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/	(1/2011)	
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<u> Unit 3 : Atomic Structure and Periodic Properties Practice</u>

Metals, Nonmetals, and Metalloids: Know where they are found on the periodic table

Type of Atom	Characteristics		
Metal	Left of p.t.; Luster, Malleable, Ductile, Mostly Solids, High densities, Conduct Heat/Electricity		
Nonmetal	Right of p.+; Brittle, Low densities, Do not conduct Heat/Electricity		
Metalloid	Some props of metals + nonmetals; semi conductors		

THROWBACK TO UNIT 2: Complete the table below regarding states of matter.

States of Matter Characteristics				
	Particle Diagram (What it looks like)	Motion (Relative Speed)	Shape and Volume	Density (High, Medium, Low)
Solid		Low/510w	Defined	High
Liquid	0,0,0,000000°	Moderate	Definite volume but Δ's shape	Medium
Gas	91 /11 /19	Fast	Takes shape + volume of container	Low

In general, how are electrons arranged around the nucleus of an atom?

Atom
Energy Cenels

What causes an atom to be neutral?

Protons = Electrons

Convert: 450 nm to meters

450nm 10-9 m = 4.5×10 m

Using the table to the right, answer the questions below: Which group has a predicted charge of O?	
An element from which group gains 1 electron when it forms its common ion?	D
To This its common ion?	
AB	B
Which group possesses the most reactive metals?	E lever
And the second of the second o	Agus Lugaria a Nilae i
Which group(s) has/have metals that can form multiple charges?	Named (Figure 2 2 2 3 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
How many valence electrons do the following elements have a. Oxygen (O) b. Carbon (C)	c. Sodium (Na) 1 d. Bromine (Br) 7
Match the group of elements with the correct description of 1. Alkali Metals 2. Noble Gases 4. Halogens 2. Colorless gases; completely unreactive; 8 valence elected 3. Harder than Group 1 elements; very reactive; 2 valence 4. HIGHLY reactive; soft metals; 1 valence electron 4. HIGHLY reactive; three gases, a liquid, and a solid; 7 valence the answer choices in the question above (1-5), labels	etals 5. Transition Metals ectrons ce electrons valence electrons
3	
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Parts of an Atom

1. Complete the table below.

Subatomic Particle	Charge	Relative Mass	Location in the Atom	
Proton	+		Nudeus	
Neutron	D WARRE		Nucleus	
Electron	- 1	almost Ø	Energy Levels	

2. Which subatomic particles are responsible for giving an atom its mass? Where are these particles located?

Protons + Neutrons

Nucleus

3. Look at how the periodic table is arranged. What number is used to determine the order of the elements?

(What is it CALLED, not where is it located)

Atoms, lons, and Isotopes

4. How does an atom become an ion?

+/- electrons hotes me tras not forth galogrelan multi as todas ons weed

- 5. Circle the correct choice to complete the sentences below.
 - a. Sulfur must (gain/lose) electrons to become S-2. S-2 is an example of a (cation/anion).
 - b. Calcium must (gain/lose) electrons to become Ca⁺². Ca⁺² is an example of a (cation/anion).
 - c. If an two atoms of the same element have different masses, then they are called (isotopes) ions/atoms) and they have different numbers of (protons/neutrons/electrons).
- 6. Determine the mass number of an atom with 9 protons, 12 neutrons, and 9 electrons. Write the isotopic symbol for this atom.

 P=E so no charge
- 7. Explain the difference between mass number and average atomic mass.

One atom/isotope All isotopes of that element

8. Identify each number in the isotope symbol below. How many protons, neutrons, and electrons are present?

Mass# 36 Cl 1- P= 17 17 Cl 2 N= 19 Charge E = 18

13. In the flame test lab, what determined the color of the flame?

Wavelength of light emitted

14. Why don't elements in group 18 form ions?

They already have 8v.e. (full valence level)
so no need to gain/lose electrons

 Predict the charge (you will NOT have your colored periodic table on the test) of each ion and complete the table below.

Element	Symbol	# Protons	# Electrons	# Valence Electrons	Charge of Common Ion Formed	Cation/Anion?
Lithium	Li	3	3	1	+1	C
Chlorine	८।	17	17	7	- 1 3	A
Phosphorus	P	15 tanky	15 71313	i grave s ol aldir	-3	A
Calcium	Ca	20	20	a	+2	Colle
Aluminum	AI	13	13	3	+3	C

15. Draw and label an atom undergoing absorption and emission of energy and display what can happen to one of its electrons as this happens. Label the ground and excited states of the electron. Then, list each of the steps in chronological order.

2-E absorbs energy +
mones to excited state
3-E falls back to ground
4-Energy emitted

16. A student hypothesizes that feeding an adult goldfish more than once a day will make it grow larger. He keeps three adult goldfish in separate 40-liter tanks at 20°C for four weeks. He feeds the first goldfish once a day, the second goldfish twice a day, and the third goldfish three times a day.

In this experiment:

- What was the independent variable? # of feedings

- What was the dependent variable? Fish growth

- What is one variable that was kept constant? 40-L, 20°C, Fish Type, etc.

- If the data at the end of his experiment were graphed, would you use a bar graph or a line graph? Explain why:

Bar - 3 sets of data separately

17. Why might noble gases be used in reaction chambers where chemicals could combust (burn)?

They are nonneactive

18. What is the ONLY situation where an atom could change its atomic number (number of protons)?

Nuclear Decay