

Ions and Oxidation Numbers Workshop

1. What is an Ion?
2. What are the two types of ions and how are they different?
3. Why are ions formed?
4. What is the octet rule?
5. How do atoms satisfy the octet rule?
6. Where on the periodic table are cations found? Anions found? Draw the pattern for oxidation numbers.

Periodic Table of the Elements

	1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1																			
2																			
3																			
4																			
5																			
6																			
7																			

7. What does an oxidation number show about an ion?
8. Are all oxidation numbers set in stone? If not, what group may change?

Isotopes and Average Atomic mass workshop

1. What is a neutron? Its charge?
2. What is an Isotope?

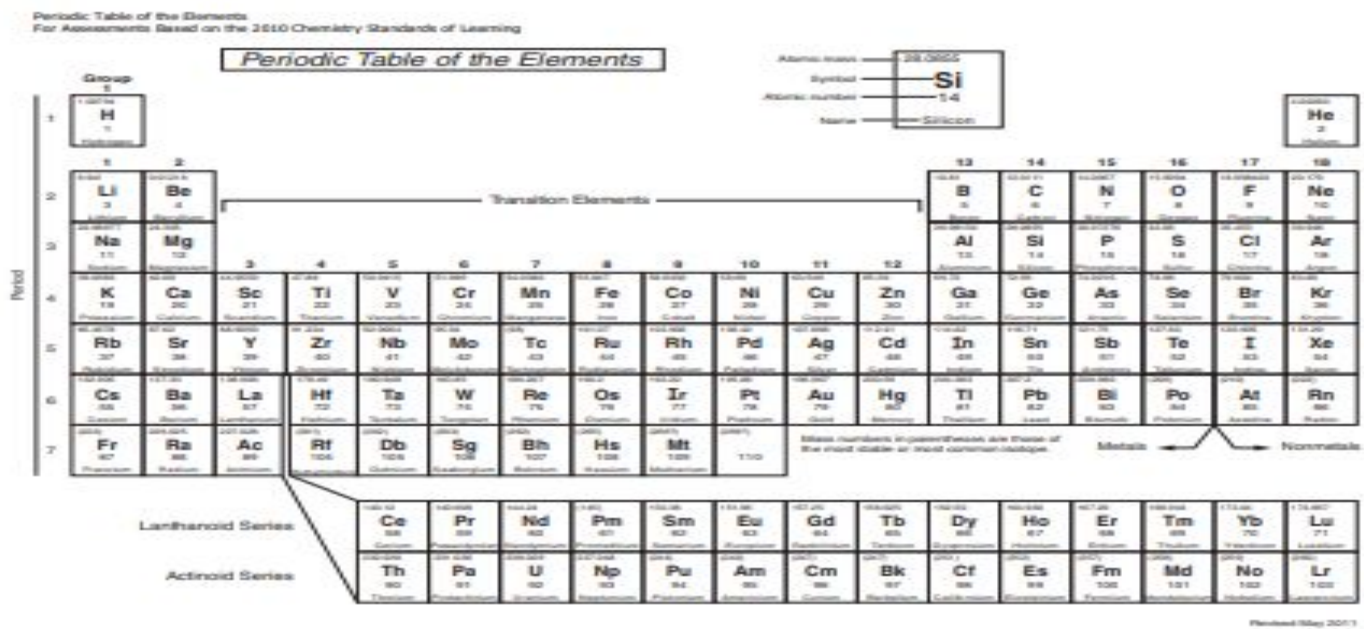
Use the following chart to answer questions 3 - 5

	protons	neutrons	electrons
Substance A	8	8	8
Substance B	8	9	8

3. Are substance A and B the same element? If yes, how do you know?
4. What is the difference between substance A and B? Is there a term for this?
5. What element is substance A? How do you know?
6. Boron has an atomic mass of 10.81 amu according to the periodic table. However, no single atom of boron has a mass of 10.81 amu. How can you explain this difference?
7. Why is the mass on the periodic table a decimal?
8. How is the mass on the periodic table calculated? If there is a formula, write it.
9. What does percent abundance mean?
10. Calculate the RAM of magnesium from the following data set. Mg-24 has a percent abundance of 78.7%. Mg-26 has a percent abundance of 11.17%. Mg-25 has a percent abundance of 10.13%.

Metals/nonmetals/metalloids (semiconductors) Workshop

1. Color the metals blue. Color the nonmetals red. Color the metalloids yellow.



2. What are the properties of each group. Include conductivity, electrons and how elements achieve stability, and the general properties.

3. Who is Henry Moseley and how did his contributions to the arrangement of the periodic table differ from Dmitri Mendeleev?

Tour of the Periodic Table Workshop: Fill in the Chart below:

GROUP NAME	GROUP NUMBER	GENERAL CHARACTERISTICS (Reactivity, trends within the groups, etc)	OXIDATION NUMBERS	GENERAL ELECTRON CONFIGURATION
Alkali Metals	1			
Alkaline Earth Metals	2			
Transition Metals	3-12 plus Pb and Sn			
Halogens	17			
Noble Gases	18			

PERIOD NAME		GENERAL CHARACTERISTICS (Reactivity, trends within the groups, etc)	OXIDATION NUMBERS	GENERAL ELECTRON CONFIGURATION
Lanthanides	XXXXXXXX			
Actinides	XXXXXXXX			

Trends workshop #1 Atomic Radius

1. Describe in your own words what a trend is.
2. What is a radius?
3. Draw a picture to represent the radius of an atom.
4. What is an energy level? How do we know how many an element has?
5. Which energy level holds the electrons involved in reactions or bonds? What do we call these electrons?
6. How do energy levels affect the size of an atom?
7. What is a coulombic attraction?
8. Using your knowledge of an atom explain why they exhibit coulombic attractions.
9. What is the definition of effective nuclear charge (Z_{eff})?
10. Does the effective nuclear charge and atomic radius have a direct or inverse relationship?
11. Where are the smallest elements on the periodic table located? Why are these elements small?
12. Where are the largest elements on the periodic table located? Why are these elements large?

13. Choose which atom is larger. Sr or Sn? P or As? Al or Ca?

14. Draw a representation of this trend using arrows to show increasing atomic radius.

15. What is electron shielding?

16. How does electron shielding affect the radius?

Trends workshop # 2 Electronegativity

1. What is electronegativity?
2. What type of atoms attract electrons as a way to satisfy the octet rule?
3. What atom has the highest electronegativity?
4. What family has an electronegativity of zero? Why?
5. How does effective nuclear charge affect electronegativity?
6. Do large atoms, like Francium, have small or large electronegativity values? Why?
7. How does electron shielding effect electronegativity?
8. Draw a representation of the trend using arrows for the trend of electronegativity values as you move **across the periodic table**. Explain why this trend occurs.
9. Draw a representation of the trend using arrows for trend of electronegativity values as you move **down a group**. Explain why this trend occurs.
10. Choose the atom with the largest electronegativity value, Si or Ar? O or Br?

Trends workshops # 3 ionization Energy

1. What does ionization energy mean?
2. What type of elements lose electrons to satisfy the octet rule?
3. What type of elements do not lose electrons to become stable?
4. How does effective nuclear charge affect ionization energy?
5. How does electron shielding effect ionization energy?
6. What elements on the periodic table have the highest ionization energy? Why is this?
7. What elements on the periodic table have the lowest ionization energy? Why is this?
8. Choose the element with the highest ionization energy. Sn or Ag? O or Te?
9. Draw a representation of this trend using arrows to show increasing ionization energy across a period and down a group.
10. Ionization energy removes one electron at a time. If you were to remove a second electron will this require more or less ionization energy? Why?

Presentation skills workshop

See the posted videos on the Chem Squad Website