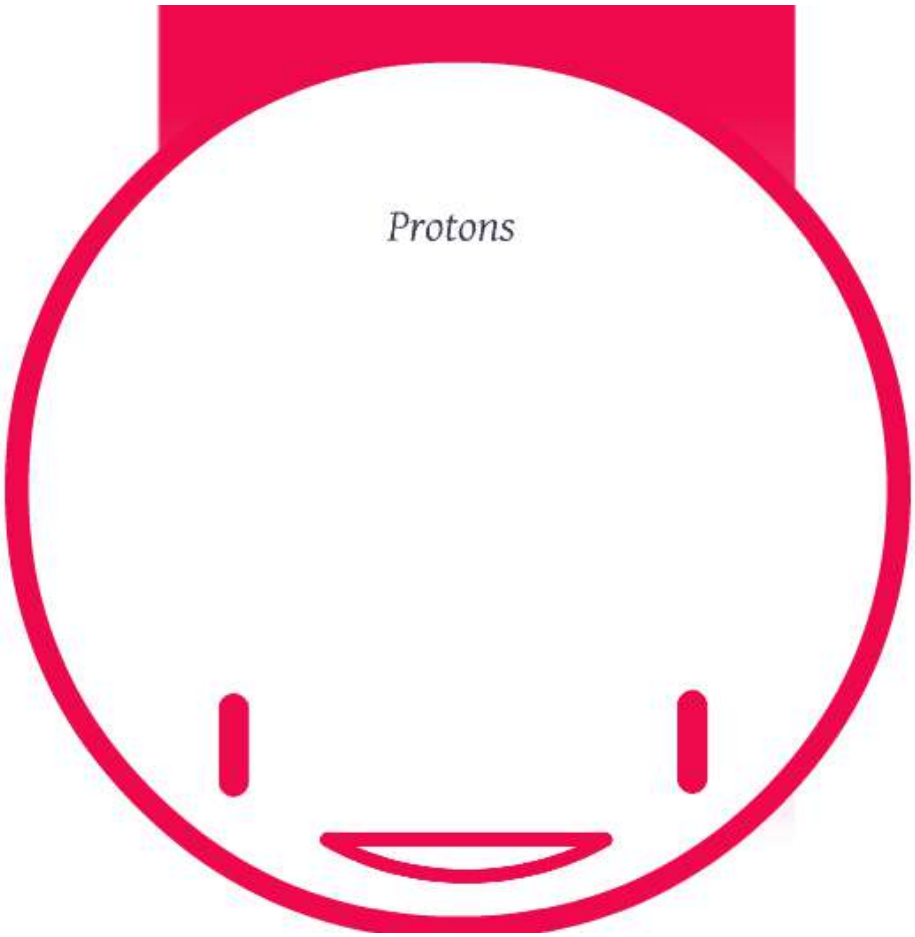
Environmental Chemistry

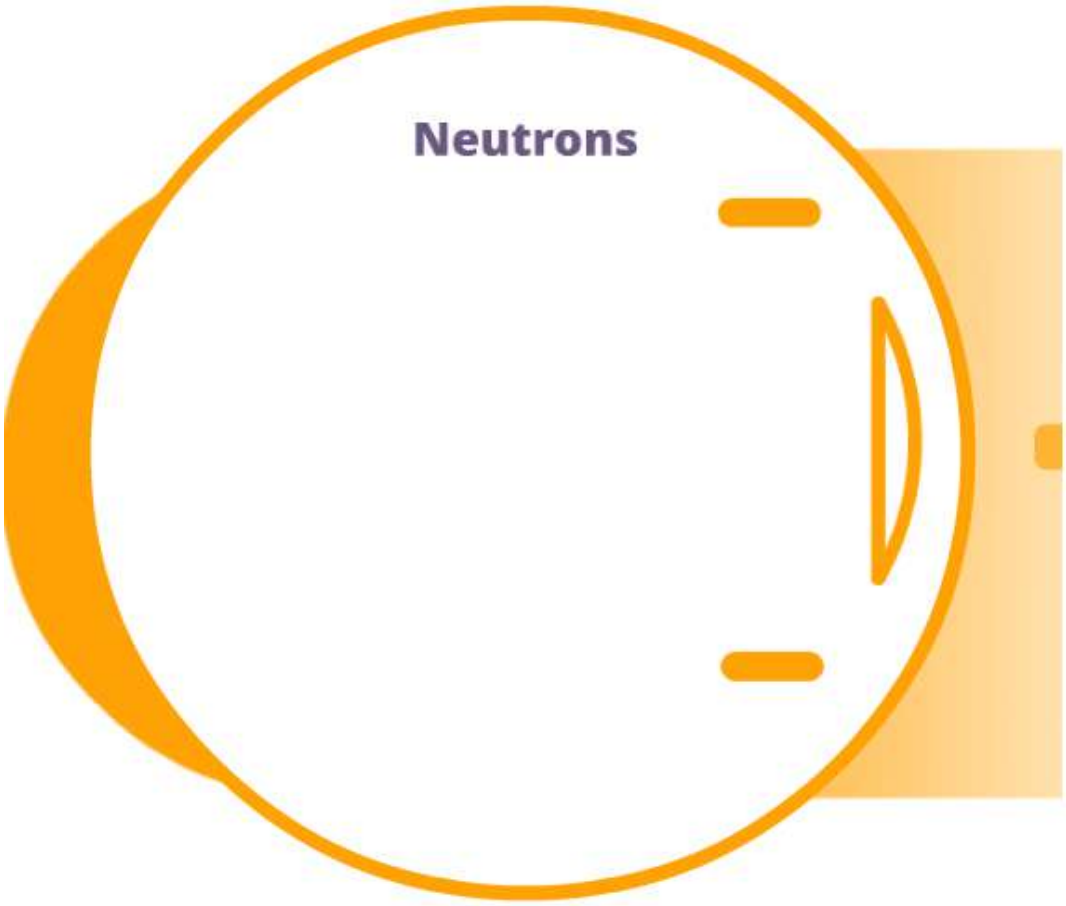
LT 1 I can explain the structure of matter in terms of its subatomic particles and affinity for attracting other atoms.

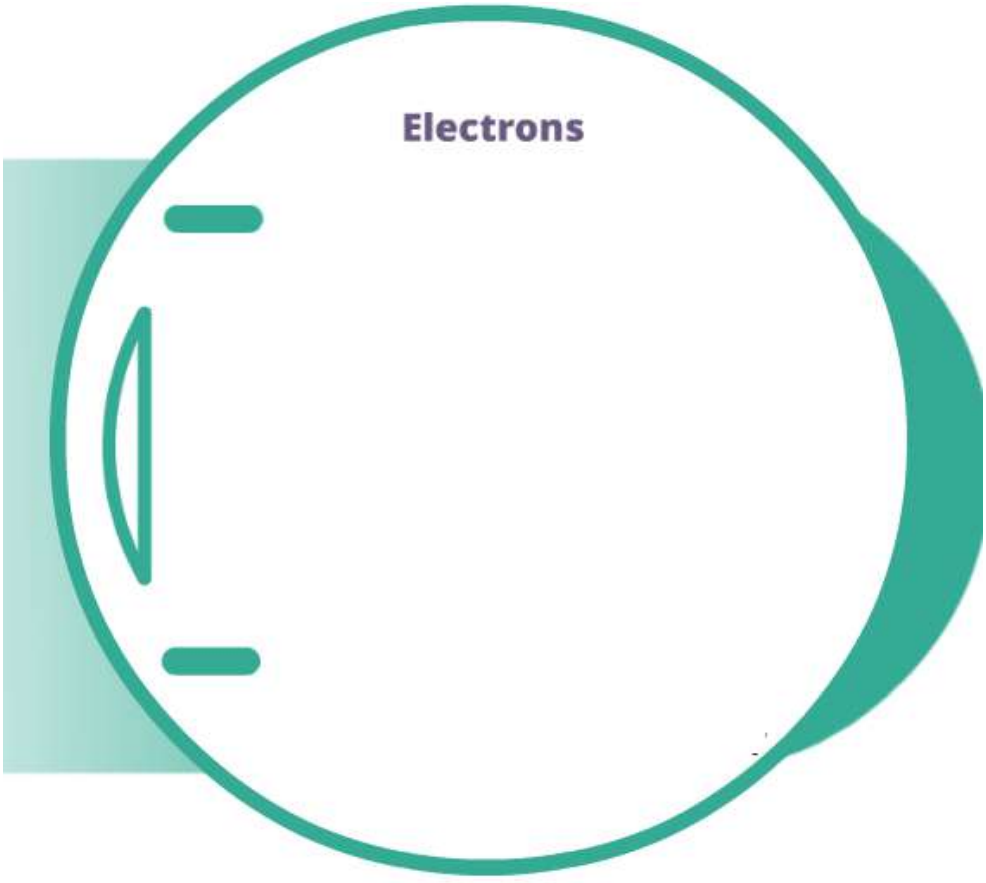
Date: February 4, 2013

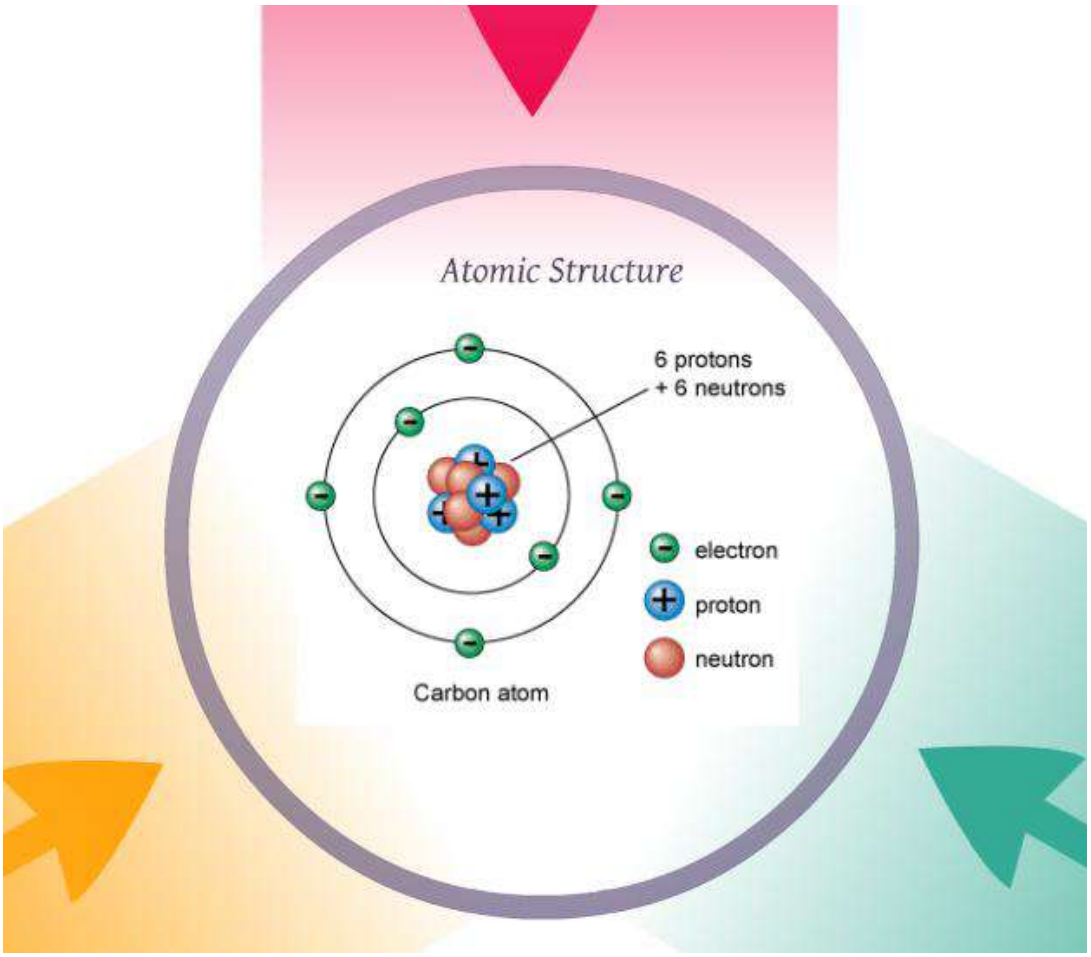
Guiding Questions:

1. *What are the three subatomic particles of an atom?*
2. *What are the properties of the three subatomic particles of an atom?*
3. *What is the difference between an electron and valence electrons?*
4. *What is the electronegativity of an atom?*
5. *How can we draw or represent different atoms?*




Neutrons


Electrons



How many protons does the carbon atom have?

How many neutrons does the carbon atom have?

How many electrons does the carbon atom have?

How many electrons are in the first shell?

How many electrons are in the second shell?

How many valence electrons are there?

What is the atomic number for carbon?

What is the atomic mass of carbon?

Valence Electrons

Reactive Atom Inert/Stable Atom

Electronegativity:

Atomic Attraction (IPAD APP: Elements)

Compare the electronegativity between:

Oxygen and Iron

Oxygen and Hydrogen

Carbon and Hydrogen

Sodium and Cloride

Helium and Nitrogen

On an IPAD open the following APP: NOVA ELEMENTS

1. ***Touch*** EXPLORE: The Interactive Periodic Table

2. ***Touch*** HELIUM ATOM

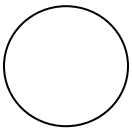
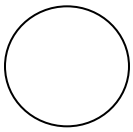
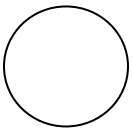
3. ***Touch*** the Green Hammer that says BUILD

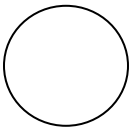
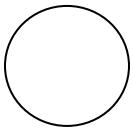
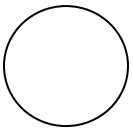
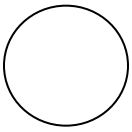
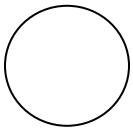
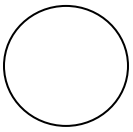
4. Using the atomic number and weight. **Build** a hydrogen atom by adding the appropriate amount of protons, neutrons and electrons.

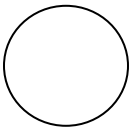
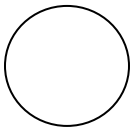
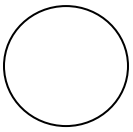
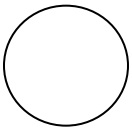
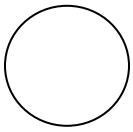
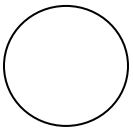
5. Once you believe you have the correct number of protons, neutrons, and electrons. **Complete** the atomic structure card for the Helium ATOM. When you have completed writing down the information ***Touch*** *the* ***SUBMIT*** button.

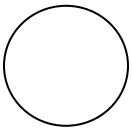
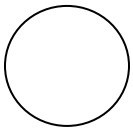
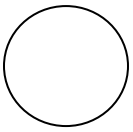
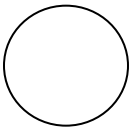
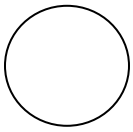
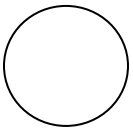
6. Repeat steps 1-5 for the following elements:

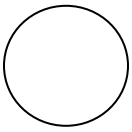
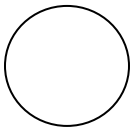
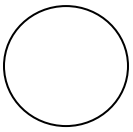
Be, B, C, N, O, F, Ne, Na, Mg, Al, Si, P, S, Cl, Ar, K, Ca, Fe, Ni, Cu, Zn, I

He Atomic # Atomic Mass	Be Atomic # Atomic Mass	B Atomic # Atomic Mass
		

C Atomic # Atomic Mass	N Atomic # Atomic Mass	O Atomic # Atomic Mass
		
F	Ne	Na
Atomic #	Atomic #	Atomic #
Atomic Mass	Atomic Mass	Atomic Mass
		

Mg Atomic # Atomic Mass	Al Atomic # Atomic Mass	Si Atomic # Atomic Mass
		
P	S	Cl
Atomic #	Atomic #	Atomic #
Atomic Mass	Atomic Mass	Atomic Mass
		

Cl Atomic # Atomic Mass	Ar Atomic # Atomic Mass	K Atomic # Atomic Mass
		
Ca	Fe	Ni
Atomic #	Atomic #	Atomic #
Atomic Mass	Atomic Mass	Atomic Mass
		

Cu Atomic # Atomic Mass	Zn Atomic # Atomic Mass	I Atomic # Atomic Mass
		

1. *What are the three subatomic particles of an atom?*

2. *What are the properties of the three subatomic particles of an atom?*

3. *What is the difference between an electron and valence electrons?*

4. *What is the electronegativity of an atom?*

5. *How can we draw or represent different atoms?*

Environmental Chemistry

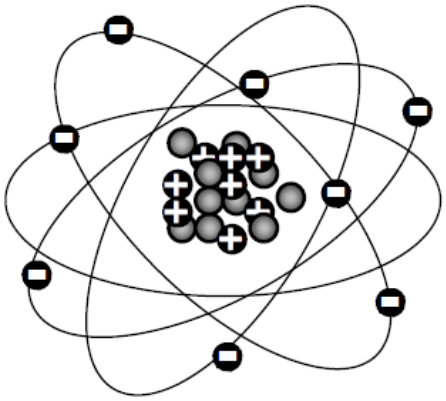
LT 1 I can explain the structure of matter in terms of its subatomic particles and affinity for attracting other atoms.

Date: February 5, 2013

Warm Up

Subatomic Particle	Mass		Charge			Where Found	
	Yes	No	Positive	Negative	Neutral	Inside Nucleus	Outside Nucleus
Proton							
Electron							
Neutron							

Atom A



Atom B

1. How many protons are in atom A? _____ atom B? _____
2. How many neutrons are in atom A? _____ atom B? _____
3. How many electrons are in atom A? _____ atom B? _____
4. What is the atomic mass of atom A? _____ atom B? _____
5. What is the atomic number of atom A? _____ atom B? _____

Guiding Questions:

1. How do you calculate the number of protons in an element?
2. How do you calculate the number of electrons in an element?
3. How do you calculate the number of neutrons in an element?
4. What does the atomic number tell us about the atom?
5. What does the atomic mass tell us about the atom?
6. What is the importance of electronegativity?

Atomic Number:

Atomic Mass:

Protons =

Electrons =

Neutrons =

Element Symbol	Atomic Number	Atomic Mass	Number of Protons	Number or Neutrons	Number of Electrons
H					
Li					
Na					
K					
Mg					
Ca					
Al					
C					
N					
P					
O					
S					
F					
Cl					
Br					
I					
He					
Ne					
Fe					
Ni					
Cu					
Zn					
Au					
Ag					
Pb					
Hg					
Po					
W					

Electronegative Difference > 2	Strong Attraction
Electronegative Difference < 2; > 0.5	Medium Attraction
Electronegative Difference < 0.5	Weak Attraction

Atom 1 v. Atom 2	Electronegativity of Atom 1	Electronegativity of Atom 2	Electronegative Difference	"Attractive Atom"	Strong, Medium or Weak Attraction
Sodium v. Chlorine					
Potassium v. Chlorine					
Copper v. Zinc					
Aluminum v. Iron					
Calcium v. Magnesium					
Oxygen v. Nitrogen					
Carbon v. Hydrogen					
Carbon v. Oxygen					
Iron v. Oxygen					
Sulfur v. Oxygen					
Copper v. Chlorine					
Oxygen v. Hydrogen					

Guiding Questions:

1. How do you calculate the number of protons in an element?

2. How do you calculate the number of electrons in an element?

3. How do you calculate the number of neutrons in an element?

4. What does the atomic number tell us about the atom?

5. What does the atomic mass tell us about the atom?

6. What is the importance of electronegativity?

Environmental Chemistry

LT 1 I can explain the structure of matter in terms of its subatomic particles and affinity for attracting other atoms.

Date: February 7, 2013

Warm Up:

Element Name	Chemical Notation	Number of Protons	Number of Electrons	Number of Neutrons
aluminum				
beryllium				
		5		
			18	
carbon				
			17	18
		19		
	$^{4}_{2}He$		2	

For the following pairs of atoms, circle the one with the most electronegativity.

1. **H & Cl**
2. **Li & H**
3. **Mg & K**
4. **Cs& Cl**
5. **Na & O**
6. **Al & Fe**

For each of the above pairs of atoms, determine if they would form a weak, medium or strong attraction:

1. 2.

3. 4.

5. 6.

Guiding Questions:

1. What are the periodic trends for electronegativity in the periodic table?
2. How can you draw an atom to show just the valence electrons?
3. When and why do atom form bonds?

Lewis Structures:

On an IPAD open the following APP: LEWIS DOTS

1. ***Touch*** the carbon button.

    a. How many dots are around carbon?

    b. What do you think these dots represent?

Draw the Carbon atom, this is called it's LEWIS DOT STRUCTURE:

2. ***Touch*** the hydrogen button. Drag the hydrogen atom away from the carbon atom. Repeat three more times--when you are done you should have 1 carbon and 4 hydrogen atoms on the screen.

Draw one Hydrogen atom, this is called it's LEWIS DOT STRUCTURE:

3. Using a periodic table, what is the electronegativity of carbon? _____

    What about hydrogen? _____

    Who will be attracted to who?

    _____will be attracted to _____

4. **Arrange** the atoms so the appropriate amount of bonds can form and using your **finger** connect valence electrons from one atom to the next to form the bond.

Draw your completed molecule between 1 carbon and 4 hydrogen below:

5. **Clear** the screen.

6. **Add** 2 hydrogen and 1 oxygen.

Draw the Lewis Dot Structure for Hydrogen:

Draw the Lewis Dot Structure for Oxygen:

7. Using a periodic table, what is the electronegativity of oxygen? _____

   What about hydrogen? _____

   Who will be attracted to who?

   _____will be attracted to _____

8. **Arrange** the atoms so the appropriate amount of bonds can form and using your **finger** connect valence electrons from one atom to the next to form the bond.

Draw your completed molecule between 1 oxygen and 2 hydrogen below:

5. **Clear** the screen.

6. **Add** 1 sodium and 1 chlorine.

Draw the Lewis Dot Structure for sodium:

Draw the Lewis Dot Structure for chlorine:

7. Using a periodic table, what is the electronegativity of sodium? _____

What about chlorine? _____

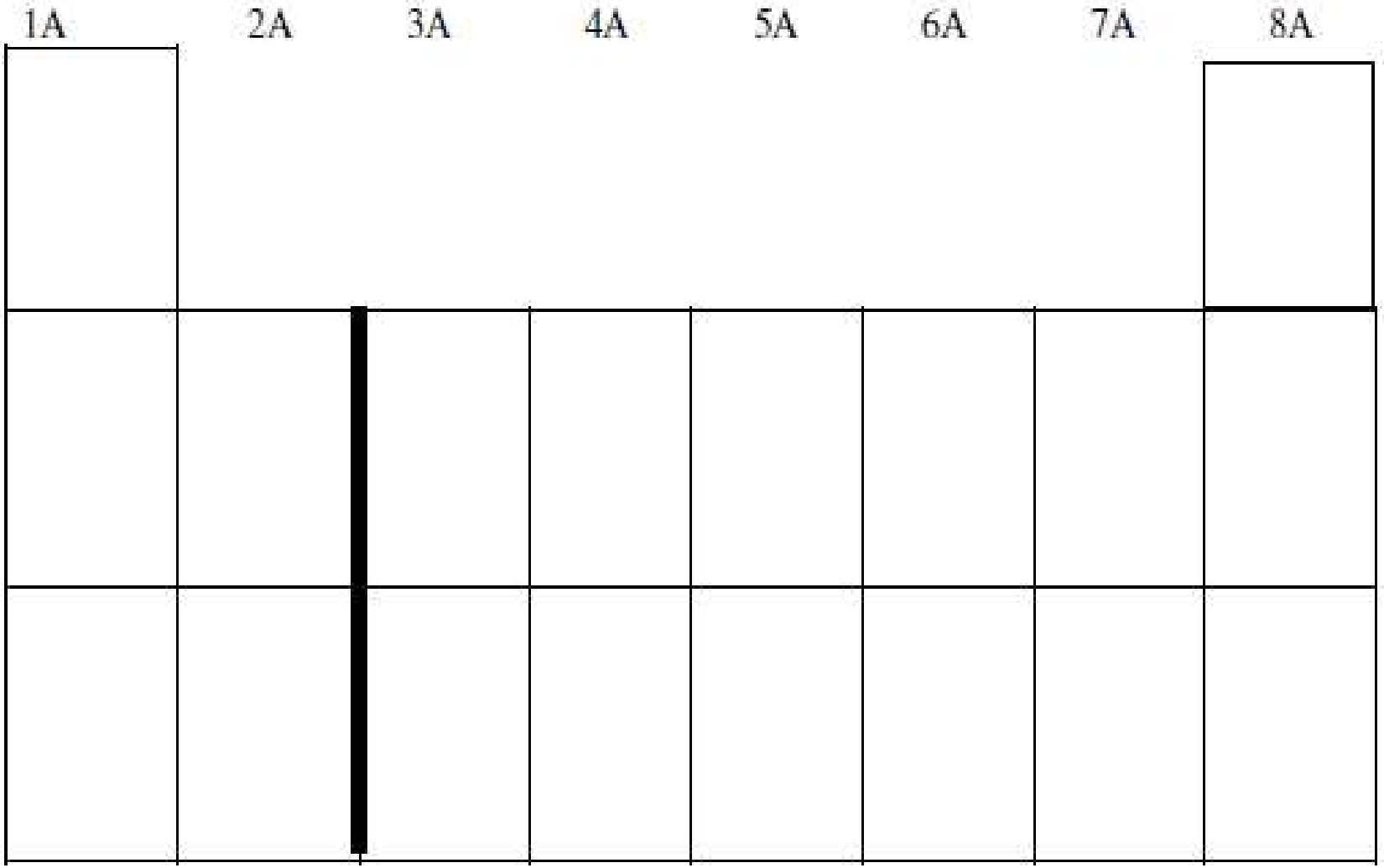
Who will be attracted to who?

_____will be attracted to _____

8. **Arrange** the atoms so the appropriate amount of bonds can form and using your **finger** connect valence electrons from one atom to the next to form the bond.

Draw your completed molecule between 1 sodium and 1 chlorine below:

Fill in the following section of the periodic table with the symbols of the first 18 elements. Then, add the electron dots to complete the Lewis dot structures.



Guiding Questions:

1. What are the periodic trends for electronegativity in the periodic table?

2. How can you draw an atom to show just the valence electrons?

3. When and why do atom form bonds?

Environmental Chemistry

LT 1 I can explain the structure of matter in terms of its subatomic particles and affinity for attracting other atoms.

Date: February 8, 2013

Assignment: Synthesis Understanding of Atomic Structure, Electronegativity and atomic diagrams.

Task:

1. Use the following template to create a poster about one of the following atomic elements:

2. Resources that would be helpful:

IPAD APPs

NOVA Elements
Lewis Dots
Elements

Periodic Tables

Notes, Practice Assignments

3. Poster must show good craftsmanship: clear handwriting, organization, use of color and diagrams.

Eligible Atoms

Krypton	Potassium	Gallium	Phosphorus
Sulfur	Fluorine	Cobalt	Sodium
Iron	Copper	Zinc	Aluminum
Arsenic	Iodine		

ELEMENT NAME

Atomic Number Atomic Mass Bohr Model Diagram		Type of Element (noble, alkali, alkaline, metalloid, halogen, metal, transition metal) Description of Element, what does it look like, what is its practical purpose or significance?						
Lewis Dot Diagram		Strong Electronegative Attraction		Medium Electronegative Attraction		Weak Electronegative Attraction		
Protons	#	Electronegativity of Atom 1		Electronegativity of Atom 1		Electronegativity of Atom 1		
Neutrons	#	Electronegativity of Atom 2		Electronegativity of Atom 2		Electronegativity of Atom 2		
Electrons	#	Electronegative Difference		Electronegative Difference		Electronegative Difference		
Drawing or Picture of Element		Lewis Dot Diagram of Strong Electronegative Bonding		Lewis Dot Diagram of Medium Electronegative Bonding		Lewis Dot Diagram of Weak Electronegative Bonding		