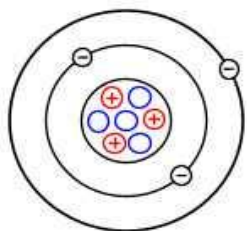


Unit 4: Atomic Structure and the Periodic Table Interactive Study

Part I. How about a little history? Look on my web page for the list of Unit 4 power points. Read the first one titled Unit 4 Atomic Theory #1 and answer the following questions.

1. Who were the first to try to understand matter?
2. In 1803, Dalton proposed that elements consist of individual particles called atoms. Summarize his four hypotheses.
3. In 1897 J.J. Thomson made a unique discovery using a piece of equipment he made called a cathode ray tube. Read over slides 8-14.
 - A. When he added an electric field to his experiment, what charge were the moving pieces?
 - B. What did he name these particles?
 - C. What was the nickname of his model? Briefly explain his model.
4. In 1911, Ernest Rutherford made some more discoveries about atomic structure through his gold foil experiments. Read over slides 15-26.
 - A. Why was his gold foil experiment such a surprise?
 - B. What were Rutherford's three main conclusions? (slide 25)
5. The Bohr model is an easy depiction of the atom and its subatomic particles. Label the protons, neutrons, and electrons in the diagram below.



Time for a self-check! Decide which model of the atom each of the following sentences describes. Fill in the blank before each sentence according to the following key:

DM = Democritus

DL = Dalton

R = Rutherford

T = Thomson

B = Bohr

- _____ 6. Atoms are small, hard particles.
- _____ 7. An atom is the smallest piece of matter.
- _____ 8. An atom contains negatively charged particles called electrons.
- _____ 9. An atom is mostly empty space with a dense, positively charge nucleus in the center.
- _____ 10. Atoms are indivisible.
- _____ 11. Atoms of the same element are exactly the same.
- _____ 12. In an atom, electrons move in definite orbits around the nucleus, much like planets circle the sun.
- _____ 13. An atom is made of positively charged, puddinglike material through which negatively charged particles are scattered.
- _____ 14. In an atom, electrons are located in energy levels that are a certain distance from the nucleus.

Part II. More?? Now for the periodic table history! Read the Unit 4 Periodic Table History power point #2.

1. Dmitri Mendeleev was the first to put a periodic table of elements together. How did he organize and arrange the elements?
2. He was famous for his predictions of unknown elements. What were the names of three elements that when discovered were very close to his predictions.
3. How is the modern periodic table arranged? Who is given credit for this?
4. Briefly identify the basic parts to the chart while using slide 9.
Periods –
Groups –
Representative Elements –
Transition Elements –

Part III. Let's look more closely at the periodic table. Read the Unit 4 Elements, Symbols and the Periodic Table power point #3.

1. What's the proper way to write the symbol of an element?
2. Do Learning Check 1. A. _____ B. _____ C. _____
3. Do Learning Check 2. A. _____ B. _____ C. _____
4. If I know how one element in a group would react, how does that help me to know how another element in that group would react?
5. Where are the representative elements located on the periodic table?
6. Look at slide 14 with the four main representative groups. Which group has the most reactive metals? (Also name it.)
7. Which group has the most reactive non-metals? (Also name it.)
8. Which group is basically non-reactive? (Also name it.)
9. While looking at your periodic table, do Learning Check 3. A. _____ B. _____
10. Do Learning Check 4. A. _____ B. _____ C. _____ D. _____
11. Briefly differentiate between metals and non-metals. Include where they are located on the periodic table.
12. What are the metalloids and where are they found on the periodic table?
13. Do Learning Check 5. A. _____ B. _____ C. _____ D. _____ E. _____ F. _____
14. Do Learning Check 6. A. _____ B. _____

Part IV. Repetition is the BEST teacher! Look at the fourth PowerPoint titled Unit 4: Chemical Families #4. Let's review!

1. What is true about the chemical behavior of elements in the same group/family?
2. Where are the Alkali Metals located on the periodic table?
3. Where are the Alkaline Earth Metals located on the periodic table?
4. Where are the Halogens located on the periodic table?
5. Where are the Noble gases located on the periodic table?
6. What is the name of the group that contains the most reactive non-metals?
7. What is the name of the group that contains the most reactive metals?
8. What is the name of the group that contains the least reactive elements?

Part V. Everyone loves a finale! The last power point is titled Ape-Man and Isotopes! That's right! I saved the best for last 😊 Open the PowerPoint Unit 4 APE-MAN and Isotopes #5.

1. Fill in the table below.

Particle	Symbol	Charge	Relative Mass
Electron			
Proton			
Neutron			

2. Where is each of the subatomic particles located?
3. What would be the overall charge of the nucleus?
4. Notice the periodic table is in order of atomic number. Define atomic number.
5. Do Learning Check 1. A. _____ B. _____ C. _____
6. What would be the net charge of an atom?
7. APE! What does this acronym help you to remember?

8. Mass number. It's the mass of the atom and comes from the two particles that had a relative mass. What were those two particles that make up the mass number.
9. MAN! Can help to remember how to find the mass number OR the number of neutrons. Write down the two ways that MAN can be used.

10. Write the atomic symbol for sodium. Label what the top # and bottom # represent.

11. Define isotope.

12. Compare the two isotopes of chlorine. Which number is the ONLY one that changes?
13. Compare the two isotopes of carbon. Which particles DO NOT change?
14. What is the correct way to write the NAME of an isotope?

15. Do Learning Check 2. A. _____ B. _____ C. _____
16. Do Learning Check 3. A. _____ B. _____ C. _____

17. Do Learning Check 4. A. _____ B. _____ C. _____
18. Do Learning Check 5. A. _____ B. _____ C. _____ D. _____
19. Relative masses of all other atoms were determined by comparing each to the mass of _____.
20. Why is the mass listed on the periodic table a decimal number?
21. What is the weighted average based on?

22. Do Learning Check 6. A. _____ B. _____ C. _____ D. _____ E. _____
23. You must have two things in order to calculate an elements' weighted average. The mass # of each isotope and the % abundance of each isotope. Make a note of the formula to find weighted average.

24. Look at the example on slide 36. After each isotope's mass # and % are multiplied, those values are added. Do you **ever** divide after you've added these together?
25. Do Learning Check 7.