-Name: _____ Date: _____Period: _____
NOTES

Chemistry Notes: Chapter 1.1

What is matter?	Matter is anything that has _____ and _____. It can be a _____, _____, or _____.
What is an element?	A substance that is made of _____ of the _____ type. Each element is made of a _____ type of atom. There are over _____ known naturally occurring elements.
What is an atom?	The smallest particle that makes up any type of _____. All _____ is made of atoms. Atoms are very very _____.
What makes up an atom?	An atom is made up of 3 _____ particles: 1. Protons—have a _____ (+) charge 2. Neutrons—have _____ (o) charge (think: neutral) 3. Electrons—have a _____ (-) charge
How do charged particles interact?	Particles with the same type of charge _____ each other—they push away from each other. Particles with different/opposite charges _____ each other—they are drawn toward one another. (This is where the saying "opposites attract" came from.)
What is the structure of an atom?	● The _____ and _____are grouped together in the _____ of the atom. ● The center of the atom is called the _____. ● Electrons move around _____ the nucleus in what we call an _____ _____. ● The nucleus has an overall _____ charge (because it contains _____). ● The electron cloud has a _____ charge (because it contains _____).
What is the relationship between a proton and a neutron?	A neutron has about the _____ _____ as a proton. They are grouped together in the _____.
How big is an atom?	Atoms are extremely _____. The electron cloud is about _____ times the size of the _____.
What is special about electrons?	● Electrons are much smaller than _____ (2000 times smaller). ● Electrons move around the _____ very quickly. Scientists have found that it is not possible to determine the _____ _____ of any single electron in an atom because they _____. This is why we picture electrons as a _____ around the _____.
How do atoms stay together?	Atoms do not have a _____ or anything else separating them from the rest of the world. The negatively charged _____ are attracted to the positively charged _____. However, electrical _____ that are alike (such as two _____ charges) _____ each other. This is why electrons remain _____ _____ in the electron cloud.
What are neutral atoms?	Atoms that have no overall electrical _____ because they have an equal number of _____ and _____.
What is an atomic number?	The atomic number is the number of _____ in the nucleus of an atom. This determines the _____ of the atom. **Example:** Oxygen has an atomic number of _____, while Carbon has an atomic number of _____. This means that Oxygen has _____ protons, and Carbon has _____ protons.
What is an atomic mass number?	Atomic mass number is the total number of _____ and _____ in the nucleus. Atoms of the same element will always have the same number of _____, but may have different numbers of _____.
What is an isotope? (D12)	Isotopes are _____ of the same element that have a _____ number of _____. Some elements have _____ isotopes, while other only have a _____.

How do we show that something is an isotope? (D13)	An isotope is described by the name of the _____ and the total number of its _____ and _____ (atomic mass number). **Ex: Chlorine-35 (name-atomic mass number)**
What is an ion? (D14)	An ion is an **atom** that has an _____ _____. The charge can be _____ or _____. Ions have _____ numbers of _____.
How is an ion formed? (D14)	An ion is formed when an atom _____ or _____ one or more _____.
How do we show that something is an ion?	An ion is described by its _____ (or symbol) and _____. Ex: _____ or O^{2-}
How do I find the number of protons in an atom?	_____ = _____ (the number above the element's symbol on the periodic table)
How do I find the number of neutrons in an atom?	_____ minus (-) the number of _____
How do I find the number of electrons in an atom?	• In a neutral atom, the # of _____ is the _____ as the number of _____. • In an _____ (with a positive or negative charge), the number of electrons is _____ from the number of protons. To find the number of electrons, _____ the _____ from the number of _____ the atom has o # protons – _____ = # electrons

Questions:

1. What particles are found in the nucleus of an atom? _____
2. What particles move around outside the nucleus? _____
3. If all atoms are composed of the same particles, how can there be more than 100 different elements?
   _____
   _____
4. Why do electrons stay in an electron cloud around the nucleus? _____
   _____
5. What particles are counted to determine the atomic number? _____
6. Use your knowledge of atomic numbers to fill in the chart below. If an atom is an ion, I have written its charge in parenthesis after the element name. Ex: Oxygen (-2) has a charge of -2.

Element	**Atomic Number**	**Atomic Mass #**	**# Protons**	**# Neutrons**	**# Electrons**
Hydrogen (+1)			1	0	
Oxygen (-2)	8	16			
Carbon-12		12	6		
Carbon-14		14	6		
Gold	79	197			
Iron	26			30	
Nitrogen (+3)		14	7		

7. Which of the elements in the table above are ions? _____
8. Which of the elements in the table above are isotopes? _____
9. What particles are counted to determine the atomic mass number? _____
10. If oxygen has 8 protons and 8 neutrons, what is its atomic mass number? _____
11. Why do you think neutrons are necessary in the nucleus of an atom?

12. Draw a picture of an atom: