20-Mar	Spring Equinnox
first Sun April	Daylight saving
20-Jun	Summer Solstice
22-Sep	Autumn Equinnox
Last Sun Oct	Daylight saving
21-Dec	Winterr Solstice

Sea Water	ppm
CL	18980
Na	10561
Mg	1272
S	884
Ca	400
K	380
Au	0.000006

Km	Ft	lbs/in^2	Boil°C	m/sec
-1	-3281	16.52	218	344
-0.5	-1640	15.59	215	342
0	0	14.7	212	340
0.25	820.2	14.26	211	339
0.5	1640	13.85	209	338
1	3281	13.03	206	336
2	6562	11.53	200	332
5	16404	7.84	182	320
8	26247	5.17	164	308.2
10	32808	3.84	151	299
20	65617	0.8	94.5	295
30	98425	0.17	49.3	301

1Atm	=1bar	SPL_dB= sound pressure level=20*log(P/Pref)	
14.696 lbs/in^2	76cm Hg	Pref_dynes/cm^2	0.0002
1mmHg	1Torr	P_dynes/cm^2	633
Air_gm/liter	1.2928	SPL_dB	130.0074743
O2_gm/liter 21%	1.429	P_psi/in^2 (rms)	0.009180888
N2_gm/liter 78%	1.2506	P_dynes/cm^2	0.0002
H2_gm/liter	0.0899	SPL_dB	0
CO2_gm/liter	1.977	P_atm (rms)	2E-10
		P_pascals (rms)	0.00002
		1atm=10KPa	
2PT=1QT 8QT=1PECK		Pref=.00002pascal=2e-5N/meter^2	
4PECK=1 BUSHEL		Pref=.0002dynes/cm^2=.0002ubar	
16OZFL=1PT 4QT=1GAL		Pref=1e-16wat/cm^2	
1DRAM=1OZ		radiation power of speaker = 1watt	
16 OZ=1IB		Sound_Air_ft/sec	1130
		Sound_water_ft/sec	4900

G_force=(72/risetime_ms)*sqrt(height_in)
Shock rise time im msec

Steel againts concrete	1
Steel againts wood	2.5
Steel againts sand	5.5
Mud	15
1inch fet	20

9 volt	AH
=18ma*33hr	0.594

	Anode	Cathode	V	A-hr/Kg	C size	AH
Alkaline	Zn	MnO2	1.5	230	=37.5mA*160hr	6
NiCad	Cd	NiO	1.35	165	=1.2 Amp hours	1.2

0dB	silence	barely	3dB
8dB	threhold hearing	perceptible	5dB
15dB	whisper	twice as loud	10dB
20dB	empty theater		
40dB	private office		
60dB	normal conversation		
80dB	inside high speed car		
90dB	band	max 8hr/day	
100dB	Lawn mover	max 2hr/day	
110dB	close to train	max 30min/day	
120dB	Thunder	max 5min/day	
130dB	threshold pain		
140dB	Artillery & Jet		
196dB	Saturn Rocket	10KPa_rms= 1atm	
196dB	50lb TNT @ 50ft	10KPa_rms= 1atm	
225dB	Deafening		

GENERAL_GAS_LAWS_AND_FORMULAS

Perfect Gas Law:
PV = nRT
P= Pressure in atmospheres
V= Volume in liters n = Number of moles
R = Gas constant (0.0821 liler-atmospheres/K/mole)
T=Temperature in degrees K
If constant pressure V1/V2 = TI/T2
If constant temperature P1/P2 = V2/V1
If constant volume P1/P2 = TI/T2

Boyle's law
If temperature is kept constant, the volume of a given mass of gas is invenely proportional to the pressure which is ewerted upon it.

Initial_Pressure/Initial_Volume = Pressure_Change/Volume_Change

Charles' Law
If the pressure is constant, the volume of a gN•en mass of gas is directly proportional to the absolute temperature.

Initial_Volume/ InitialTemperature_K = Volume_Change/FinalTemperature_K

Dalton's Lav of Partial Pressures
The pressure which is exerted on the walls of a vessel is the sum of the pressures which each gas would exert if it were present alone.

Graham's Law or Diffusiun
Relative rates of diffusion of two gases are inversely proportional to the square roots of their densities.

Avogadro's Law
Equal volumes of gases, measured under the same conditions of temperature and pressure, contain equal numbers of molecules.

AirVelocity in n Pipe:
V=sqrt(25,000*D*P/L)

V = Air velocity in feet per second
D = Pipe inside diameter in inches
L = Length of pipe in feet
P = Pressure loss due to air friction in ounces/square inch

Approximate values of P are as follows:
Velocity Pipe Diameter in inches, 10 feet long

Ft/Se	1	2
1	0.004	0.0002
2	0.0016	0.0008
5	0.01	0.005
10	0.04	0.02
15	0.09	0.45
20	0.16	0.08
30	0.36	0.18

(Formula from B.F. Sturlevanl Co)

Air Volllme Discharged from Pipe:
CFM=60*V*A
CFM = Air volume in cubic feet per minute
V = Air velocity in feet per second as determined in the at the top of this page.

ANODE: the cell plate, or electrode, at which an oxidation reaction occurs. A cell's negative electrode is an anode when the cell is discharging, but a cathode when it is being charged. Possibly, the terms "positive" and "negative" may be more useful in identifying electrodes.

BATTERY: two or more cells connected to form a single unit. (Since contemporary usage allows for one cell batteries, the terms cell" and battery are sometimes used interchangeably.)

C-RATE: a rate of charge or dixharge in amperes numerically equal to the capacity of the battery in ampere hours. Multiples and submultiples of the C-rate are commonly used. For example, the specific energy of a battery is often specified for discharges at the U3 rate.

CATHODE: the cell plate, or electrode, at which a reduction region occurs. A cell's positive electrode is a cathode when the cell is discharging, but an anode [see above] when it is being charged.

CELL: an electrochemical energy-storage device consisting of two electrodes, or plates; an electrolyte; and (usually) a separator.

ELECTROLYTE: the ionic conductor, typically a liquid, that provides the internal connection between the plates of a cell.
The electrolyte must not be an electronic conductor lest it short-circuit the cell.

SECIFIC POWER: the gravimetric density of a battery, usually expred in watts/gm

LIFE: the total length of time that a battery will operate before it needs to be replaced. For primary batteries, it is expressed in hours-of actual use; for rechargeable, the limiting factor is the number of months or years since the battery was manufactured or the number of charge-discharges to which,it has been subjectedl Energy density: the luric''e storage, density of a battery, usually expressed in watt-hour per liter.

FLOAT CHARGING: the practice of keeping a storage battery ready use by means of a continuous, long-term constant-voltage, limited the charging regime.

MEMORY The reduction in capacity of a nickel-cadmium due to repeated partial discharge-charge cycles.

POWER DENSITY: the volumetric power density of a battery, usually expressed in watts per liter.

PRIMARY CELL: a cell that can be discharged only once.

SEONDARY CELL: a rechargeable celi.

SEPARATOR: a nonconductous material inserted behveen,the plates of a cell to keep them from shorting together. Although self nonconductive, the separator must be permeablile to the electrolyte solution so that ionic conductivity is maintained between the plates.

SPECIFIC ENERGY: the gravimetric energy storage density of a battery, expressed in watt-houn per kilogram.