

<p>LENGTH/VELOCITY 10008 Km = pole to equat 1 mile = 5280 feet = 1000 Roman 2 steps 1 foot = Charlemane's 1 cubit = elbow to finger 1 fathom = 6ft arm/arm 1 furlong = 1/8 mile =10 chains 1 naut mile = 6080 ft =1 minute of a degree 1 league = 3 naut mile 1 in = 2.54 cm 1A = 1E-10 meters 1 parsec = 3.084E13 Km Light = 2.99795E8 m/s Sound = 1127 ft/sec 1 mile/hour = 1.47ft/s</p> <p>AREA 1 acre = 1 oxen/day = 10 square chains 1 mile^2 = 640 acres 1 hectare = 10E4 m^2 1 circular mil = (PI/4)E-6 in^2</p> <p>MonthlyPayments= Prin(I/(1-(1+i)^-N) i=Int/12 N=#months</p> <p>trillion 10^18 billion 10^12 exa ^18 deci ^-1 petra^15 centi ^-2 tera ^12 milli ^-3 giga ^9 micro ^-6 mega ^6 nano ^-9 kilo ^3 pico ^-12 hecto^2 femto ^-15 deka^+1 atto ^-18</p> <p>GAS 1 Atm= 76.0 cm Hg =14.7 lbf/in =101.3KPa 1 pascal=N/m^2 1 torr = 1mm Hg 1 millibar = 100 Pa 1 mole = 6.022045E23 volume = 22.4138 liter PV =RT R = 8.31441J/K Air = 1.29grams/liter =75%N,21%O, .94%Inert, .04%CO2,0.2%H2O</p>	<p>VOLUME 1 liter= 1000 cm^3 = 1 Kgm H2O 1 milliliter = 1cm^3 1 fl oz = 30 cm^3 = 1/16 pint 1 tsp = 5 cm^3 1 Tbsp= 15 cm^3 1 cup = 1/2 pint 1 quart = 2 pints = .9353 liters 1 Gallon = 4 quarts 1 Bushel = 8 Gal = 4 Pecks 1 Gill = 1/4 pint</p> <p>MASS and FORCE 1 Kg = 1liter H2O = 2.2046 lbs = .0685 slugs 1Kgf = 9.807 Newtons 1 lbf =slug weight = 4.448 Newtons 1 lbm =16 ozm 1 ozm = 28.35 grams = 437.5 grains 1 metric ton = 1000Kg 1 ton short = 2000lb g = 32.1740 ft/sec^2 = 9.807 m/sec^2</p> <p>ENERGY 1 cal = 1gm H2O 1C = 4.186 joules 1 BTU = 1lb H2O 1F = 778.28 ft-lbs 1 Therm = 1E5 BTU 1 cordwood = 4X4X8 ft = about 240 Therms 1 Watt = 3.413 BTU/hr = 860 cal/hour 1 ft-lb = 1.356 watt 1 horsepower = 746 watt = 550 ft-lb/sec Man = 3 Megcal/day = 3/4 pounds fat running = 600Kcal/hour walking = 200 sit = 100 1 Phon = 2E-5 N/M^2</p> <p>R=F+459.67 K=C+273.15</p> <p>NUCLEAR Fusion = 2 E8 ev/atom ev = 1.6 E-19 Joules U235 1 mole =235 grams criticalmass U235 = 20 lbs 1/2 life Neut = 12 min</p>	<p>ELECTRIC Weber =Joul/Amp Tesla = Weber/m^2 Gauss =1E-10W/cm^2 B = uH V = NA^db/dt NI=HL Energy = V^2*C/2 = eE^2/2 i^2*I/2 = uH^2/2 P = HxE</p> <p>LIGHT Red/Yellow/Violet = .7um/.6/.45um 1 ftcandle = 1Lum/ft^2 1 sphere = 4*PI*ster 1 Lumen = candelaster 40 Watts = 40 candlePwr 100 Watts = 125 candlePwr 12.56 Lumens=1candlePwr 680 Lum = 1watt @blue photons = wl*watt/h*c Sun = E+5 Lum/meter^2 Moon = 3E-1Lm/meter^2</p> <p>DENSITY H2O=62.431lbm/ft^3 =1E+3 Kg/m^3 Alum=2.7 Lead=11.3 Steel=7.9 Gold=19.3 Copper =8.9 Hg=13.6 Tin =7.3 Brass=13.6 Silver=10.5 Nickel=8.9 Silicon=2.42 Sufur=2 Air = .0013 H2= .00009</p> <p>SPHERE S = 4*PI*R^2 V = (4*PI*R^3)/3 C = 2.9979245E8 m/s G = 6.67E-11m^3/Kgs^2 q = 1.6021892E-19Cou h = 6.626176E-34 J*s N = 6.022045E+23 R = 8.3141J/mole*K V = 22.41383 liters k = 1.380662E-23 J/K F = 9.649E4 Cou/mole u = 4*PI*E-7 H/m e = (1/36*PI) *E-9 F/m SB = 5.670E-8W/m^2*K^4 mn = 1.6749543E-27Kg mp = 1.6726485E-27Kg me = 9.1095344E-31Kg mr = 5.2917706E-11m</p> <p>1 fortnight = fourteen nights</p>	<p>PHYSICS c = speed of light = 1/(e*u)^1/2 Z of space = 377 ohms = (u/e)^1/2 e = 1/36E-9 F/meter u = 4*PI*E-7 Henry/m c = (S/u)^1/2 S = tension on wire = pressure per volume u = mass per length = mass per volume</p> <p>Force = Kqq'/r^2 k = e for electric and q = coulombs k = G for gravity and q = mass Magnetic Force= 1Amp=2E-7 Newtons/m</p> <p>energy per degree free = (1/2)*m*v^2 = (3/2)*nRt , R/No=k No = 6.02 E+23 heat capacity diatom gas = 4.98 cal/mole*C Max-Boltzman distr= # atoms/vel ran=dN/dv 4N/PI^*(1/2)* (m/2KT)^(3/2)* v^2*exp^-(mV^2/2kT)</p> <p>Entropy =ds ds = dQ/T delta heat/temp Uncertainty = dE*dt-dp*dx-h/(2PI) QUANTUM NUMBERS s,p,d,f sharp,principal, diffuse,fundamental 2,6,10,14 n=energy quantum l=orbit angle momen quan l=0,1,...n-1 ml= orbital magnet quant ml=-l,...-1,0,1,...l s=electron spin quant s= 1/2,-1/2</p> <p>LINEAR EXPAN/C Alum 23 (E-6/C) Copper 17/Steel 6.5 Glass?1.2-2.7/Hg?18 Gold 14/Lead 28 Nickel 13/Silver 19 latinum 8.9/</p>	<p>SNELL'S LAW n*sin@=n'sin@ 400nm to 700nm index for wavelength flint glass 1.65-1.61 crown glass 1.52-1.505 fused quartz 1.47-1.46 1/s+1/s'=1/f</p> <p>SOUND PRESSURE sound press level =SPL=20logP/.0002 P measured in bars 1 bar = 1ATM l=P^2/p*c l=sound intensity p,c=density,speed of sound in air .0002ubars= lref(OdB)= 1E-16 watts/cm2</p> <p>TV DATA Horz = 15734.24 =2/455 times Chroma Vert =59.94Hz =2/52H Horz blank = 18 H Vert blank= 21H Color Vector red x=.67 y=.33 blue x=.21 y=.71 green x=.14 y=.08 Video 45.75 Meg Sound 41.25 Meg</p> <p>POWER cord wood =240 therms Nat Gas 1000 BTU/ft^3 Gasoline 11E3 cal/gm R-30 FACTOR =1/30 BTU/ft^2 @ 1ft/hr walls 20 windows 2 man =100Kcal/hr sitting WINDPOWER P=(E*M*PI*D^2*V^3)/8 E =efficient =38% M= mass air =.08 lb/ft^3 D = dia blades V= velocity wind</p> <p>Wood=\$1/Therm Gas = \$.4/Therm Electric=\$2.70/Therm Therm=27.77KWHr</p>	<p>Mass earth =5.975E24Kgm 49%O,26%Si,7.5%Al 4.7%Fe,3.4%Ca,2.6%Na 2.4%K,1.9%Mg,0.9%H2 0.6%Ti,0.7% other Mass sun =1.99E30Kgm Mass moon=7.35E22Kgm 1AU =to sun =1.49E11m to moon=3.84E8m Dia sun=1.39E9m Dia moon =1.738 Earth incline 23.45 deg</p> <p>SILICON 5.00E22 Atom/cm^3 Diamond 8 atoms/unit 5.43 A lattice constant energy gap 1.11ev ni = 1.45E10/cm^3 mobity 1350cm^2/sec 480 cm^2/sec holes Breakdown field 30v/u Glass 600V/u Dielectric =11.7 Si Thermal expansion =3.9 Dielectric glass =3.9 2.5E-6 Si 5E-6 Glass Specific heat .76joule/g*C 1.0 Joule/g*C thermal conductive =84 Watts/meter*C</p> <p>ELECTRIC Resistance =p*(1+aT) ohms*m / 1/ C Alum 2.63E-8/.0039 Carbon 3.5E-5/.0005 Copper 1.72E-8/.00393 Silver 1.47E-8/.0038 Gold 2.44E-8/.0034 Glass 10E10-10E14 DIELECTRIC Air 1/Glass 5-10/TIO 173</p> <p>THERMALCOUPLE =a*T + (1/2)*b*T^2 Alum -.47/.003 uV/C Copper 2.76/.012 uV/C Gold 2.90/.0093 uV/C Iron 16.6/-.030 uV/C Nickel 19.1/-.030 uV/C Silver 2.50/.012 uV/C Platinum 2.5/.012 uV/C Steel 10.8/-.016 uV/C</p>
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<p>RICHTER EARTHQUAKE SCALE</p> <table border="1"> <thead> <tr> <th>Richter Magnitude</th> <th>Mercalli Intensity</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>I</td> <td>Usually not felt, detected by instruments.</td> </tr> <tr> <td>2</td> <td>II</td> <td>Felt by few, especially on upper floors of buildings, detected by instruments.</td> </tr> <tr> <td>3</td> <td>III</td> <td>Felt noticeably indoors, vibration likes passing vehicle, cars may rock.</td> </tr> <tr> <td></td> <td>IV</td> <td>Felt indoors by many, outdoors by few, dishes & doors disturbed, like heavy truck nearby, walls-cracking sound.</td> </tr> <tr> <td>4</td> <td>V</td> <td>Felt by most people, slight damage; some dishes & windows broken, some cracked plaster, trees disturbed.</td> </tr> <tr> <td>5</td> <td>VI</td> <td>Felt by all, many frightened and run outdoors, damage minor to moderate.</td> </tr> <tr> <td>5 to 6</td> <td>VII</td> <td>Everyone runs outdoors, much damage to poor design buildings, minor damage to good design buildings. some chimneys broken, noticed by people driving cars.</td> </tr> <tr> <td>6</td> <td>VIII</td> <td>Everyone runs outdoors, damage is moderate to major. 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