LESSON 12

CLASSWORK

Atoms By Numbers

Atomic Number and Atomic Mass

Name _____

Date _____ Period _____

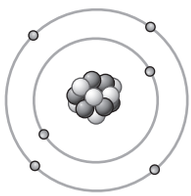
Purpose

To explore the basic atomic structure of different elements.

Part 1: Parts of an Atom

1. Here is a simple atomic model of a beryllium atom. Label the electrons, nucleus, neutrons, and protons in the model.
2. The total charge on each atom is zero. Explain why.

3. Why do you think the mass of the carbon atom shown is 12 atomic mass units (amu)?



Carbon, C

Part 2: The Numbers

4. Use a periodic table to help you fill in the table.

Element	Chemical symbol	Atomic number	Number of protons	Number of electrons	Number of neutrons	Mass of an atom (amu)	Average atomic mass (amu)
beryllium					5	9	9.012
fluorine					10		
				6		12	
chlorine					18		35.45
lead					126		
			29		36		
gold					118		

5. How did you figure out the number of electrons in each atom?

6. How did you figure out the number of protons in each atom?

7. How did you figure out the number of neutrons in each atom?

8. How did you figure out the mass of each atom?

9. How does the mass of each atom compare to the average atomic mass of the element given in the periodic table?

10. Make a drawing of a nitrogen atom, similar to the one given for beryllium in Question 1.

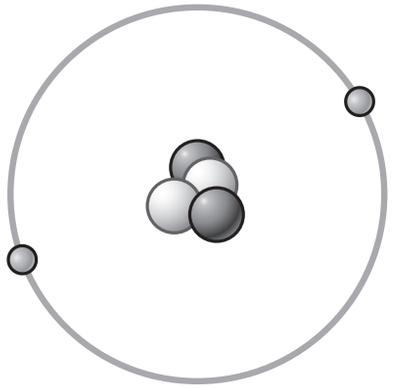
11. If you know the atomic number of an element, what information does it give you about neutral atoms of that element?

12. Making Sense Explain how you can estimate the number of neutrons in the atoms of an element.

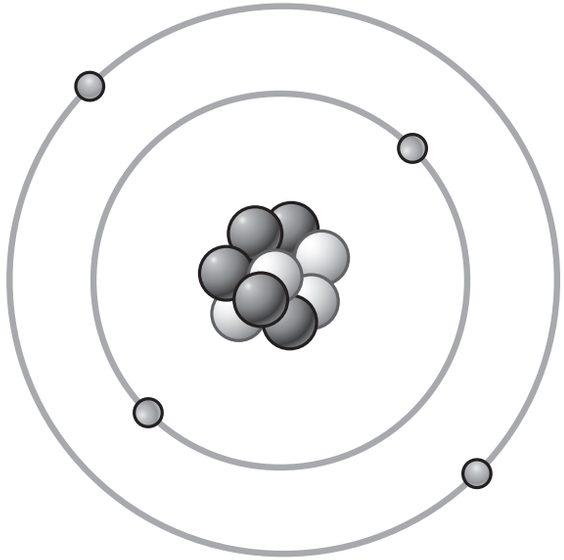
13. If You Finish Early Examine tellurium, Te, and iodine, I, in the periodic table. Compare their atomic numbers and average atomic masses. Why does iodine have a lower average atomic mass than tellurium? Can you find other examples of this in the periodic table?

ChemCatalyst

Models of a helium atom and a beryllium atom are shown. The nucleus of each contains protons and neutrons. The electrons orbit the nucleus.



Helium, He



Beryllium, Be

1. Compare the two models. List three similarities and three differences.
2. Based on the models, why do you think helium is number 2 (the second element) and beryllium number 4 (the fourth element) on the periodic table?