

USE WITH FORMS C-I

Periodic Table of the Elements

1 H 1.008																	2 He 4.003	
3 Li 6.941	4 Be 9.012																9 F 18.998	10 Ne 20.18
11 Na 22.99	12 Mg 24.305																17 Cl 35.453	18 Ar 39.948
19 K 39.098	20 Ca 40.078	21 Sc 44.956	22 Ti 47.88	23 V 50.942	24 Cr 51.996	25 Mn 54.938	26 Fe 55.85	27 Co 58.933	28 Ni 58.69	29 Cu 63.546	30 Zn 65.39	31 Ga 69.723	32 Ge 72.61	33 As 74.923	34 Se 78.96	35 Br 79.904	36 Kr 83.8	
37 Rb 85.47	38 Sr 87.62	39 Y 88.906	40 Zr 91.224	41 Nb 92.906	42 Mo 95.94	43 Tc 98.91	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.75	52 Te 127.6	53 I 126.9	54 Xe 131.29	
55 Cs 132.91	56 Ba 137.33	* 57 La 138.91	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.08	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.2	83 Bi 208.98	84 Po 209	85 At 210	86 Rn 222	
87 Fr 223	88 Ra 226.02	** 89 Ac 227	104 Rf 261.11	105 Db 262.11	106 Sg 263.12	107 Bh 262.12	108 Hs 265	109 Mt 266	110 Ds 269	111 Rg 272								
*Lanthanoid Series																		
		58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm 145	62 Sm 150.36	63 Eu 151.97	64 Gd 157.25	65 Tb 158.92	66 Dy 162.5	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04	71 Lu 174.97			
**Actinoid Series																		
		90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np 237.05	94 Pu 244	95 Am 243	96 Cm 247	97 Bk 247	98 Cf 251	99 Es 254	100 Fm 257	101 Md 258	102 No 259	103 Lr 260			

Information for the Periodic Table of the Elements obtained from Royal Society of Chemistry.

USE WITH FORMS E-I

Science Reference Sheet

Motion and Forces

$$v_{avg} = \frac{\Delta x}{\Delta t} \quad v = v_0 + at$$

$$x = v_0 t + \frac{1}{2} at^2 \quad v^2 = v_0^2 + 2ax$$

$$\Sigma F = F_{net} = ma \quad a_c = \frac{v^2}{r}$$

$$F_g = G \frac{m_1 m_2}{R^2} \quad F_g = mg$$

$$\text{Mechanical Advantage (MA)} = \frac{\text{load force}}{\text{effort force}}$$

$$\text{Efficiency} = \frac{\text{work output}}{\text{work input}} \times 100\%$$

a = acceleration

a_c = centripetal acceleration

F = force

F_g = gravitational force or weight

g = gravitational acceleration

G = universal gravitational constant

m = mass

r = radius

R = distance between m_1 and m_2

t = time

v = speed

v_{avg} = average speed

v_0 = initial speed

x = distance

Waves

$$v = f\lambda \quad n = \frac{c}{v}$$

c = the speed of light

f = frequency

n = index of refraction

v = wave speed

λ = wavelength

Conservation of Momentum and Energy

$$W = Fd \cos \theta \quad KE = \frac{1}{2} mv^2$$

$$PE = mgh \quad P = \frac{W}{t}$$

$$p = mv \quad \Delta p = m\Delta v = Ft$$

$$m_1 v_1 + m_2 v_2 = m_1 v_1' + m_2 v_2'$$

d = distance

F = force

g = gravitational acceleration

h = height

KE = kinetic energy

m = mass

p = momentum

P = power

PE = potential energy

t = time

v = speed

W = work

θ = angle

Electric and Magnetic Phenomena

$$E = \frac{F}{q} \quad V = IR$$

$$P = IV \quad P = I^2 R$$

E = electric field

F = force

I = current

P = power

q = charge

R = resistance

V = potential difference or voltage

Heat and Thermodynamics

$$Q = mc\Delta T \quad Q = mL$$

$$W = P\Delta V \quad Q = \Delta U + W$$

c = specific heat capacity

L = latent heat

m = mass

P = pressure

Q = heat

T = temperature

U = internal energy

V = volume

W = work

Physical Constants

Gravitational acceleration on Earth:

$$g = 9.8 \text{ m/s}^2$$

Universal gravitational constant:

$$G = 6.67 \times 10^{-11} \text{ N}\cdot\text{m}^2/\text{kg}^2$$

Proton mass:

$$m = 1.67 \times 10^{-27} \text{ kg}$$

Electron mass:

$$m = 9.11 \times 10^{-31} \text{ kg}$$

Elementary charge:

$$e = 1.6 \times 10^{-19} \text{ C}$$

Speed of light:

$$c = 3.0 \times 10^8 \text{ m/s}$$

General

$$d = \frac{m}{v}$$

d = density

m = mass

v = volume