

Unit 4

NAME

Class Work

11/25/13

## 4.5 Organization of the Periodic Table

### SPARK:

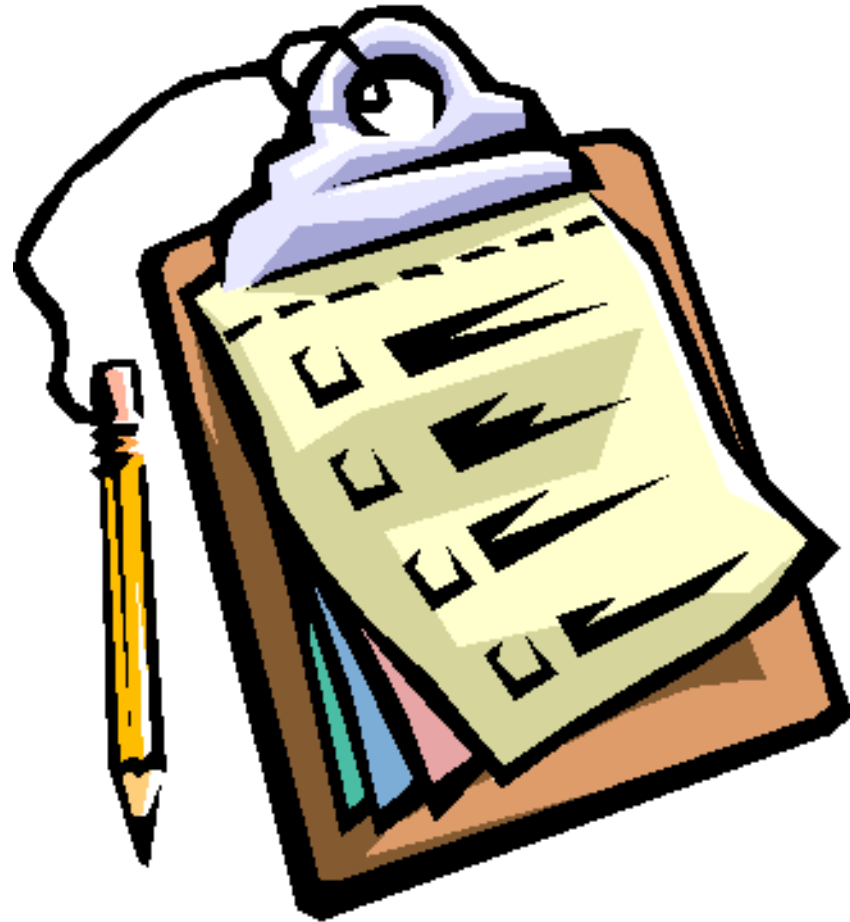
1. What are valence electrons?
2. What is the Bohr Model for calcium?
3. Draw the Lewis Dot diagram for Neon

## Objective

SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Agenda:

- Do Now/Objective
- Quiz
- Thought Provoker
- Mini Lesson
- Classwork
- Homework



Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# QUIZ TIME!

- 8 minutes!

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Thought Provoker

- **OBJECT:**
- What are at least two adjectives you could use to describe the object in front of you?
- Do you think your object will get hot quickly if put over a flame?
- Would it be easy to take your object and make other things out of it like tools, pots, cups, etc?
- Describe two ways that your object is different from another object that your classmates have.

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Vocab Refresher

- Which member of group 13 is found in the second period?

(1) Be

(2) Mg

(3) B

(4) Al

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# *Periodic Table Pass Out!*

## Mendeleev

- In 1869, Dmitri Ivanovitch Mendeléeiev created the first the periodic table.
- Elements were grouped according to their atomic mass.
- He found that the groups had similar chemical properties.
- Blank spaces were left open to add the new elements he predicted would occur.



Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Organization of the Periodic Table

The diagram illustrates the periodic table with elements represented as colored blocks. The table is organized into three main categories:

- Metals:** Indicated by a green color and a diagonal line pointing to the left side of the table (groups 1-12).
- Nonmetals:** Indicated by an orange color and a diagonal line pointing to the right side of the table (groups 13-18).
- Metalloids:** Indicated by a purple color and a diagonal line pointing to the elements along the boundary between metals and nonmetals (groups 13-16, periods 3-6).

The periodic table is shown with rows numbered 1 to 7 and columns numbered 1 to 18. The elements are arranged in a grid, with the Lanthanide and Actinide series shown as separate rows at the bottom.

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Metals

- Metals\*\* are elements that are shiny, solid at room temperature, and good conductors of heat and electricity

Examples: Copper (Cu)

and

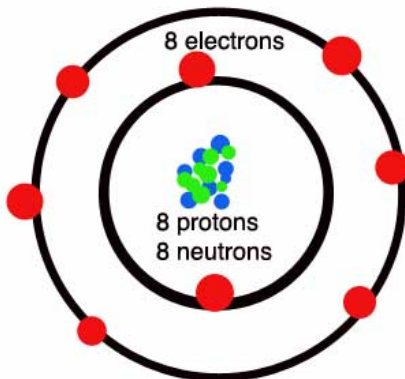
Gold (Au)



Objective: SWBAT to classify an element as a metal, nonmetal, or metalloid based on its properties and location on the periodic table.

# Non Metals

- Non-metals\*\* are generally gases or dull looking solids. Poor conductors of heat and electricity
- Examples: Oxygen (O) and Carbon (C)



Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Metallic VS Nonmetallic Properties

<u>METALS</u>	<u>NONMETALS</u>
<ul style="list-style-type: none"><li>•Shiny!</li><li>•Malleable/Bendable</li><li>•Conducts Electricity</li><li>•REACTS w/ ACID</li><li>•Usually SOLID at room temp. (EXCEPTION: Mercury (Hg) is liquid at room temp)</li><li>•Examples: Copper (Cu), Silver (Ag), Platinum (Pt), and Vanadium (V)</li></ul>	<ul style="list-style-type: none"><li>•Dull (NOT shiny)</li><li>•Brittle/Fragile/Breakable</li><li>•Not a conductor of electricity</li><li>•NO REACTION w/ ACID</li><li>•Can be solid, liquid, or gas at room temp.</li><li>•Examples: Sulfur (S), Neon (Ne), Fluorine (F), Iodine (I)</li></ul>

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Metalloids

- Metalloids\*\* have physical and chemical properties of both metals and nonmetals
- For example: shiny gray solid, reacts with HCl (acid), but DOES NOT conduct electricity

Examples: Boron (B), Silicon (Si)

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Transition Metals

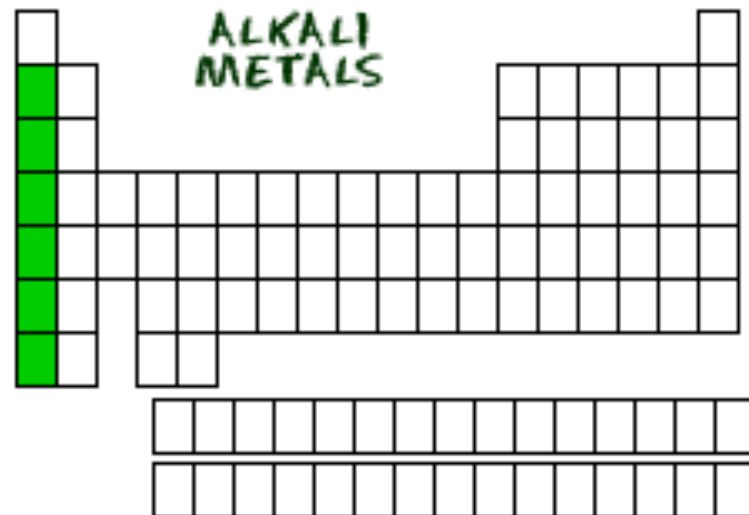
- Transition metals\*\* are in groups 3 through 12
- Emit energy with frequencies of visible colors

1 H																	2 He																																
3 Li	4 Be															5 B	6 C	7 N	8 O	9 F	10 Ne																												
11 Na	12 Mg															13 Al	14 Si	15 P	16 S	17 Cl	18 Ar																												
19 K	20 Ca															21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr																		
37 Rb	38 Sr															39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe																		
55 Cs	56 Ba															57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn																		
87 Fr	88 Ra	Ac															101 La	102 Ce	103 Pr	104 Nd	105 Pm	106 Sm	107 Eu	108 Gd	109 Tb	110 Dy	111 Ho	112 Er	113 Tm	114 Yb	115 Lu	(117)	(118)																
(119)	(120)	(121)	(122)	(123)	(124)	(125)	(126)	(127)	(128)	(129)	(130)	(131)	(132)	(133)	(134)	(135)	(136)	(137)	(138)	(139)	(140)	(141)	(142)	(143)	(144)	(145)	(146)	(147)	(148)	(149)	(150)	(151)	(152)	(153)	(154)	(155)	(156)	(157)	(158)	(159)	(160)	(161)	(162)	(163)	(164)	(165)	(166)	(167)	(168)
LANTHANIDES		58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu																																		
ACTINIDES		90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr																																		



Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Alkali Metals



ALKALI METALS

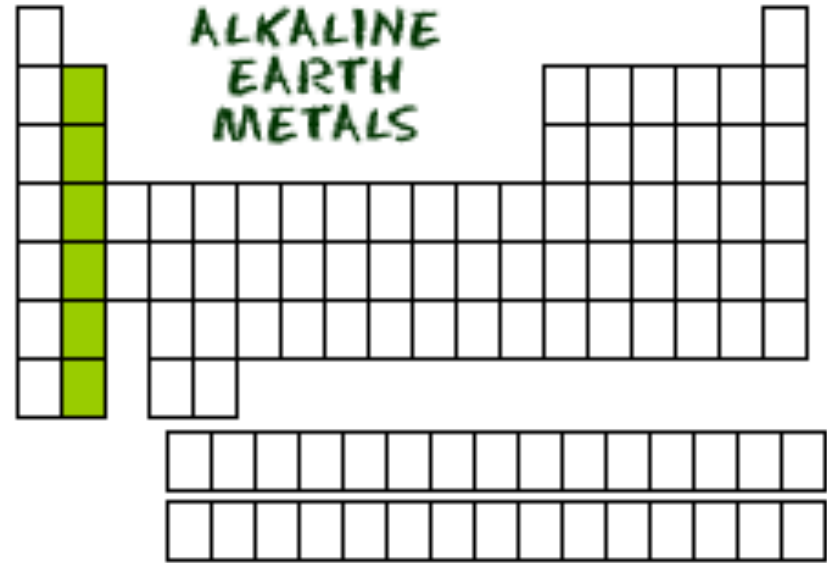
- Group #1 (except hydrogen) = alkali metals\*\*.
- Extremely reactive.
- Examples:
  - Sodium (Na) in salt
  - Lithium (Li) used in batteries

H	
Li	Lithium
Na	Sodium
K	Potassium
Rb	Rubidium
Cs	Cesium
Fr	Francium

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Alkaline Earth Metals

- Group #2 = alkaline earth metals.



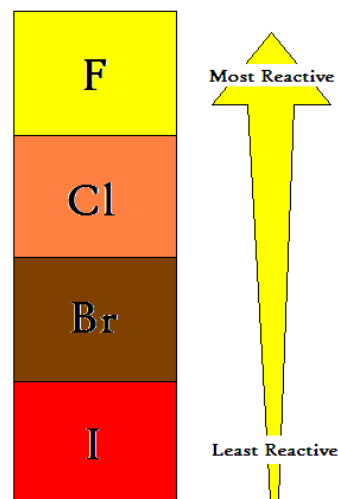
- Also highly reactive
- Examples:
  - Calcium (Ca) in milk and muscles
  - Magnesium (Mg) used in computers



Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

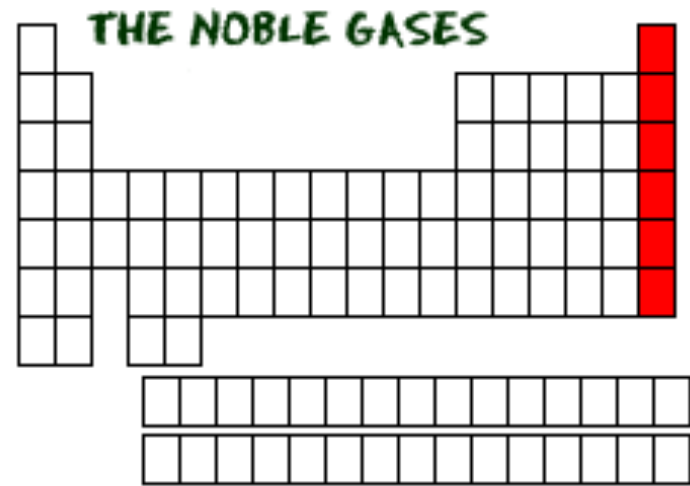
# Halogens

- Group #17 = halogens
- Highly Reactive
- Examples:
  - Fluorine (F) used in toothpaste
  - Bromine (Br) used in hot tubs



Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Noble Gases



- Group #18 = noble gases
- These gases are extremely unreactive.
- Examples:
  - Used in lasers and light bulbs



NEON IS USED  
IN MANY STREET SIGNS.

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Movie Time!

- <http://education-portal.com/academy/lesson/the-periodic-table-properties-of-groups-and-periods.html#lesson>

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Hands up!

- Most of the elements in the Periodic Table are classified as
  - Metalloids (3) Nonmetals
  - Noble gases (4) Metals
- Phosphorus is best classified as a
  - Nonmetal (3) Metalloid
  - Metal (4) Transition element

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# Classwork

- Complete 4.5 classwork with your neighbors!

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.

# HOMEWORK

Complete 4.5 HW

Objective: SWBAT to classify an element as a metal, non-metal, or metalloid based on its properties and location on the periodic table.