

Chemistry Two: Summer Assignment Sheet

Start Here: Welcome! A few hints: first this summer assignment is not supposed to be some major project or anything that interferes with your summer. Honestly, I'd recommend waiting until the last few weeks of the summer and then using this to help refresh your memory before the year begins. The assignment is meant to be entirely review material apart from starting to learn the organic chemistry nomenclature and functional groups (learning these will be a huge advantage and boost your confidence going in). The assignment consists of an instructional packet handout and a worksheet packet handout as well as a lot of additional helpful stuff in the google drive shared folder (link below).

Questions? Your teacher and inspirational hero will be available by email all summer (please allow a few days for response). Chem2 IB: jerrodbardwell@smsd.org

Assignment:	Support/Instruction:
<p>STEP 1: IMPORTANT! Confirm that I have given you access to the main shared folder and "star/pin" it so it will be easy to find throughout the year. All our unit folders and materials will be posted here throughout the year. (You will need to be logged into your school goggle account to access it, email me if you need help) Extra Copies of Worksheets and PowerPoints will be posted in Google Drive. The Drive folder should be shared with your school account. Email me if you have an problems with access. Note: I may be posted some additional resources over the summer if I have time. Main Google drive folder https://drive.google.com/drive/folders/1qYVSzZLV08fZW-BjBCU_04k-pfHpfgff?usp=sharing</p>	
Chemistry One Textbook	If you would like to keep your Chemistry 1 textbook over the summer or check one out see your Chemistry 2 teacher before leaving for the summer.
Unit One: Matter Properties and change WKST	PowerPoint: Matter and Change Chem. One Notes
Unit One: Unit and measurement WKST	PowerPoint: Measurement Video: What are Sig Figs? Video: Counting Sig Figs Method A Video: Counting Sig Figs Method B Video: Doing Math with Sig Figs
Review Polyatomic/Elements	Flash Cards from Chem. One Flashcards #1 Flash Cards #2 Use the textbook mastery exams as practice
Unit One: Inorganic Nomenclature WKST	Handout: Inorganic Nomenclature Chem. One Notes PowerPoint: Ionic Compounds Molecular Compounds
Unit One: Organic Nomenclature Intro WKST	Handout: Organic Nomenclature (2) PowerPoint: Organic Nomenclature Intro
Watch Safety Video	Part 1 Part 2
Lab Equipment List	Learn names and proper spelling
Assessments (NOT part of summer assignment just a heads-up for first two weeks of school):	
Safety Quiz	Lab Safety and lab equipment (spelling counts)
Matter and Measurement Quiz	Includes: S.I. Units, conversions, and Sig Figs
Nomenclature Quiz	Includes: Element names, symbols, polyatomics, for both inorganic and organic.
Separation Lab	
Unit One Exam	Multiple Choice and Written section, including a lab practical portion for density determination, sig figs, measurement techniques and lab equipment.

Matter, Properties and Change

1. What is the difference between a compound and a mixture? Give an example of each.
2. What is the difference between a homogeneous mixture and a heterogeneous mixture? Give an example of each.
3. Which of the following mixtures are homogeneous and which are heterogeneous?
a. muddy water b. concrete c. housepaint d. a soft drink
4. Classify each of the following as a mixture or pure substance.
a. water b. blood c. the ocean d. iron e. brass f. uranium
g. wine h. leather i. sodium chloride
5. Of the pure substances in #4 which are compounds?
6. Decide whether each of the following processes is primarily a physical or a chemical change.
a. Frost forms as the temperature drops on a humid winter night.
b. A cornstalk grows from a seed that is watered and fertilized.
c. A match ignites to form ash and a mixture of gases.
d. Perspiration evaporates as you relax after jogging.
e. A silver fork slowly tarnishes in air.
7. Describe the essential features of a well-designed experiment.
8. Describe the essential features of a scientific model.

UNIT 1 – Measurement, Uncertainty, and Unit Conversion

- What is meant by the precision of a measurement? How is it indicated?
- How many significant figures are there in each of the following measurements?
 - 73.0000 g
 - 0.0503 kg
 - 6.300 cm
 - 0.80090 m
 - 5.10×10^{-7} m
 - 2.001 s
- Use scientific notation to write each of the following in terms of the SI base unit.
 - 1.07 ps
 - 5.8 μ m
 - 319 nm
 - 15.3 ms
- Write the following measurements, without scientific notation, using the appropriate SI prefix.
 - 5.89×10^{-12} s
 - 2.130×10^{-9} m
 - 0.00721 g
 - 6.05×10^3 m
- Convert:
 - 8.45 kg to milligrams
 - 318 μ s to milliseconds
 - 93 km to nanometers
 - 37.1 mm to centimeters
 - 239 Å to micrometers
 - 19.6 kg to milligrams
 - 24.8 cm to millimeters
 - 4.3 ns to microseconds
- Platinum is a metal used in jewelry and in catalytic converters. The density of Pt is 21.4 g/mL. What is the mass of a cube of platinum that is 4.40 cm on an edge?
- Do the indicated arithmetic and give the answer to the correct number of significant figures.
 - $0.871 \times 0.23/5.871$
 - $8.937 - 8.930$
 - $8.937 + 8.930$
 - $0.00015 \times 54.6 + 1.002$
- A graduated cylinder weighed 68.1 g. To the cylinder was added 48.7 g of water and 5.318 g of sodium chloride. What was the total mass of the cylinder and the solution? Express the answer to the correct number of significant figures.
- Obtain the difference in volume between two spheres, one of radius 5.61 cm, the other of radius 5.85 cm. The volume of a sphere is equal to $\frac{4}{3} \pi r^3$. Express the answer to the correct number of significant figures.

10. Describe two things which would cause systematic error and two things which would result in random error.

11. Three students measured the volume of a liquid, obtaining the following values: 15.6 mL, 16.2 mL, and 16.5 mL. Express the mean value including average, percent average, and standard deviation.

12. A student determined the density of a substance in 4 different experiments. The student obtained the following values: 12.91 g/mL; 13.55 g/mL; 13.87g/mL; 13.93 g/mL. Express the mean value including average, percent average, and standard deviation.

13. Ethanol has a density of 0.789 g/cm³. What volume must be poured into a graduated cylinder to give 19.8 g of alcohol?

14. The first measurement of sea depth was made in 1840 in the central South Atlantic, where a plummet was lowered 2425 fathoms. What is this depth in meters? Note that 1 fathom = 6 feet, 1 ft = 12 in, both exact, and 1 in = 2.54 cm.

15. The calorie, the Btu (British thermal unit), and the joule are units of energy; 1 cal = 4.184 J and 1 Btu = 252.0 cal. Convert 2.45 Btu to joules.

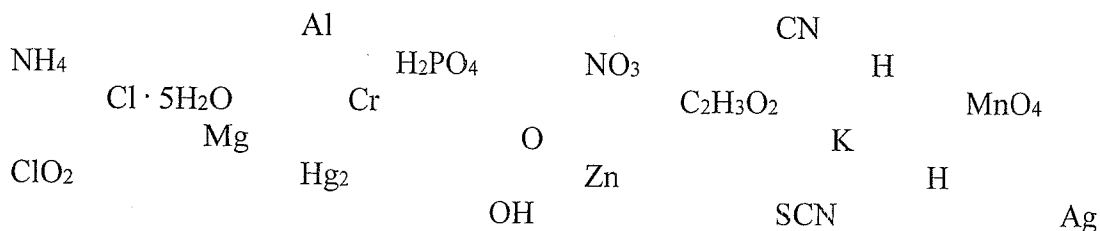
Unit 1 Worksheet – Inorganic Nomenclature

For each formula give the name of the compound and write the correct formula for each compound named

1. Ammonium phosphate
2. $K_2C_2O_4$
3. Hydrosulfuric acid
4. P_4O_{10}
5. Sodium bicarbonate
6. $Sr(ClO_4)_2$
7. Potassium permanganate
8. CH_3COOH
9. Magnesium sulfate heptahydrate
10. HNO_2
11. Silver oxide
12. $Fe_2(CO_3)_3$
13. Calcium hypochlorite
14. $Ba(OH)_2 \cdot 8 H_2O$
15. HCN

Unit 1 Create – A – Compound Worksheet

Select one of the following cations and anions and create your own compound (note: the charges have been left off). Be sure to balance the charges using the appropriate subscripts. Use all of the ions and use each ion only once.



Formula

Name

1. _____

1. _____

2. _____

2. _____

3. _____

3. _____

4. _____

4. _____

5. _____

5. _____

6. _____

6. _____

7. _____

7. _____

8. _____

8. _____

9. _____

9. _____

10. _____

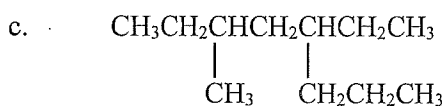
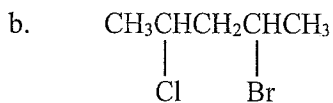
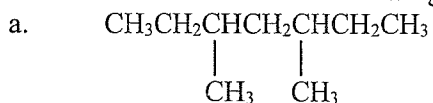
10. _____

Unit 1 Worksheet – Organic Structure and Nomenclature

1.
 - a. Give the empirical, molecular and structural formulas for the straight – chain alkanes $n = 5$ and $n = 7$.
 - b. Compare their relative boiling points and explain your reasoning.

2. Draw and name all of the possible isomers of hexane. Take care that each one you draw is actually an isomer.

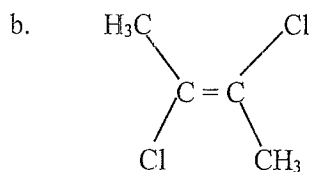
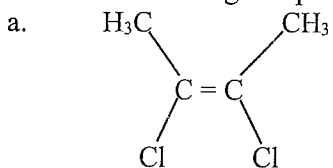
3. Give IUPAC names for the following structures.

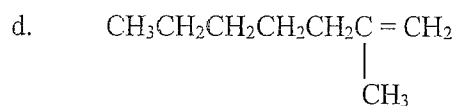
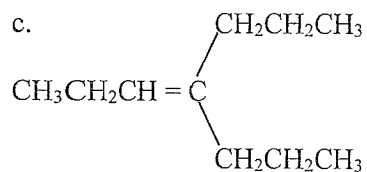


4.
 - a. 3,4 – dimethyl – 4 – ethylnonane

 - b. 2 – bromo – 1 – chlorobutane

5. Name the following compounds:





6. Draw the structural formula for each of the following compounds:

a. 3 - methyl - 2 - heptene

b. 1 - chloro - 4 - ethyl - 3 - octene

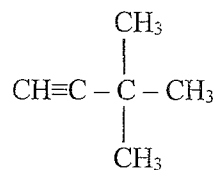
c. 2, 4 - diiodo - 3 - methyl - 1 - pentene

d. 3,4 - dibromo - trans - 3 - hexene

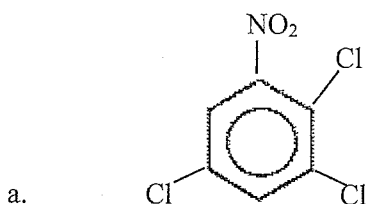
7. Name the following compounds:

a. $\text{CH}\equiv\text{C}(\text{CH}_2)_4\text{CH}_3$

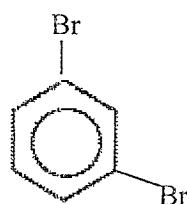
b.



8. Name the following compounds:



b.



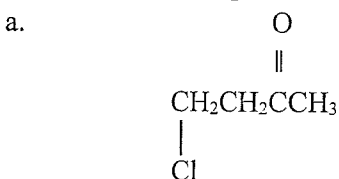
9. Draw the structure for each of the following:

a. 2, 3, 6 - triiodonitrobenzene

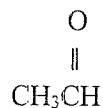
b. 2, 4 - dibromomethylbenzene
(2, 4 - dibromotoluene)

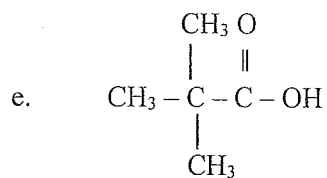
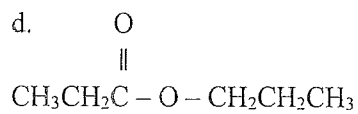
c. 4 - chloro - 2, 3 - dimethyl - 3 - phenylhexane

10. Name the following



b.





11. Write the structure for each of the following:

