

Chemistry Non-Traditional Instruction Lessons

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Name: _____

English/Metric Conversions

1 hour = 3600 seconds 1 mile = 5280 feet
1 yard = 3 feet 1 meter = 3.28 feet
1 km = 0.62 miles 1 lb = 0.45 kg
1 kg = 2.2 lbs 1 quart = 0.946 liters
1 m/s = 2.2 miles/hour 1 foot = 12 inches
1 inch = 2.54 cm

Examples: How many liters are in 445 mL?

$$445 \cancel{\text{mL}} \times \frac{1 \text{ L}}{1,000 \cancel{\text{mL}}} = 0.445 \text{ L}$$

How many seconds are in 1.25 days?

$$1.25 \cancel{\text{day}}/\cancel{\text{s}} \times \frac{24 \cancel{\text{hours}}}{1 \cancel{\text{day}}} \times \frac{60 \cancel{\text{min}}}{1 \cancel{\text{hour}}} \times \frac{60 \text{ s}}{1 \cancel{\text{min}}} = 108000 \text{ s}$$

DAY 1

On your OWN PAPER, work out the following metric conversions. SHOW YOUR WORK.

- How many meters are in 5 kilometers?
- How many micrograms are in 4 grams?
- How many milliliters are in 10 liters?
- How many grams are in 9,000,000 micrograms?
- How many meters are in 20 decimeters?

DAY 3

On your OWN PAPER, work out following density problems. SHOW YOUR WORK.

Density Problems 1

Find the density of a sample whose mass is 25.0 g and whose volume is 82.3 cm³.

D = Density
M = Mass
V = Volume

1 $D = \frac{M}{V}$

2 $D = \frac{25.0\text{g}}{82.3\text{cm}^3}$

3 $D = 0.304\text{g/cm}^3$

4 Units = g/cm³

Or $3.04 \times 10^{-1} \text{ g/cm}^3$

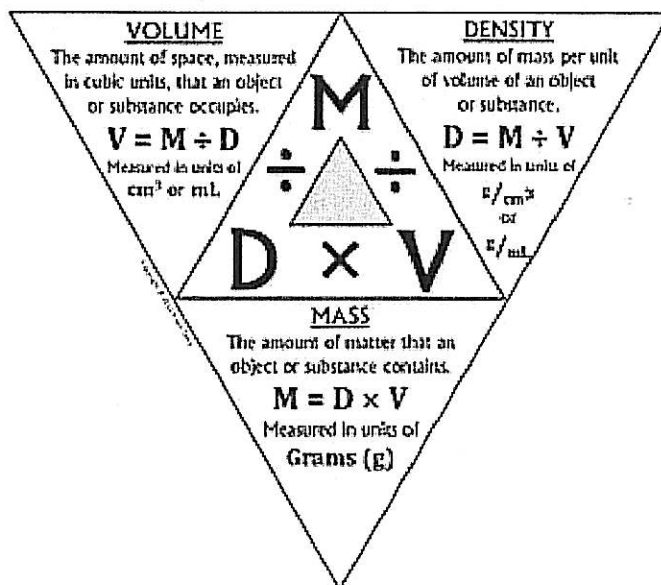
- What is the density of a block of wood with a mass of 350g and a volume of 185cm³?
- A tennis ball has a volume of 75cm³ and a density of 1.05g/cm³. What is the mass of the ball?
- A sheet of metal has a mass of 100g and a density of 0.75g/cm³. What is the volume of the metal?
- What is the density of a wooden block with a volume of 300cm³ and a mass of 520g?
- What is the volume of a glass prism that has a mass of 55g and a density of 1.9g/cm³?

Factor	Prefix	Symbol	Examples
10 ⁹	giga	G	1 Gm = 1 gigameter = 10 ⁹ m 1 Gb = 1 gigabyte = 10 ⁹ bytes
10 ⁶	mega	M	1 Mm = 1 megameter = 10 ⁶ m 1 Mb = 1 megabyte = 10 ⁶ bytes
10 ³	kilo	K	1 Km = 1 kilometer = 10 ³ m 1 Kg = 1 kilogram = 10 ³ g
10 ⁻¹	deci	d	1 dm = 1 decimeter = 0.1 m
10 ⁻²	centi	c	1 cm = 1 centimeter = 0.01 m
10 ⁻³	milli	m	1 mg = 1 milligram = 0.001 g 1 ms = 1 millisecond = 0.001 s
10 ⁻⁶	micro	μ	1 μm = 1 micrometer = 10 ⁻⁶ m 1 μs = 1 microsecond = 10 ⁻⁶ s
10 ⁻⁹	nano	n	1 ns = 1 nanosecond = 10 ⁻⁹ s
10 ⁻¹²	pico	p	1 pg = 1 picogram = 10 ⁻¹² g

DAY 2

On your OWN PAPER, work out the following English/metric conversions. SHOW YOUR WORK.

- How many yards are in 30 feet?
- How many centimeters are in 12 feet?
- How many kilograms are in 150 lbs?
- How many miles are in 10,000 feet?
- How many quarts are in 2 liters?



DAY 4

Use the periodic table to answer the following questions on your OWN PAPER.

- 1) What is the atomic number for nitrogen (N)?
- 2) What is the atomic number for uranium (U)?
- 3) What is the atomic mass number for titanium (Ti)?
- 4) What is the atomic mass number for magnesium(Mg)?
- 5) How many protons does lithium(Li) have?
- 6) How many electrons does neon(Ne) have?
- 7) How many neutrons does phosphorus(P) have?
- 8) How many protons, neutrons, and electrons does oxygen (O) have?
- 9) How many neutrons does beryllium (Be)?
- 10) How many neutrons does hydrogen(H) have?

DAY 5

Use the periodic table to answer the following questions on your OWN PAPER.

- 1) What is the atomic number for fluorine (F)?
- 2) What is the atomic number for Einsteinium (Es)?
- 3) What is the atomic mass number for scandium (Sc)?
- 4) What is the atomic mass number for sodium (Na)?
- 5) How many protons does boron(B) have?
- 6) How many electrons does argon(Ar) have?
- 7) How many neutrons does sulfur(S) have?
- 8) How many protons, neutrons, and electrons does carbon (C) have?
- 9) How many neutrons does aluminum (Al)?
- 10) How many neutrons does helium(He) have?

PERIODIC CHART OF THE ELEMENTS

IA	IIA	IIIB	IVB	VB	VIB	VIIIB	VIII	IB	IIB	IIIA	IVA	VA	VIA	VIIA	INERT GASES				
1 H 1.00797														1 H 1.00797	2 He 4.0026				
3 Li 6.939	4 Be 9.0122													5 B 10.811	6 C 12.0112	7 N 14.0067	8 O 15.9994	9 F 18.9984	10 Ne 20.183
11 Na 22.9898	12 Mg 24.312													13 Al 26.9815	14 Si 28.086	15 P 30.9738	16 S 32.064	17 Cl 35.453	18 Ar 39.948
19 K 39.102	20 Ca 40.08	21 Sc 44.956	22 Ti 47.90	23 V 50.942	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.71	29 Cu 63.54	30 Zn 65.37	31 Ga 69.72	32 Ge 72.59	33 As 74.9216	34 Se 78.96	35 Br 79.909	36 Kr 83.80		
37 Rb 85.47	38 Sr 87.62	39 Y 88.905	40 Zr 91.22	41 Nb 92.906	42 Mo 95.94	43 Tc (99)	44 Ru 101.07	45 Rh 102.905	46 Pd 106.4	47 Ag 107.870	48 Cd 112.40	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.904	54 Xe 131.30		
55 Cs 132.905	56 Ba 137.34	*57 La 138.91	72 Hf 178.49	73 Ta 180.948	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.09	79 Au 196.967	80 Hg 200.59	81 Tl 204.37	82 Pb 207.19	83 Bi 208.980	84 Po (210)	85 At (210)	86 Rn (222)		
87 Fr (223)	88 Ra (226)	†89 Ac (227)	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (262)	108 Hs (265)	109 Mt (266)	110 ? (271)	111 ? (272)	112 ? (277)								

Numbers in parenthesis are mass numbers of most stable or most common isotope.

Atomic weights corrected to conform to the 1963 values of the Commission on Atomic Weights.

The group designations used here are the former Chemical Abstract Service numbers.

* Lanthanide Series

58 Ce 140.12	59 Pr 140.907	60 Nd 144.24	61 Pm (147)	62 Sm 150.35	63 Eu 151.96	64 Gd 157.25	65 Tb 158.924	66 Dy 162.50	67 Ho 164.930	68 Er 167.26	69 Tm 168.934	70 Yb 173.04	71 Lu 174.97
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† Actinide Series

90 Th 232.038	91 Pa (231)	92 U 238.03	93 Np (237)	94 Pu (242)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (249)	99 Es (254)	100 Fm (253)	101 Md (256)	102 No (256)	103 Lr (257)
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