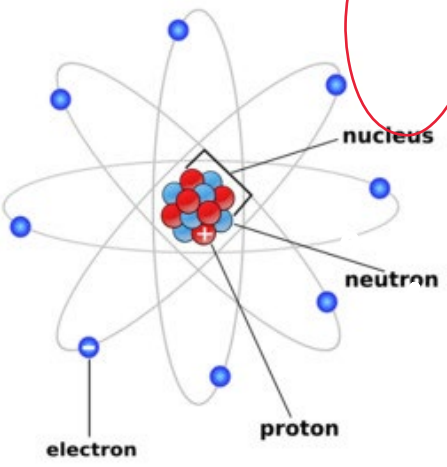
Unit 1: Chemistry

REVIEW

"Practice Test"

Science 10

Key



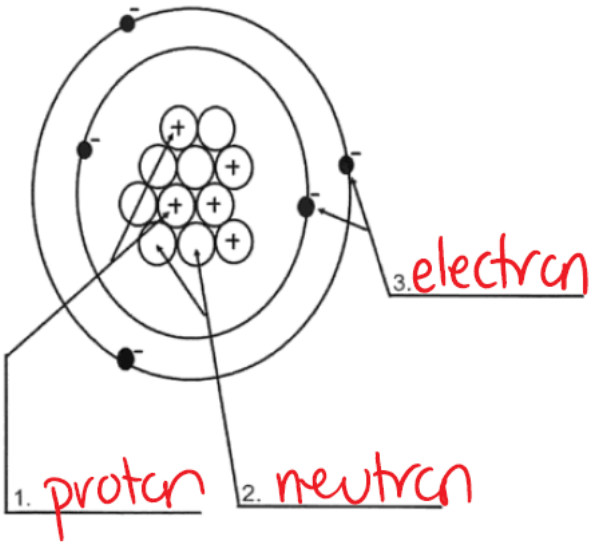
Name: _____ **Date:** _____

PART 1: Atomic Structure & Bonding

Vocabulary: Referring to your notes, define each of the following vocabulary terms in a complete sentence.

1. **atom**	The smallest particle of an element, which still has properties of the element.
2. **atomic charge**	The overall charge of an atom. Found by subtracting the number of protons and electrons
3. **atomic number**	The total number of protons in the nucleus of an element (unique to every element).
4. **Bohr model**	A diagram showing the number of protons and neutrons in the nucleus of an atom, and electrons as dots around the nucleus.
5. **electron**	The subatomic particle with +1 charge and no mass. Located orbiting around the nucleus.
6. **mass number**	The total mass of an atom. Found by adding up the number of protons and electrons.
7. **neutron**	The subatomic particle with no charge and mass of 1. Found in the nucleus to hold protons together.
8. **proton**	The subatomic particle with +1 charge and mass of 1. Located in the nucleus.
9. **standard atomic notation**	A way of writing the element's symbol, mass number, and atomic number (mass # / atomic # / symbol)
11. **valence shell**	The outermost shell in an atom. Electrons in this shell participate in chemical reactions.

Label the parts of an atom on the diagram below.



4. What type of charge does a proton have? positive (+)

5. What type of charge does a neutron have? no charge Ø

6. What type of charge does an electron have? negative (-)

7. Which two subatomic particles are located in the nucleus of an atom? proton and neutron

10.. **Answer the questions for the elements shown below. Complete the Periodic Table box by filling in the element name or symbol.**

8	30	3
O	Zn	Li
oxygen	Zinc	Lithium
15.999	65.39	6.941

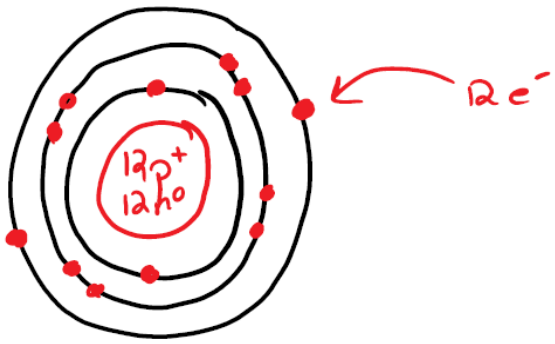
Atomic # = 8	Atomic # = 30	Atomic # = 3
Atomic Mass = 16	Atomic Mass = 65	Atomic Mass = 7
# of Protons = 8	# of Protons = 30	# of Protons = 3
# of Neutrons = 16-8=8	# of Neutrons = 65-30=35	# of Neutrons = 7-3=4
# of Electrons = 8	# of Electrons = 30	# of Electrons = 3

Complete the following table.

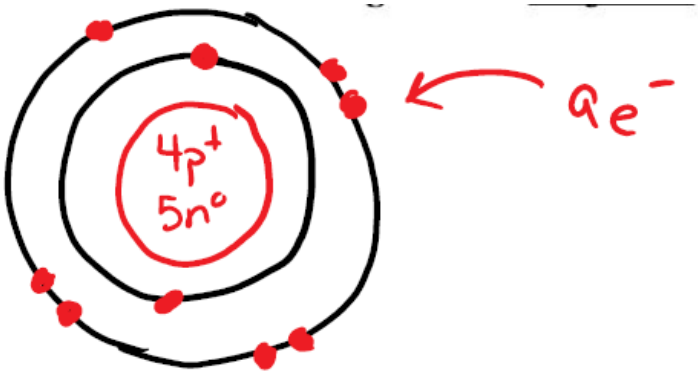
Element Name	Element Symbol	Number of Electrons if Neutral	Atomic Number	Group #	Number of Protons	Average Atomic Mass	Period #
Phosphorus	P	15	15	15	15	31.0	3
Zinc	Zn	30	30	12	30	65.4	4
Barium	Ba	56	56	2	56	137.3	6
Strontium	Sr	38	38	2	38	87.6	5
Chlorine	Cl	17	17	17	17	35.5	3
Titanium	Ti	22	22	4	22	47.9	4

14. **Draw a Bohr model diagram of a**

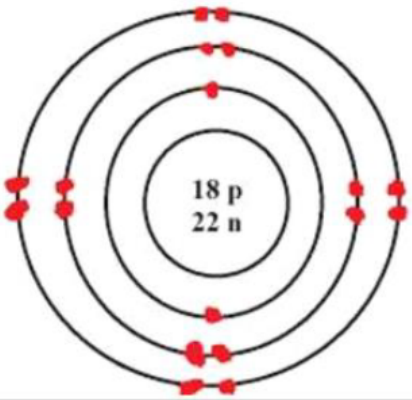
***a) magnesium* atom.**

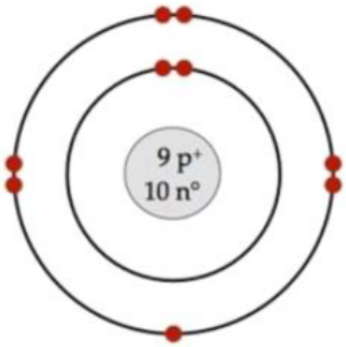


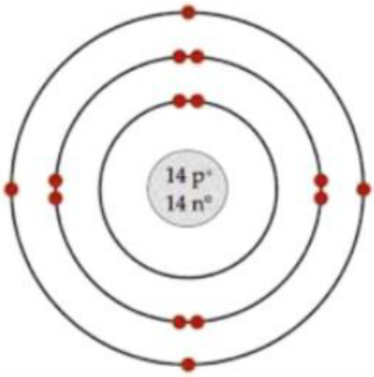
b) *beryllium* atom



16. **Write the name of the Atom shown in each Bohr Diagram in the box below:**







Argon (Ar)	Fluorine (F)	Silicon (Si)

17. **Identify the number of electrons in the valence shell of the following atoms.**

potassium	1	aluminum	3
hydrogen	1	oxygen	6
argon	8	chlorine	7
boron	3	beryllium	2

18. **Which family of elements has atoms with filled valence shells? What does this mean for their reactivity?**

The Noble Gases have full valence shells. This means they DO NOT react (inert gases).

PART 2: Names of Formulas + Compounds + Chemical Reactions

11.

	Reactants	Name	Formula
(a)	sodium and nitrogen	sodium nitrate	Na_3N
(b)	magnesium and oxygen	magnesium oxide	MgO
(c)	aluminum and sulphur	aluminum sulfide	Al_2S_3
(d)	gallium and fluorine	gallium(III) fluoride	GaF_3
(e)	silver and selenium	silver selenide	Ag_2Se
(f)	zinc and chlorine	zinc chloride	$ZnCl_2$

18.

	Formula	Ionic or Covalent?	Name of Compound
(a)	$CaCl_2$ (metal)	ionic	calcium chloride
(b)	$CuCl_2$	ionic	copper(II) chloride
(c)	SCl_2 (non-metals)	covalent	sulfur dichloride
(d)	CoS	ionic	cobalt (II) sulfide

7. **Distinguish between physical and chemical changes.**

- Physical changes are those which change the appearance or state, but do not result in the creation of any new substances. (ex: ice cube melting)
- Chemical changes always result in the creation of a new substance, and are irreversible (ex: rust forming)

8. **Classify each of the following as either a physical or a chemical change.**

Chopping wood with an axe. PHYSICAL

Burning wood in a campfire. CHEMICAL

Baking bread in an oven. CHEMICAL

Chocolate bar melting in the sun. PHYSICAL

Exploding dynamite. CHEMICAL

Apple rotting on the ground. CHEMICAL

CHAPTER 4 Chapter 4 Quiz

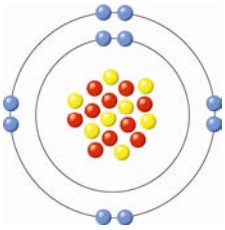
Goal • Check your understanding of Chapter 4.

What to Do

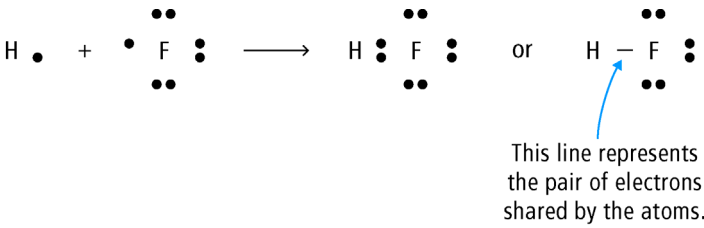
Circle the letter of the best answer.

1. Which subatomic particle(s) make up most of the mass of an atom?
   A. electrons
   B. neutrons
   C. electrons and protons
   D. neutrons and protons

2. Which statement best describes the diagram to the right?
   A. This is a Bohr diagram that shows eight neutrons.
   B. This is a Lewis diagram that shows eight neutrons.
   C. This is a Bohr diagram that shows ten neutrons.
   D. This is a Lewis diagram that shows ten neutrons.



3. Which statement best describes the following diagram?



   A. The pure substance is an element, and the line refers to a charge of 1–.
   B. The pure substance is a compound, and the line refers to a charge of 1–.
   C. The pure substance is an element, and the line refers to a pair of bonding electrons.
   D. The pure substance is a compound, and the line refers to a pair of bonding electrons.

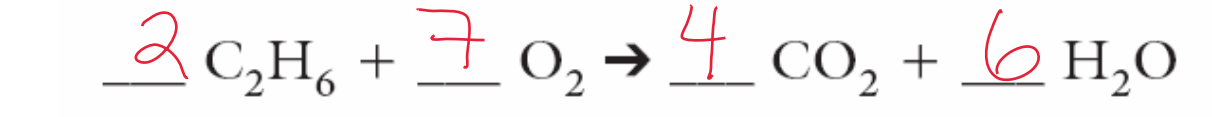
4. What is the name of PbO_2?
   A. lead(II) dioxide
   B. lead(IV) oxide
   C. lead dioxide
   D. phosphorus boron oxide

5. What is the correct formula for aluminum hydroxide?
   A. Al_3OH
   B. $AlOH_3$
   C. $Al(OH)_3$
   D. $Al(OH_3)$

6. Which statement best describes $(NH_4)_2Cr_2O_7$?
   A. It is an ionic compound with 16 atoms in total.
   B. It is an ionic compound with 19 atoms in total.
   C. It is a covalent compound with 16 atoms in total.
   D. It is a covalent compound with 19 atoms in total.

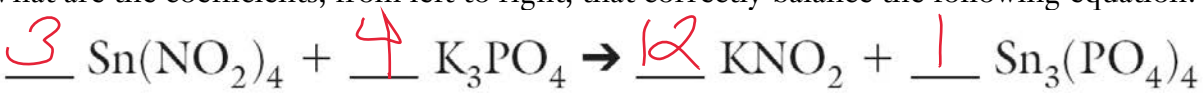
7. What is the charge on the plutonium atom (Pu) in the compound Pu_2O_5?
   A. 3+
   B. 4+
   C. 5+
   D. 6+

8. What are the coefficients, from left to right, that correctly balance the following equation?



   A. 1, 3, 2, 3
   B. 1, 7, 2, 3
   C. 2, 7, 4, 6
   D. 2, 3, 4, 6

9. What are the coefficients, from left to right, that correctly balance the following equation?



   A. 3, 4, 12, 1
   B. 3, 3, 6, 1
   C. 6, 3, 4, 2
   D. 6, 4, 2, 12

10. Which statement best describes the following equations?

I.	$CO_2 + H_2O \rightarrow C_6H_{12}O_6 + O_2$
II.	$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

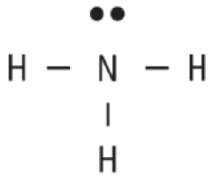
   A. I is a word equation, and II is a skeleton equation.
   B. I is a skeleton equation, and II is a balanced equation.
   C. I is a balanced equation, and II is a word equation.
   D. I is a skeleton equation, and II is a word equation.

Match the Term on the left with the best Descriptor on the right.
Each Descriptor may be used only once.

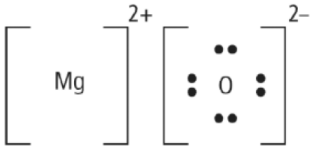
Term	Descriptor
E 11. binary covalent compound	A. PO_4^{3-}
A 12. polyatomic ion	B. Br_2
G 13. ionic compound	C. substance made during a reaction
B 14. element	D. equal to the number of protons in an atom
D 15. atomic number	E. CH_4
F 16. reactant	F. substance consumed during a reaction
	G. $MgCl_2$
	H. equal to the number of neutrons in an atom

Short Answer Questions

17. (a) Draw a Lewis diagram representing ammonia (NH_3).



(b) Draw a Bohr diagram representing MgO.



18. Write the formula or name of the following compounds.

(a) iron(III) chloride $FeCl_3$

(b) ammonium phosphate $(NH_4)_3PO_4$

(c) dinitrogen trisulphide N_2S_3

(d) P_4O_{10} **tetraphosphorus decaoxide**

(e) Na_2SO_4 **sodium sulphate**

19. Balance the following equations.

(a) $3KI + AlCl_3 \rightarrow 3KCl + AlI_3$

(b) $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$