Name:_____
Period:_____
Date:_____

CHAPTER 3 REVIEW – Due Thursday 11/14!!!

Below are concepts you should know for your test. **This is *not* an exhaustive review—you must use your blue learning reflection packet as a knowledge checklist to make sure you understand everything!!!!**

Below is a list of what some suggested items to study:

- Atomic theory timeline
- 3.1 Chapter Review worksheet (yellow)
- 3.3 Chapter Review worksheet (white--this was your notes on isotopes, average atomic mass, etc.)
- Average atomic mass lab
- Molar conversion practice (and notes) sheet
- Molar Conversion Assignment
- Molar Conversion Quiz
- Any and all notes you may have taken in this chapter!

1. **Define each of the following:**

    a. **atomic number:**

    b. **mass number:**

    c. **relative atomic mass:**

    d. **average atomic mass:**

    e. **mole:**

    f. **Avogadro's number:**

    g. **molar mass:**

    h. **isotope:**

    i. **nuclide:**

2. **Determine the number of protons, electrons, and neutrons in each of the following isotopes (you should be able to determine this from your knowledge of the atom and subatomic particles):**
    a. **sodium – 23**

    protons:
    neutrons:
    electrons:

    b.

    $^{42}_{20}\mathbf{Ca}$

    protons:
    neutrons:
    electrons:

3. **What nuclide is used as the standard in the relative scale for atomic masses? What is its assigned atomic mass?**

4. **Fill in the table below for the Mass Numbers of the Hydrogen Isotopes**

	Atomic Number	**Number of Neutrons**	**Mass Number**
Protium			
Deuterium			
Tritium			

5. **Write the nuclear symbol and hyphen notation for each of the following isotopes (so you should have two numbers for each of these):**

    a. **mass number of 28 and atomic number 14**

    b. **26 protons and 30 neutrons**

    c. **56 electrons and 82 neutrons**

6. **Explain each of the following in terms of Dalton's atomic theory:**
    a. **The law of conservation of mass**

    b. **The law of definite proportions**

    c. **The law of multiple proportions**
7. **Describe Thomson's experiment and what he discovered with it.**

8. **Describe Millikan's experiment and what he discovered with it.**

9. **Describe Rutherford's experiment and what he discovered with it.**

10. **How are isotopes of the same element alike? How are they different?**

11. **Describe what the mole is and why it is useful.**

12. **How do molar mass and atomic mass relate? What makes this relationship possible?**

13. **Three isotopes of argon occur in nature. Calculate the average atomic mass of argon to two decimal places, given the following atomic masses and abundances of each of the isotopes: argon-36 (35.97 amu; 0.337%), argon-38 (37.96 amu; 0.063%), and argon-40 (39.96 amu; 99.600%).**

14. Determine the mass in grams of each of the following:

a. **3.00 mol Al**

b. **1.38 mol N**

c. **2.25×10^{24} atoms Zn**

d. **4.65×10^{23} atoms Fe**

15. Determine the moles of each of the following:

a. **40.1 g Ca**

b. **150 g S**

c. **2.25×10^{24} atoms Zn**

d. **4.65×10^{23} atoms Fe**

16. Determine the number of atoms of each of the following:

a. **6.50 mol Cu**

b. **150 g S**

c. **1.75×10^{-6} mol Hg**