

Finish by _____

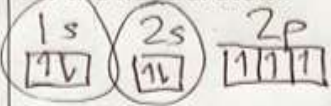
Warmup. Don't turn in. Keep this to study for Friday's big test.
 Friday's test covers notes and practice work from May 12th to May 23rd. See the class website <http://genest.weebly.com>

1. Which e- are considered the valence e- in any atom?

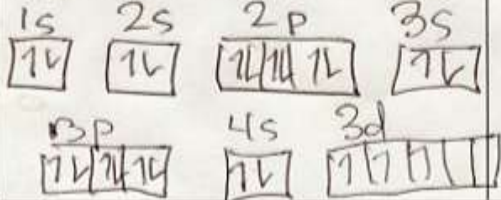
Answer: Valence electrons are the electrons of an atom's outermost shell.

For example, nitrogen, with $1s^2 2s^2 2p^3$ has five valence e-

2. For nitrogen:

<p>How many electrons are there in the neutral atom? <u>7</u></p> <p>Draw the boxes and arrows diagram for the neutral atom:</p> 	<p>Write the shorthand electron configuration:</p> <p>$1s^2 2s^2 2p^3$</p>	<p>This atom has <u>5</u> e- in its valence shell.</p> <p>Write the electron dot symbol for this element.</p>
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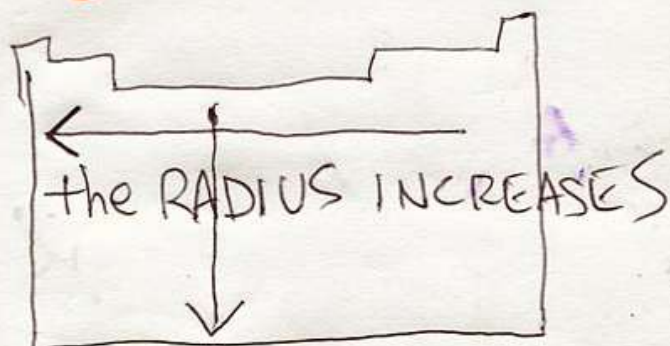
3. For Vanadium (atomic # 23):

<p>How many electrons are there in the neutral atom? <u>23</u></p> <p>Draw the boxes and arrows diagram for the neutral atom:</p> 	<p>Write the shorthand electron configuration:</p> <p>$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^3$</p>	<p>This atom has <u>2</u> e- in its valence shell.</p> <p>Write the electron dot symbol for this element.</p>
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don't turn this in study this

PURPOSE: WHAT PATTERNS ARE
HIDING IN THE PERIODIC TABLE

#1 size of atoms

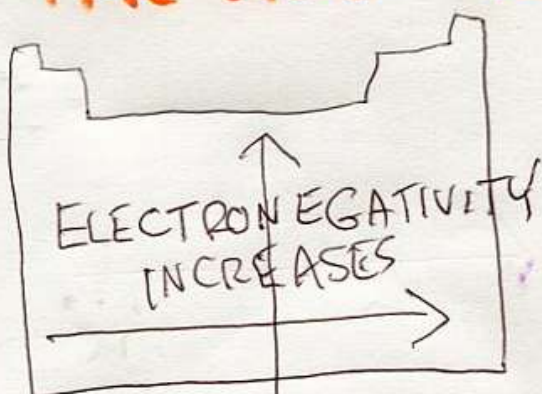


GOING DOWN, RADIUS INCREASES
BECAUSE THERE ARE MORE SHELLS

GOING TO THE LEFT, RADIUS
INCREASES BECAUSE THERE
ARE FEWER PROTONS

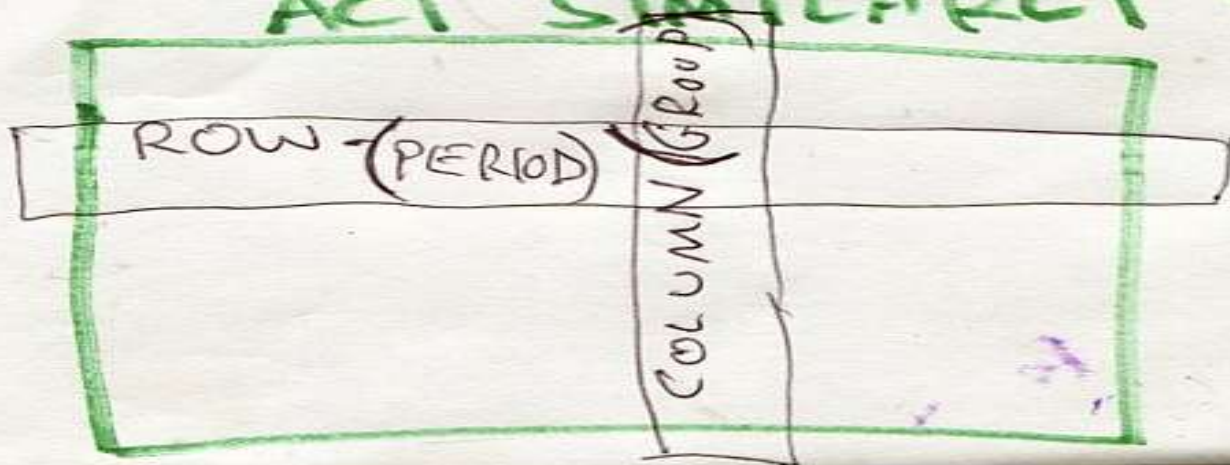
TO PULL THE e^-
TO THE NUCLEUS

#2 How "SELFISH" THE ATOM IS



ELECTRONEGATIVITY IS HOW STRONGLY YOU HOLD ON TO e^- THAT YOU SHARED WITH ANOTHER ATOM

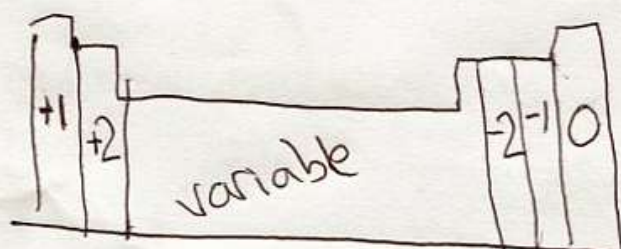
#3 WHICH ATOMS ACT SIMILARLY?



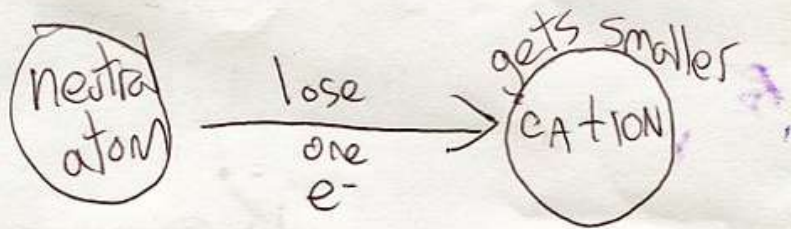
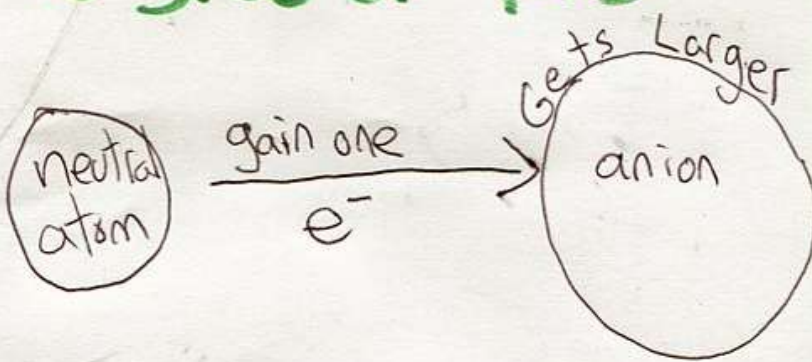
Elements in the same column have very similar properties

#4 OXIDATION NUMBER

is another name for charge



#5 SIZE OF IONS



h o m e w o r k

a n s w e r s

How to draw boxes and arrows for larger atoms

CleMIs+ry: <http://genest.weebly.com>

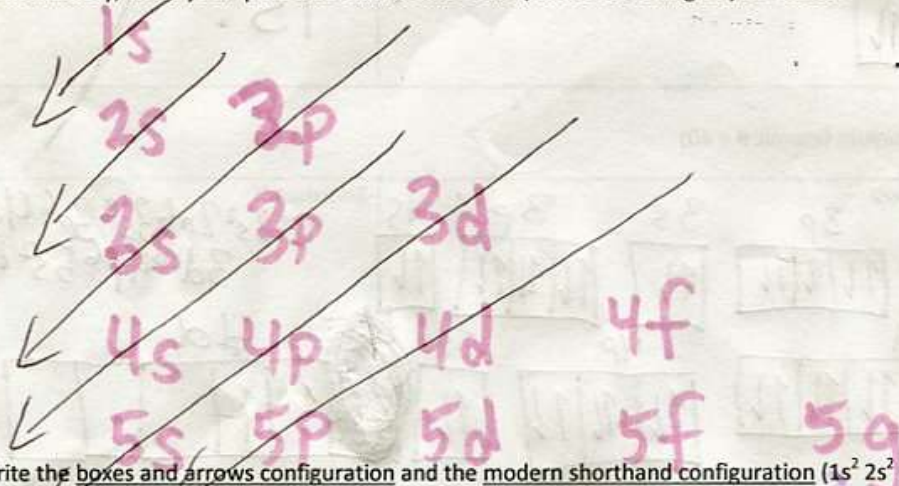
Stop in for help every day at lunch and Tues, Weds., & Thurs after school!

After-hours question? Email me at home: egenest@madison.k12.wi.us



ANSWERS
Name _____
Period _____

1. From memory, write your 'pine tree' mnemonic device, without looking at your notes:



2. Write the boxes and arrows configuration and the modern shorthand configuration ($1s^2 2s^2 2p^6$ etc) for each:
a. strontium (atomic # 38)

<p>Boxes and arrows:</p>	<p>Shorthand:</p> $1s^2 2s^2 2p^6 3s^2$ $3p^6 4s^2 3d^{10} 4p^6 5s^2$
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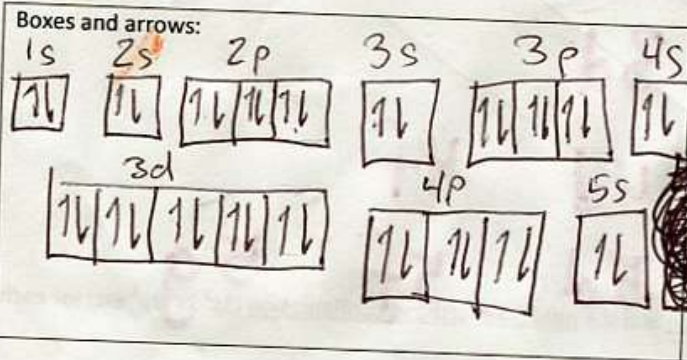
- b. zinc (atomic # 30)

<p>Boxes and arrows:</p>	<p>Shorthand:</p> $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10}$
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c. helium (atomic # = 2)

Boxes and arrows: 	Shorthand: $1s^2$
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d. zirconium (atomic # = 40)

Boxes and arrows: 		Shorthand: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^2$
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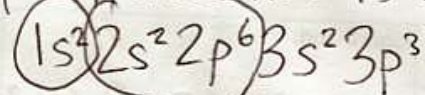
3. Place the following events in chronological order (1 = first, 4 = last) to describe how an electron absorbs and emits energy:

- ❖ electron absorbs energy at ground state.
- ❖ electron jumps to excited state.
- ❖ atom is energized with electricity.
- ❖ electron falls to ground state.

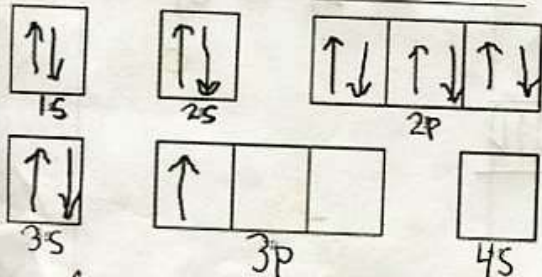
$\frac{2}{3}$
 $\frac{1}{4^*}$

** Put a star by the step where light is emitted.

4. Write the electron shorthand configuration (like $1s^2 2s^2$, etc) for an atom of neutral phosphorous
 phosphorus has 15 electrons according to the periodic table



5. What element is this? ALUMINUM



(just look up 13 electrons on the periodic table)

TWO EIGHT EIGHTEEN FOUR
 For $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^2$ Germanium

- a. how many electrons are in each shell
- b. what element is this?
7. How many e- are in the valence shell of $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^1 5s^1 4d^1 5p^1$
8. For $1s^2 2s^2 2p^6 3s^1$
 - c. how many electrons are in each shell
 - d. what element is this? SODIUM

first shell: two e-
 second shell: eight e-
 third shell: one e-