

\*Test will cover **Academic Learning Targets (ALT) 1, 2, and 3**

Look over your progress report, which learning targets do you really need to focus on for the Final Exam?

	<b>ALT 1 Patterns of the Periodic Table</b>	<b>ALT 2 Atoms, Isotopes and Radioactivity</b>	<b>ALT 3 Bonding</b>	<b>ALT 7 Science Lab Abstracts/ Introduction</b>
What is my overall score in this learning target?				
<b>Highlight</b> the targets you need to increase the score on during the final exam.  How will you prepared?				Not covered in the final.  Consider revising your Precipitate Lab Summary if you scored a 1 or 2 and want to raise this grade.

### Semester Grade Calculation

The overall semester grade will be computed from scores on unit tests, the final exam score, and unit assignments (e.g. packet scores and Lab Summaries) within the learning sets for each of the academic learning targets:

ALT1, ALT 2, ALT 3, and ALT 7.

### Tips for Final Exam:

1. Bring your own marked-up copy of the Periodic Table and a Calculator.
2. I will give you a formula reference sheet.
3. You do NOT get to have notes for this exam, so make sure to complete study guide and ask questions for things that are confusing BEFORE the exam.
4. Bring 2 or more pencils with GOOD erasers.
5. No Cell Phones allowed, make sure all sounds are off, otherwise you risk getting a zero on your final.
6. This is your FINAL chance to improve your grade; you can increase your grade depending on how well you do on this exam.
7. START with the learning targets that you need to improve your score the most, in case you do not finish the exam.
8. You ONLY get the 90 minutes designated for our FINAL exam period, no more time, please make sure to pace yourself and start with the targets needing to be fixed.
9. Eat a GOOD Breakfast, and drink a lot of water (helps your brain)
10. YOU will NOT get to leave the class during the final, make sure to visit the restroom before the final, and bring what you need to the class to STAY the entire 90 minutes.

**ALT 1: Patterns in the Periodic Table**

**SUBTARGETS:**

I can communicate about the value of the concept "element" in terms of something that remains unchanged in both chemical and physical changes (Copper Cycle Lab)
I can use the periodic table as a model to predict the relative properties of groups/families of elements.
I can identify trends in the periodic table, use them to predict the relative properties of elements and explain the organization of the periodic table.

1. **Define** the following words and give an example of each one. Be able to choose examples from a list.
  - a. Element:
  - b. Compound:
  - c. Mixture:
  - d. Chemical formula:
2. How do you measure the mass of an object? What are the units of mass?
3. Explain how you use a graduated cylinder to measure the volume of an irregular solid?

<b>How can density be used to identify a substance? [Lesson 5 and Density Lab]</b>
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4. Write the formula for density:                      Density = \_\_\_\_\_  
Know how to solve problems!
- a. A piece of metal has a volume of 30.0 cm<sup>3</sup> and a mass of 252 g. What is the density of the metal **[Show your calculation & include the correct units!]**:
  
  - b. A gold ring weighs 7.50 g and has a volume of 0.388 mL. What is the density of the gold ring? **[Show your calculation & include the correct units!]**:
  - c. Is the gold ring in #5.b. made of real gold? How do you know this? Refer to the data in Table 1 to answer this question.

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<b>Metal</b>	Copper	Zinc	Gold	Lead
<b>Density (g/mL)</b>	9.0	7.1	19.3	11.4

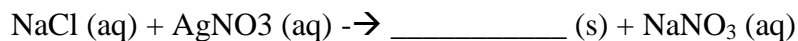
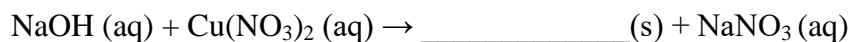
**What happens to elements and compounds in a chemical reaction? [Lessons 7 and 8]**

5. Explain in your own words what the Law of Conservation of Mass means (think about the Copper Cycle Lab, and what happened to the copper at the beginning, and end)

6. Name 3 signs that indicate a chemical change has occurred (Copper Cycle Lab!):

7. In a chemical reaction, the mass of the products \_\_\_\_\_ the mass of the reactants because of the Law of Conservation of Mass.  
A. Differs B. Equals

8. Complete the following chemical reactions. (Hint: Apply the Law of Conservation of Mass to figure out the missing chemical formulas.)



**Explain why you placed the compounds that you placed on the blank.** \_\_\_\_\_

9. Use a periodic table to answer the question, what is the correct ordering of the groups from left to right in the periodic table?

10. Use a periodic table to answer the question, which pairs of elements would you expect to have the most similar properties, and why?

- germanium, Ge, and silicon, Si
- copper, Cu, and gallium, Ga
- nitrogen, N, and oxygen, O
- hydrogen, H, and helium He

11. Use the periodic table to answer the question, which metal and which non metal have the greatest reactivity of all elements, and why?



## ALT 2: Atomic Structure

### SUBTARGETS:

I can read and analyze information texts about the small scale structure of matter to answer relevant questions.

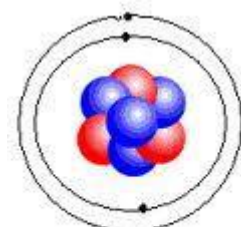
I can use models and words to compare and contrast different atomic arrangements in terms of elements, isotopes, and ions.

I can develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay

1. Fill in the following chart with the three main particles that are found in atoms:

Subatomic Particle	Charge	Mass

2. Label all the subatomic particles in the model of the atom below:



Bohr Model for a Lithium Atom

3. What is the mass of the atom in the diagram to the right? \_\_\_\_\_

4. An atom of Carbon has the atomic number 6. Fill in the following chart for Carbon:

Name	Protons	Neutrons	Electrons	Mass

5. **Isotopes** of an element differ only in the number of what subatomic particles? \_\_\_\_\_

6. The average atomic mass of lithium is 6.941 amu. Why isn't it just 7 amu? How is average atomic mass calculated?

7. Complete the table below. Assume they are neutral unless you are given evidence that they have a charge.

*Completely correct table = Highly Proficient      Mostly Filled in = Proficient*

Element	Symbol	Atomic Number	Mass Number	Protons	Neutrons	Electrons
		13	28			
Nitrogen					6	
			42			19
	$^{16}\text{O}^{2-}$					
					12	12
				17	19	18

LT2c Radioactivity

**Vocabulary:** Define the following terms using your *Living By Chemistry* textbook.

Alpha decay (p. 74)

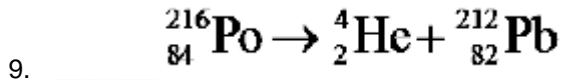
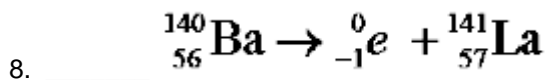
Alpha particle (p. 74)

Beta decay (p. 75)

Beta particle (p. 75)

**Questions 8-9:** Identify the following reactions using the letter of the type of nuclear reaction listed below:

a) alpha decay      b) beta decay



10. How are radioactive elements different from stable elements?

11. Fill in the blanks for the following nuclear equations. Use your periodic table.

Type of decay	Reaction
Alpha decay	${}^{192}\text{Ir} \rightarrow \text{_____} + \text{_____}$
Beta decay	${}^{102}\text{Ru} \rightarrow \text{_____} + \text{_____}$



10. Which of the following ions have the correct charge? Choose all that apply. **FIX the ones that are wrong.**

- f.  $\text{Na}^{2+}$    b.  $\text{Li}^+$    c.  $\text{Al}^{4+}$    d.  $\text{Ca}^{2+}$    e.  $\text{Ga}^{3+}$

\_\_\_\_\_

11. Explain why the following compound does not form,  $\text{CaCl}$ .

12. Predict the formulas for ionic compounds between the following metal and nonmetal elements. Name each compound.

- a. Al and Br \_\_\_\_\_   b. Al and S \_\_\_\_\_   c. Al and As \_\_\_\_\_  
 d. Na and S \_\_\_\_\_   e. Ca and S \_\_\_\_\_   f. Ga and S \_\_\_\_\_

13. For each compound, write the cation and anion with the appropriate charge. Then write the chemical formula for each compound.

**The first row is completed as an example: sodium fluoride.**

Name	Cation	Anion	Formula
<i>Sodium fluoride</i>	$\text{Na}^+$	$\text{F}^-$	<i>NaF</i>
14. Magnesium oxide			
15. Aluminum chloride			
16. Strontium iodide			

17. Predict whether or not Magnesium chloride will conduct electricity. \_\_\_\_\_  
 Will it melt quickly or slowly? \_\_\_\_\_

18. Predict whether or not Ammonium chloride will conduct electricity. \_\_\_\_\_  
 Will it melt quickly or slowly? \_\_\_\_\_

19. Use your periodic table and the table of polyatomic ions to fill in the missing parts of the following table.

Name	Cation	Anion	Formula
<i>Sodium hydroxide</i>	$\text{Na}^+$	<i>OH</i>	<i>NaOH</i>
20. Magnesium sulfate			
21. Ammonium oxide			
22. Strontium phosphate			
23. lithium carbonate			