

Prerequisite Knowledge Required for Biology 48 - Human Physiology

College chemistry is a prerequisite for Biology 48 and our expectations of you as you enter this course are as follows:

1. You should be familiar with the metric system and be able to convert metric units from one form to another (i.e. liters to milliliters).
2. You should be able to do basic algebra.
3. You should be able to use dimensional analysis or other mathematical techniques to solve basic mathematical problems.
4. You should be able to define and understand the following: molecule, molecular weight, atomic weight, valence, ion, isotope, covalent bonds, ionic bonds, hydrolysis reactions, condensation reactions, dissociation, solution, pH, acid, base, buffer.
5. You should know how to calculate the molarity and normality of a solution.
6. You should be familiar with the basic concepts of inorganic chemistry.
7. You **MUST** be conscious of laboratory safety procedures and chemical handling.

Some of these skills are so essential to the study of physiology that they will be reviewed, however they should all be familiar to you. Below are some problems to test the skills listed above. Work through these problems, reviewing as necessary until you are comfortable with this material. You will not be graded on this Pre-Test but you are expected to know this material. **Note:** If you have not had a course in college chemistry you should not be taking this course.

Pre-Test

1. Define molecular weight and gram molecular weight.
2. Calculate the molecular weight of sodium chloride (NaCl), potassium chloride (KCl), calcium chloride (CaCl₂), and glucose (C₆H₁₂O₆).
3. What is the valence of the following ions: sodium, potassium, calcium, chloride, hydrogen.
4. Define mole, molarity, solution, solvent, solute.
5. How much solute (in moles) is in 1 liter of a 1 molar solution? 500ml of a 1 molar solution? 500ml of a 2 molar solution?
6. Twenty five grams of sodium chloride is dissolved in one liter of water. What is the molarity of this solution?
7. Forty five grams of glucose is dissolved in 500ml of water. What is the molarity of this solution?
8. How many grams of potassium chloride are in 100ml of a 0.2 molar solution?
9. How many grams of glucose are in 2 liters of a 2 molar glucose solution?
10. A man weighs 140 pounds. How much does he weigh in kilograms? grams? milligrams?
11. A little girl is one meter tall. How tall is she in decimeters? millimeters? inches?
12. If 10 apples weight 4 pounds, how much do 13 apples weigh?
13. How many milliliters are in 0.2 liters? 100 microliters?
14. How many molecules of chloride will combine with one molecule of sodium? with one molecule of calcium?
15. If 200ml of saltwater contains 1.8 grams of sodium chloride, how many grams are in 500ml? What is the molarity of this solution? What is the concentration of sodium chloride in milligrams per 100ml?

PERIODIC TABLE OF THE ELEMENTS

1																	17	18
1 H 1.008																	1 H 1.008	2 He 4.003
3 Li 6.941	4 Be 9.012	← Transition Metals →										5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18	
11 Na 22.99	12 Mg 24.30	3	4	5	6	7	8	9	10	11	12	13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95	
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.87	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.39	31 Ga 69.72	32 Ge 72.61	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80	
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (97.91)	44 Ru 101.1	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3	
55 Cs 132.9	56 Ba 137.3	71 Lu 175.0	72 Hf 178.5	73 Ta 180.9	74 W 183.8	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.1	79 Au 197.0	80 Hg 200.6	81 Tl 204.4	82 Pb 207.2	83 Bi 209.0	84 Po (209.0)	85 At (210.0)	86 Rn (222.0)	
87 Fr (223.0)	88 Ra (226.0)	103 Lr (262.1)	104 Rf (261.1)	105 Db (262.1)	106 Sg (263.1)	107 Bh (264.1)	108 Hs (265.1)	109 Mt (266.1)	110 Uu (269.1)	111 Uu (272.1)	112 Uu (277.1)							

Lanthanides	57 La 138.9	58 Ce 140.1	59 Pr 140.9	60 Nd 144.2	61 Pm (144.9)	62 Sm 150.4	63 Eu 152.0	64 Gd 157.2	65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0
Actinides	89 Ac (227.0)	90 Th 232.0	91 Pa 231.0	92 U 238.0	93 Np (237.0)	94 Pu (244.1)	95 Am (243.1)	96 Cm (247.1)	97 Bk (247.1)	98 Cf (251.1)	99 Es (252.1)	100 Fm (257.1)	101 Md (258.1)	102 No (259.1)