Honors Chemistry – Summer Work

1. Memorize the 50 common elements (Name and symbol).
2. Memorize the given common polyatomic ions (Name, formula, and charge).
3. Metric System Review WorkSheet
4. Temperature Conversions Review WorkSheet
5. Scientific Notation Review WorkSheet
6. Know lab safety and common lab equipment used in Chemistry

The best way to learn names and symbols of elements and ions is to make flash cards. You will have a quiz over the elements the second day of class and a quiz over the polyatomic ions the second week of class. A hard copy of the review worksheets will be due on the first day of class, Aug. 13. The review topics will be included on the first test.

50 Common Elements

1. Helium ..... He

2. Lithium Li

3. Hydrogen ..... H

4. Sodium (Natrium)..... Na

5. Boron ..... B

6. Carbon C

7. Silicon ..... Si

8. Calcium (Lime) ..... Ca

9. Beryllium ..... Be

10. Fluorine ..... F

11. Neon ..... Ne

12. Sulfur (Brimstone)... S

13. Phosphorus ..... P

14. Nitrogen ..... N

15. Strontium ..... Sr

16. Xenon ..... Xe

17. Uranium ..... U

18. Aluminum ..... Al

19. Potassium (Kalium) ... K

20. Chlorine Cl

21. Argon ..... Ar

22. Magnesium ..... Mg

23. Iron (Ferrum) ..... Fe

24. Bromine ..... Br

25. Oxygen ..... O

26. Manganese ..... Mn

27. Copper (Cuprum)..... Cu

28. Cobalt ..... Co

29. Nickel ..... Ni

30. Chromium ..... Cr

31. Lead (Plumbum)..... Pb

32. Tungsten (Wolfram) W

33. Gold (Aurum) ..... Au

34. Mercury (Hydrargyrum) ... Hg

35. Zinc ..... Zn

36. Krypton ..... Kr

37. Rubidium ..... Rb

38. Silver (Argentum)... Ag

39. Iodine I

40. Platinum ..... Pt

41. Cadmium ..... Cd

42. Tin (Stannum) .....Sn

43. Cesium ..... Cs

44. Barium ..... Ba

45. Francium ..... Fr

46. Antimony (Stibium)..... Sb

47. Bismuth ..... Bi

48. Arsenic ..... As

49. Radon ..... Rn

50. Radium ..... Ra

Polyatomic Ions

Polyatomic Ion Charge = +1

ammonium – NH_4^+
hydronium – H_3O^+

Polyatomic Ion Charge = -1

acetate - $C_2H_3O_2^-$

bicarbonate (or hydrogen carbonate) - HCO_3^-

bisulfate (or hydrogen sulfate) - HSO_4^-

chlorate – ClO_3^-

cyanide - CN^-

hydroxide - OH^-

nitrate - NO_3^-

nitrite - NO_2^-

permanganate - MnO_4^-

Polyatomic Ion Charge = -2

carbonate - CO_3^{-2}

chromate - CrO_4^{-2}

dichromate - $Cr_2O_7^{-2}$

sulfate - SO_4^{-2}

sulfite - SO_3^{-2}

oxalate – $C_2O_4^{-2}$

Polyatomic Ion Charge = -3

phosphate - PO_4^{-3}

Metric system

Prefixes: Size (in proportion to the base unit), Prefix, Symbol

1 x 10^6 micro (μ) = 1000 milli (m) = 100 centi (c)= 10 deci (d)= 1 base unit = .1 deca (da) = .01 hecto (h) = .001 kilo (k)

Example: with the base unit grams

kilo – kg; hecto - hg; deca – dag; gram – g; deci – dg; centi – cg; milli - mg ; micro - μg

Use dimensional analysis to solve:

Example: How many meters are in 247**.** centimeters? Given: 247 cm = _____ m
1. Start with given: 247 cm
2. Find equivalent in units given to units you're trying to find: 100 cm = 1 m
3. Use a ratio to solve – canceling units:

$$247\ \cancel{cm}\ x\ \frac{1m}{100\cancel{cm}} = \underline{2.47\ \text{m}}$$

Practice: Convert the following (showing work, including units) :

1) 1.49 cm =_____m

2) 79.3 m =_____mm

3) .126 cm =_____km

4) 5.2 km =_____m

5) 150 ml =_____L

6) 6053 m =_____cm

7) 300 ml =_____L

8) 80 kg =_____g

9) 12 mm =_____m

10) 35 cm =_____mm

11) 0.15 L =_____ml

12) 35.7 mg =_____g

13) 56 ml =_____L

14) 0.006 km =_____mm

15) 3501 cm =_____km

16) 1500 µm =_____mm

17) 1.6 mm =_____dm

18) 2.0 mm =_____cm

19) 1.7 cm =_____mm

20) 109 cm =_____ km

Temperature Conversions Worksheet

Celsius is the temperature of choice when making measurements in Chemistry. To convert from Farenheit (our somewhat dated temperature scale) to Celsius: Use the following formula: $^oF = 9/5^oC + 32$

Convert the following Fahrenheit temperatures to Celsius:

1) 2200^{o}F (ceramic kiln) = _____

2) 98.6^{o}F (normal body temperature) = _____

3) -18^{o}F (Freon refrigerant in ice rink) = _____

4) 650^{o}F (Brick pizza oven) = _____

5) 451^{o}F (book paper burns) = _____

6) 134^{o}F (record high in Death Valley) = _____

Convert the following Celsius temperatures to Fahrenheit:

7) -27^{o}C (January in Yellowknife, NT) = _____

8) 961.78^{o}C (melting point of silver) = _____

9) 200^{o}C (antifreeze boils) = _____

Kelvin is a temperature scale required in many calculations made in Chemistry. To **convert to Kelvins from Celsius or ^{o}C to K, use the following formula: $K = {}^oC + 273$**

Complete the following (show work and include units in your answer.)

10) -15^{o}C = _____

11) 200^{o}C = _____

12) -196^{o}C (boiling point of Nitrogen) = _____

13) 15^{o}C (sun tanning in Montreal) = _____

14) -273^{o}C (absolute zero) = _____

15) 25^{o}C = _____

16) 375 K = _____

17) 278 K = _____

18) 225 K = _____

19) 1492 K = _____

Scientific Notation WS

Converting from ordinary notation to Scientific Notation

Place the decimal point after the first non-zero digit, and count the number of places the decimal point has moved. If the decimal place has moved to the *left* (because it is a number larger than 9) then use that number as a positive power of 10; to the right (a number smaller than 1) then use that number as a negative power of 10.

Example: **To write 3040 in scientific notation we must move the decimal point 3 places to the left, so it becomes 3.04×10^{3}.**

Example: **To write 0.00012 in scientific notation we must move the decimal point 4 places to the right: 1.2×10^{-4}.**

Convert the following from ordinary notation to scientific notation:

1) 1900 _____
2) 0.00352 _____
3) 12.1 _____
4) 15,000,000 _____
5) 0.0000007 _____
6) 0.01972 _____
7) 260,200 _____
8) 0.000048 _____
9) 0.51 _____
10) 395 _____

Converting from Scientific Notation to ordinary notation:

If the exponent of 10 is positive, then move the decimal point to the right (make the number larger); if it is negative, then move it to the left (make the number smaller).

Example: **Convert 4.01×10^{2}. We move the decimal point two places to the right making 401.**

Example: **Convert 5.7×10^{-3}. We move the decimal point three places to the left making 0.0057.**

Convert the following from scientific notation to ordinary notation:

1) 6.39×10^{4} _____
2) 1.8×10^{-2} _____
3) 6.352×10^{5} _____
4) 4.9×10^{-7} _____
5) 2×10^{3} _____
6) 5.7×10^{-1} _____
7) 6.281×10^{6} _____
8) 7×10^{-5} _____
9) 6.3×10^{1} _____
10) 3.4×10^{-1} _____

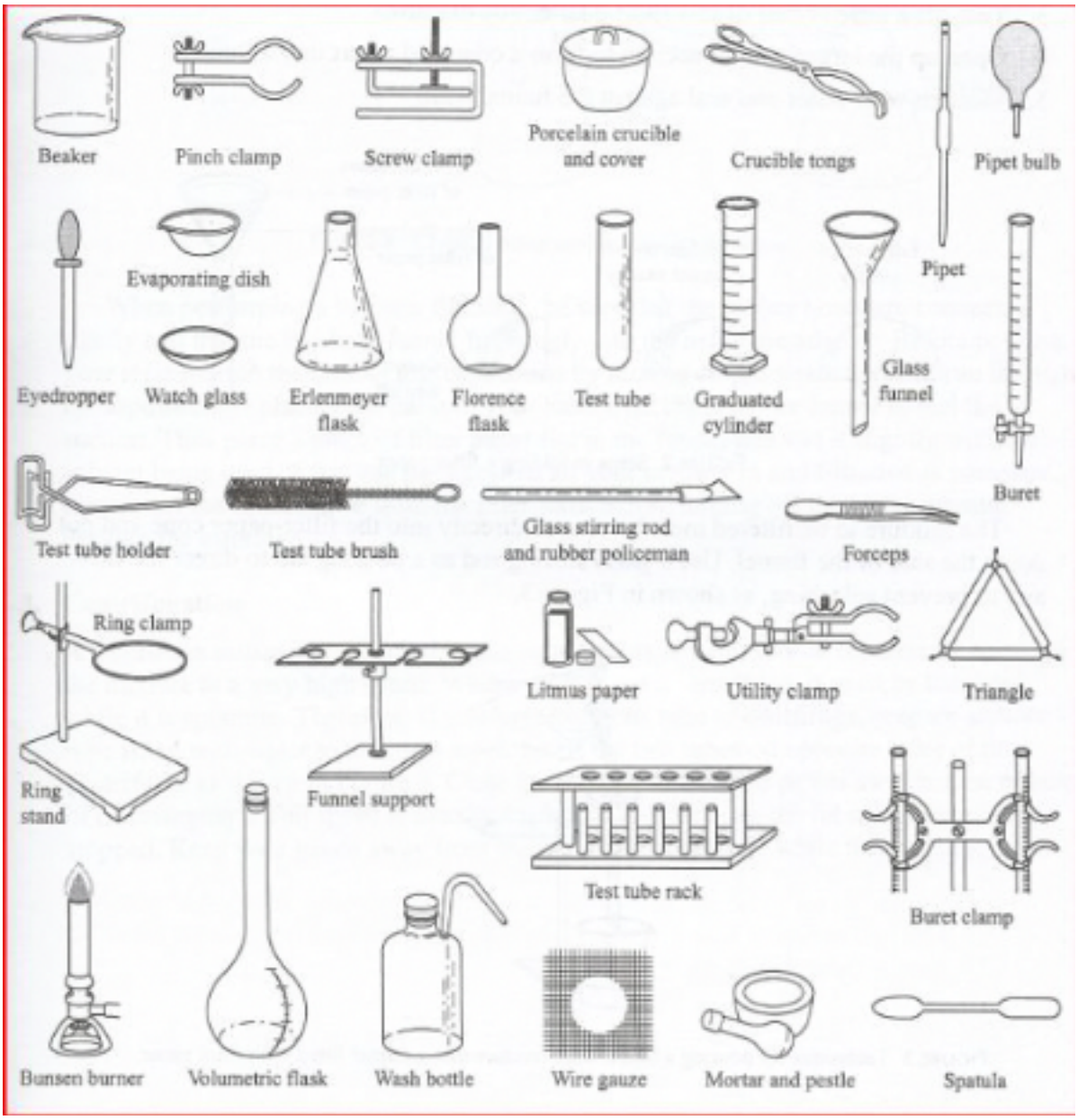
Honors Chemistry Lab Safety Rules

Check out this website!! You need to be familiar with the lab safety rules the first week of school – you will have a quiz on these rules!

Lab safety:

Google: "Flinn Scientific Lab Safety Contract" Choose – Student Safety Contract – Flinn Scientific

Video: https://www.youtube.com/watch?v=MARP5Ti33II **Lab equipment:**



Lab equipment uses: Google: "A List of Chemistry Laboratory Apparatus and Their Uses"

Choose:
"https://owlcation.com › STEM › Chemistry..."