**Chemistry Outline Notes**

***Unit 2: Atomic Structure & Nuclear Chemistry***

*Corresponds to “Chapter 4: The Structure of the Atom” & “Chapter 24: Nuclear Chemistry” from textbook.*

### For the Unit:

1. Unit opening page
   1. Name of unit- Atomic Structure & Nuclear Chemistry
   2. Picture

### Each Week:

* Update your table of contents
* Number your pages
* Write neatly

### History of the Atom

1. I can analyze the differences between the atomic models developed throughout history.
   1. Pg. 102-105
      1. Write I can statement
      2. Greek Philosophers
         1. Contrast the ideas about matter of Democritus and Aristotle.
         2. Picture
      3. John Dalton
         1. Describe Dalton’s atomic theory
         2. Explain the law of conservation of mass.
         3. Picture of model/law
   2. Pg. 108-110
      1. J.J. Thomson
         1. Name of the model
         2. Picture of the model
         3. Explain the model in words.
         4. Explain his experiment.
         5. Explain the new discovery about the atom that caused the model to form.
      2. Ernest Rutherford
         1. Name of the model
         2. Picture of the model
         3. Explain the model in words.
         4. Explain the experiment.
         5. Explain the new discovery about the atom that caused the model to form.
   3. Pg. 113
      1. James Chadwick
         1. Picture of the model
         2. Explain the model in words.
         3. Explain the new discovery about the atom that caused the model to form.

### Atomic Structure

1. I can list the basic parts of the atom, including their charge and relative mass, and can determine the number present in an element.
   1. Pg.114-115
      1. Write I can statement.
      2. Picture (hand drawn or computer generated)
         1. Label where the protons, neutrons, and electrons are located.
         2. Copy electron, proton, neutron table from Pg. 114.
      3. Define atomic number.
      4. Write the equation for atomic number.
      5. Write an example of determining the number of protons, number of electrons, and atomic number for an element. Label example.

### Atomic Mass & Isotopes

1. I can evaluate the relationship between atomic mass & mass #.
   1. Pg. 119-121
      1. Write I can statement.
      2. Draw picture (hand drawn or computer generate) of 2 atoms that are isotopes of the same element. Label and explain what is similar and what is different about them.
      3. Define isotope and describe how isotopes come to exist.
      4. Give at least 2 examples of an isotope of the same element.
      5. Define mass number. Give an example of how to calculate a mass #.
      6. Define % abundance,
      7. Define atomic mass. Explain how to calculate the atomic mass based on % abundance.
      8. Do an example problem of how to calculate atomic mass. Label example.
      9. Research a real world example of isotopes or % abundance, who it affects, and why it matters.

**Types of Nuclear Radiation**

1. I can write nuclear equations to show how alpha, beta, and gamma particles are given off from atoms and follow the law of conservation of mass/energy.
   1. Pg. 860-864,869 (Can also refer to Pg. 122-124 after reading previous pages.)
      1. Write I can statement
      2. Explain what a nuclear reaction is.
      3. Describe the process of radioactive decay using the vocabulary words-radioactivity and radiation.
      4. Explain what a nuclear equation consists of and describe how the law of conservation of mass/energy is conserved while writing equations.
      5. Explain alpha particles.
      6. Give an example of alpha decay equation.
      7. Explain beta particles.
      8. Give an example of beta decay equation.
      9. Explain gamma radiation.
      10. Give an example of gamma radiation equation.
      11. Draw picture/diagram/table contrasting radiation types .
      12. Describe how nuclear stability affects radioactivity-Pg. 124
      13. Research and explain a real world example of alpha, beta, or gamma decay.
2. I can create a model that demonstrates the types of nuclear reactions that include different radiations.

### Half-Life

1. I can use a model to determine the half-life of an isotope by after radioactive decay.
   1. Pg. 870-874
      1. Write I can statement.
      2. Define half-life.
      3. Write the equation.
      4. DO an example problem with the equation.
      5. Draw a graph of decay.
      6. Explain the graph (tell what the half-life is and how you can tell.)
      7. Research and explain a real world connection to half-lives.

### Types of Nuclear Reactions

1. I can compare and contrast nuclear fission and fusion, including identifying an equation as fission or fusion.
   1. Pg. 878-885
      1. Write I can statement
      2. Define nuclear fission.
      3. Write an example equation/draw a picture of a fission reaction.
      4. Explain a real world example of fission.
      5. Define nuclear fusion.
      6. Write an example equation/draw a picture of a fusion reaction.
      7. Explain a real world example of fusion.
2. **Current Event**
   1. Find a newspaper, magazine, or internet article **from 2013 to the present** about a topic from this unit
   2. Staple/glue/tape your article in your journal.
   3. Write a couple of bullet points explaining the article.
   4. Write a couple bullet points connecting the article to what we learned in class.
3. **End of Unit**
   1. Concept Map
   2. Review the I can statements throughout unit. Check off topics you are comfortable with, and star the ones you need to study more.
   3. Create a colorful, color-coded study guide using already created notes. (Use highlighters, colored pens.)
      1. Review: History of the Atom, Atomic Structure, Atomic Mass and Isotopes, Types of Nuclear Radiation, Half-life, Types of Nuclear Reactions
   4. Review Bell Work Questions.