

Semester 1 Final Review*Prep*

- Convert between standard form and scientific notation.
 - $89,000,000 =$ _____
 - $0.00056 =$ _____
 - $4.5 \times 10^{-8} =$ _____
 - $2.7 \times 10^4 =$ _____
- Convert between the units indicated.
 - $35 \text{ cm} =$ _____ m
 - $280 \text{ mL} =$ _____ L
 - $0.0068 \text{ ms} =$ _____ μs
 - $1400 \text{ mg} =$ _____ kg
- Complete the following temperature conversions.
 - _____ $^{\circ}\text{C} = 300^{\circ}\text{F} =$ _____ K
 - $-20^{\circ}\text{C} =$ _____ $^{\circ}\text{F} =$ _____ K
- Complete the following conversions.
 - $8.25 \text{ km} =$ _____ miles
 - $6.5 \times 10^4 \text{ cm}^2 =$ _____ $\text{in}^2 =$ _____ m^2
- A gold block measures 1.50 cm by 1.00 cm by 0.900 cm.
 - What is the volume of the block?
 - What is the density of gold?
 - What is the mass of the block?
- A graduated cylinder contains 50 mL of water. When a small stone is placed in the graduated cylinder the water level rises to 55 mL. If the stone weights 20 g, what is the density?
- Determine the number of protons, electrons, and neutrons in each of the following.
 - Cr
 - Br^-
 - Sr^{2+}

Name: _____ Per _____

8. Draw a Bohr Diagram for the following elements. Include the number of protons, electrons, and neutrons.
 - a. N

 - b. Ca

9. Chromium has four isotopes: Chromium-50 (4.35 %), chromium-52 (83.7%), Chromium-53 (9.50 %), and chromium-54 (2.37%).
 - a. Determine the number of neutrons in each isotope.

 - b. Determine the average atomic mass of Chromium

10. Write orbital notation for the following elements/ions.
 - a. Si

 - b. V

 - c. S^{2-}

11. Write electron configuration for the following elements/ions.
 - a. Cl

 - b. Ge

 - c. Y^{3+}

12. Write noble gas notation for the following elements/ions.
 - a. Rb

 - b. Sc

 - c. I⁻

13. Determine the number of valence electrons in each of the following elements:
 - a. S
 - b. Ca
 - c. Ar

Name: _____ Per ___

14. Complete the following table.

	Na or P?	Li or K?
Bohr Diagram	Na: P:	Li: K:
Which element has a larger atomic radius? Explain.		
Which element has a higher ionization energy? Explain.		
Which element has a higher electronegativity? Explain.		

15. Which has a larger radius, the atom or the ion? Explain.

a. P or P^{3-}

b. Zr or Zr^{4+}

16. For each molecule: 1. Draw the Lewis Structure. 2. Draw the VSEPR diagram and classify the shape of the molecule.

a. OF_2	b. PF_3
c. PH_3	d. CBr_4
e. SF_6	f. BF_3

Name: _____

Per ____

g. CS ₂	h. H ₂ O
--------------------	---------------------

17. Classify the following substances as mixtures or pure substances. Classify whether each mixture is heterogeneous or homogeneous and whether each pure substance is a compound or element.

Substance	Classification
A taco	
Salt	
Sliver	
Chocolate milk	

18. Name the following compounds.

a. LiCl	_____	b. H ₂ CO ₂	_____
c. MgCO ₃	_____	d. FePO ₄	_____
e. CuS	_____	f. CCl ₄	_____
g. NiCl ₃	_____	h. HBr	_____
i. N ₂ O ₅	_____	j. MnO ₂	_____

19. Write the chemical formula for the following compounds.

a. sodium sulfide	_____	b. cobalt (II) chloride	_____
c. lithium carbonate	_____	d. scandium borate	_____
e. chromium (III) oxide	_____	f. sulfur hexafluoride	_____
g. nitrogen dioxide	_____	h. hydroiodic acid	_____
i. iodic acid	_____	j. lead (IV) sulfide	_____

20. Determine the molar mass of the following elements/compounds

a. phosphorous	b. chlorine	c. calcium fluoride	d. MgCO ₃
----------------	-------------	---------------------	----------------------

21. Complete the following mole conversions.

a. 0.25 mol Al = _____ g Al

b. 45 g NaCl = _____ mol NaCl

c. 2.25×10^{23} atoms Au = _____ mol Au

Name: _____ Per _____

d. 220 g magnesium chloride = _____ molecules of magnesium chloride

e. 5.0×10^{24} molecules of potassium phosphate = _____ kg of potassium phosphate

22. If there are 400 molecules of water, how many atoms are there of hydrogen and oxygen?

23. Calculate the percent composition of each element in the following compounds.

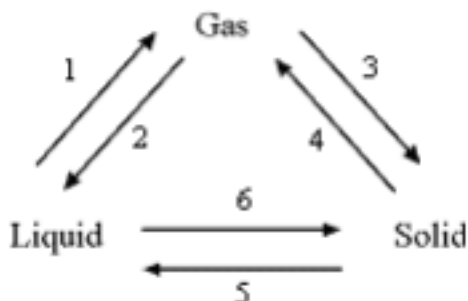
a. Na_2S

b. Silver nitrate

24. Compare the phases of matter.

State	Molecular Motion	Molecular spacing	Spread to fill a container?	Compressible?
Solid				
Liquid				
gas				

25. Complete the following diagram by labelling the phase change.



26. Classify each of the following changes as chemical or physical and explain why with a piece of evidence.

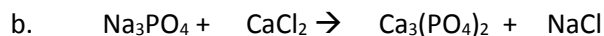
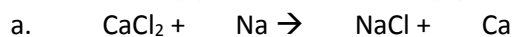
Change	Classification	Explanation
a. When heated, calcium carbonate decomposes into calcium oxide and carbon dioxide		

Name: _____

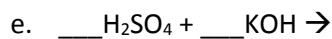
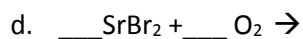
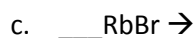
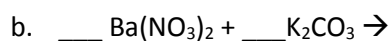
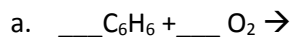
Per _____

b. copper metal is stretched into a wire		
c. a popsicle is frozen		
d. a banana turns brown over time		

27. Classify the reactions as synthesis (S), decomposition (D), Single replacement (SR), Double Replacement (DR), Combustion(C), or Neutralization (N). Then balance the chemical equation.



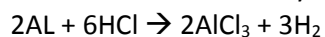
28. Classify the reactions as synthesis (S), decomposition (D), Single replacement (SR), Double Replacement (DR), Combustion(C), or Neutralization (N). Predict the products and then balance the chemical equation.



Name: _____ Per _____

29. Copper reacts with sulfuric acid to produce copper (II) sulfate, water, and sulfur dioxide. Write a balanced chemical equation for this reaction.

30. Aluminum reacts with hydrochloric according to the following balanced chemical equation:

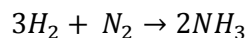


a. If 0.250 mol of Al reacts, determine the moles of H₂ produced.

b. If 5.0 mol of AlCl₃ are produced, determine the moles of HCl reacting.

c. If 50.0 g of Al react, what mass of HCl is required?

31. Ammonia (NH₃), is prepared by combining hydrogen and nitrogen according to the following balanced chemical equation:



a. When 28 g of nitrogen are reacted, what mass of hydrogen is required?

b. What mass of ammonia is produced?