

# Physical Science Reference Tables

## MOTION AND ENERGY

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

$v$  = velocity

$d$  = position

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

$t$  = time

$a$  = uniform acceleration

$$F = ma$$

$F$  = force

$$F_g = mg$$

$m$  = mass

$$W = F\Delta d$$

$F_g$  = weight

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

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

$W$  = work

$$PE_g = mgh = F_g h$$

$P$  = power

$PE_g$  = gravitational potential energy

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

$h$  = height

$KE$  = kinetic energy

$$v_w = f\lambda$$

$v_w$  = wave velocity

$f$  = frequency

$\lambda$  = wavelength

## ELECTRICITY

$$V = IR$$

$V$  = electrical potential difference

$I$  = current

$$P = VI$$

$R$  = resistance

$P$  = power

## DENSITY

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

$D$  = density

$m$  = mass

$V$  = volume

# PERIODIC TABLE

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

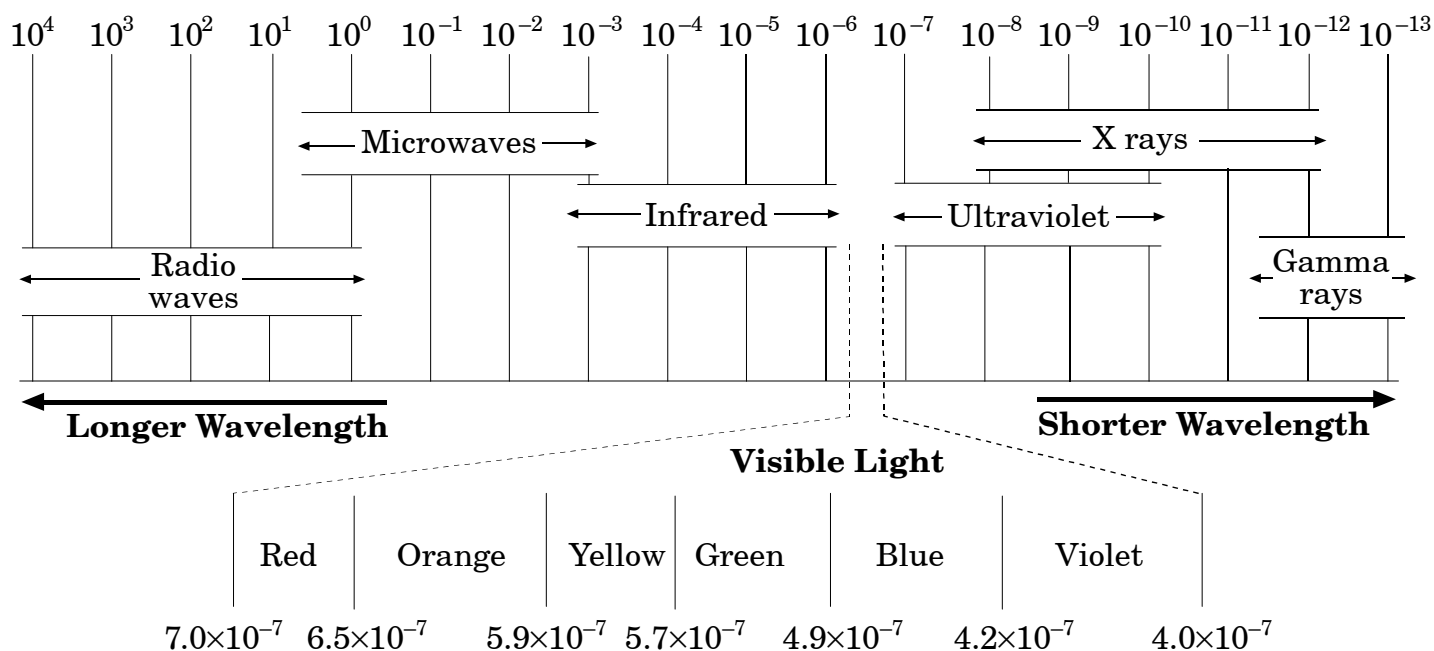
58 <b>Ce</b> Cerium 140.12	59 <b>Pr</b> Praseodymium 140.91	60 <b>Nd</b> Neodymium 144.24	61 <b>Pm</b> Promethium (145)	62 <b>Sm</b> Samarium 150.36	63 <b>Eu</b> Europium 151.96	64 <b>Gd</b> Gadolinium 157.25
90 <b>Th</b> Thorium 232.04	91 <b>Pa</b> Protactinium 231.04	92 <b>U</b> Uranium 238.04	93 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

# OF THE ELEMENTS

									18 VIII A
			13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	2 <b>He</b> Helium 4.003	
			5 <b>B</b> Boron 10.81	6 <b>C</b> Carbon 12.01	7 <b>N</b> Nitrogen 14.01	8 <b>O</b> Oxygen 16.00	9 <b>F</b> Fluorine 19.00	10 <b>Ne</b> Neon 20.18	
10 VIII B	11 IB	12 IIB	13 <b>Al</b> Aluminum 26.98	14 <b>Si</b> Silicon 28.09	15 <b>P</b> Phosphorus 30.97	16 <b>S</b> Sulfur 32.07	17 <b>Cl</b> Chlorine 35.45	18 <b>Ar</b> Argon 39.95	
28 <b>Ni</b> Nickel 58.69	29 <b>Cu</b> Copper 63.55	30 <b>Zn</b> Zinc 65.39	31 <b>Ga</b> Gallium 69.72	32 <b>Ge</b> Germanium 72.61	33 <b>As</b> Arsenic 74.92	34 <b>Se</b> Selenium 78.96	35 <b>Br</b> Bromine 79.90	36 <b>Kr</b> Krypton 83.80	
46 <b>Pd</b> Palladium 106.42	47 <b>Ag</b> Silver 107.87	48 <b>Cd</b> Cadmium 112.41	49 <b>In</b> Indium 114.82	50 <b>Sn</b> Tin 118.71	51 <b>Sb</b> Antimony 121.76	52 <b>Te</b> Tellurium 127.60	53 <b>I</b> Iodine 126.90	54 <b>Xe</b> Xenon 131.29	
78 <b>Pt</b> Platinum 195.08	79 <b>Au</b> Gold 196.97	80 <b>Hg</b> Mercury 200.59	81 <b>Tl</b> Thallium 204.38	82 <b>Pb</b> Lead 207.2	83 <b>Bi</b> Bismuth 208.98	84 <b>Po</b> Polonium (209)	85 <b>At</b> Astatine (210)	86 <b>Rn</b> Radon (222)	
110 <b>Ds</b> Darmstadtium (271)	111 <b>Rg</b> Roentgenium (272)	112 <b>Uub</b> Ununbium (277)							
65 <b>Tb</b> Terbium 158.93	66 <b>Dy</b> Dysprosium 162.50	67 <b>Ho</b> Holmium 164.93	68 <b>Er</b> Erbium 167.26	69 <b>Tm</b> Thulium 168.93	70 <b>Yb</b> Ytterbium 173.04	71 <b>Lu</b> Lutetium 174.97			
97 <b>Bk</b> Berkelium (247)	98 <b>Cf</b> Californium (251)	99 <b>Es</b> Einsteinium (252)	100 <b>Fm</b> Fermium (257)	101 <b>Md</b> Mendelevium (258)	102 <b>No</b> Nobelium (254)	103 <b>Lr</b> Lawrencium (262)			

## Electromagnetic Spectrum

(measurement in meters)



Polyatomic Ions	
$\text{NH}_4^+$	Ammonium
$\text{C}_2\text{H}_3\text{O}_2^-$	Acetate
$\text{ClO}_3^-$	Chlorate
$\text{MnO}_4^-$	Permanganate
$\text{NO}_3^-$	Nitrate
$\text{OH}^-$	Hydroxide
$\text{CO}_3^{2-}$	Carbonate
$\text{CrO}_4^{2-}$	Chromate
$\text{SO}_4^{2-}$	Sulfate
$\text{PO}_4^{3-}$	Phosphate