neon 20.18
10 VIIIB	11 IB	12 IIB	13 **Al** Aluminum 26.98	14 **Si** Silicon 28.09	15 **P** Phosphorus 30.97	16 **S** Sulfur 32.07	17 **Cl** Chlorine 35.45	18 **Ar** Argon 39.95
28 **Ni** Nickel 58.69	29 **Cu** Copper 63.55	30 **Zn** Zinc 65.39	31 **Ga** Gallium 69.72	32 **Ge** Germanium 72.61	33 **As** Arsenic 74.92	34 **Se** Selenium 78.96	35 **Br** Bromine 79.90	36 **Kr** Krypton 83.80
46 **Pd** Palladium 106.42	47 **Ag** Silver 107.87	48 **Cd** Cadmium 112.41	49 **In** Indium 114.82	50 **Sn** Tin 118.71	51 **Sb** Antimony 121.76	52 **Te** Tellurium 127.60	53 **I** Iodine 126.90	54 **Xe** Xenon 131.29
78 **Pt** Platinum 195.08	79 **Au** Gold 196.97	80 **Hg** Mercury 200.59	81 **Tl** Thallium 204.38	82 **Pb** Lead 207.2	83 **Bi** Bismuth 208.98	84 **Po** Polonium (209)	85 **At** Astatine (210)	86 **Rn** Radon (222)
110 **Ds** Darmstadtium (271)	111 **Rg** Roentgenium (272)	112 **Uub** Ununbium (277)						

65 **Tb** Terbium 158.93	66 **Dy** Dysprosium 162.50	67 **Ho** Holmium 164.93	68 **Er** Erbium 167.26	69 **Tm** Thulium 168.93	70 **Yb** Ytterbium 173.04	71 **Lu** Lutetium 174.97
97 **Bk** Berkelium (247)	98 **Cf** Californium (251)	99 **Es** Einsteinium (252)	100 **Fm** Fermium (257)	101 **Md** Mendelevium (258)	102 **No** Nobelium (254)	103 **Lr** Lawrencium (262)

Electromagnetic Spectrum

(measurement in meters)



Polyatomic Ions	
NH_4^+	Ammonium
$C_2H_3O_2^-$	Acetate
ClO_3^-	Chlorate
MnO_4^-	Permanganate
NO_3^-	Nitrate
OH^-	Hydroxide
CO_3^{2-}	Carbonate
CrO_4^{2-}	Chromate
SO_4^{2-}	Sulfate
PO_4^{3-}	Phosphate