

Name _____ Date _____ Period _____

Unit 1 Exam Review

Multiple Choice

- Who conceived the basic principles of atomic theory?
 - Avogadro
 - Bohr
 - Dalton
 - Rutherford
- Atoms of the same element may differ in their _____.
 - Chemical properties
 - Mass number
 - Atomic number
 - Number of protons and electrons
- Dalton's atomic theory helped to explain the law of conservation of mass because it stated that atoms _____.
 - Could not combine
 - Were invisible
 - All had the same mass
 - Could not be created or destroyed
- In Rutherford's experiment, a small percentage of the positively charged particles bombarding the metal's surface _____.
 - Were slightly deflected as they passed through the metal
 - Were deflected back toward the source from the metal
 - Passed straight through the metal
 - Combined with the metal
- Which of the following makes up the majority of the volume of an atom?
 - nucleus
 - nuclides
 - electron cloud
 - protons
- Which statement best describes the density of an atom's nucleus?
 - The nucleus occupies most of the atom's volume but contains little of its mass.
 - The nucleus occupies very little of the atom's volume but contains most of its mass.
 - The nucleus occupies very little of the atom's volume and contains little of its mass.
 - The nucleus occupies most of the atom's volume and contains most of its mass.
- Which of the following alkali metals reacts most violently with water?
 - Cesium
 - Sodium
 - Lithium
 - Potassium
- Which of the following elements has chemical properties most similar to that of Sulfur?
 - Hydrogen
 - Oxygen
 - Fluorine
 - Phosphorous

Fill in the Blank

9. Name the following elements:

_____ Cr	_____ K	_____ Au
_____ Fe	_____ Na	_____ Be
_____ B	_____ Cu	_____ P
_____ Li	_____ Co	_____ Sr

10. The amount of a substance that contains a number of particles equal to the number of atoms exactly 12g of carbon-12 is referred to as a(n) _____.

11. _____ is the halogen in the 4th period.

12. _____ is an isotope of hydrogen that is the most common on Earth.

13. Isotopes differ in atomic mass because they have different numbers of _____.

14. The only non-metal in group 14 is _____.

15. _____ is a property of metals that allows them to be hammered and reshaped.

16. Iron has an atomic number of _____ and an atomic mass of _____.

17. Based on its position in the periodic table, Beryllium is classified as a(n) _____.

18. Complete the following table:

Hyphen Notation	Symbol Notation	Atomic #	Mass #	# of protons	# of neutrons	# of electrons
Potassium-40						
Cobalt-60						
		6	14			
	${}^{66}_{30}\text{Zn}$					
					134	84

Calculations

19. How many total neutrons are present in 1.28 moles of nickel-60 atoms? Provide your answer in scientific notation and with the proper number of significant figures.

20. What mass of calcium contains 5.38×10^{24} atoms? Write your answer with the proper number of significant figures.

21. You exhale 11.74g of CO_2 into a balloon. How many molecules does your balloon contain? Provide your answer in scientific notation and with the proper number of significant figures.
22. You pour 13.9 kg of sodium chloride, NaCl into your swimming pool. How many moles of NaCl did you put into the pool? Write your answer in scientific notation and with the proper number of significant figures.
23. What mass of Magnesium metal contains the same number of atoms as 129.3 grams of Carbon? Write your answer with the proper number of significant figures.

24. Answer the questions regarding the following reaction:



- a) Label the reactants and the products.
- b) Which law is satisfied when this equation is balanced?
- c) What is the molar mass of AlCl_3 ?
- d) If 42.9 g of AlCl_3 are produced, how many moles of AlCl_3 are produced? Write your answer with the proper number of significant figures.
- e) What is the molecular mass of Al_2O_3 ?
- f) What is the ratio of Al : O in Al_2O_3 , aluminum oxide?
- g) Which law ensures that the ratio of Al : O in aluminum oxide, Al_2O_3 will always remain the same?

25. Write each of the following measurements in scientific notation.

1501 kg _____

0.0037 nm _____

256,000,000 cm³ _____

0.152 mL _____

26. Write each of the following measurements in expanded notation.

3.85×10^{-3} _____

8.889×10^9 _____

1.2365×10^1 _____

1.79×10^0 _____

27. How many significant figures are there in each of the following values?

_____ 0.00980601

_____ 490

_____ 80000.

_____ 4001.009

28. How many milliseconds are there in a leap year? (Hint: There are 366 days in a leap year.) Write your answer with the proper number of significant figures.

28. 3.16×10^{10} msec
27. 6; 2; 5; 7
26. 0.00385; 8,889,000,000; 12.365; 1.79
25. 1.501×10^3 kg; 3.7×10^{-3} nm; 2.56×10^8 cm³; 1.52×10^{-1} mL
- g. Law of Definite Proportions
- f. 2:3
- e. 101.96 amu
- d. 0.322 mol
- c. 133.3 g/mol
- b. Law of Conservation of Mass
- a. left side of arrow is reactants; right side is products
- 24.
23. 261.7 g Mg
22. 2.38×10^2 mol
21. 1.606×10^{23} molecules
20. 358 g Ca
19. 2.47×10^{25} neutrons

Hyphen Notation	Symbol	Atomic #	Mass #	# of protons	# of neutrons	# of electrons
Potassium-40	⁴⁰ K	19	40	19	21	19
Cobalt-60	⁶⁰ Co	27	60	27	33	27
Carbon-14	¹⁴ C	6	14	6	8	6
Zinc-66	⁶⁶ Zn	30	66	30	36	30
Polonium-218	²¹⁸ Po	84	218	84	134	84

- 18.
6. B
5. C
4. B
3. D
2. B
1. C
- Answer Key:
7. A
8. B
9. See periodic table
10. Mole
11. Bromine
12. Protium

13. Neutrons
14. Carbon
15. Malleability
16. 26; 55.85 amu
17. Alkaline earth metal