Dougherty Valley HS Chemistry
Atomic Structure Web Quest

Worksheet #1

Name: **Period:** **Seat#:**

Directions: Using the links below, spend some time learning about the history of various atomic structure theories and models. Take some notes and then answer any questions that are asked. Use Google if there is a question that doesn't have an answer somewhere in the videos or readings!

1st – Video	**2nd – Video**	**3rd – Reading**	**4th – Reading**
The 2,400 Year Search for the Atom https://tinyurl.com/3te9zxfy	Models of the Atom Timeline https://tinyurl.com/yc4vbp74	Historyville – A History of Atomic Theory https://tinyurl.com/bz7j2uyj	Chemistry God – Rutherford's Gold Foil https://tinyurl.com/2dp8aa6v

Notes on the videos and articles to help you focus, process, and retain the information covered.

Democritus – "Atomos" and Aristotle – The Elements

1) Democritus and Aristotle were contemporaries. Which philosopher's theory was more accepted? Why is this funny in hindsight?

John Dalton – Indivisible Atoms – "Billiard Ball Model"

Dalton's Five Postulates – *The way they are written in the article are a bit too simple for Honors Level Chemistry. These are phrased better:*

1. Matter is made up of atoms that are indivisible and indestructible.
2. All atoms of a specific element are identical.
3. Atoms of different elements have different weights and different chemical properties.
4. Atoms of different elements combine in simple whole number ratios to form compounds.
5. 5. Atoms cannot be created or destroyed. They can only be rearranged into new compounds.

2) Looking at Dalton's Postulates you summarized, which two are no longer considered valid? Think about what we know about the atom in our modern times!

J.J Thomson – Discovery of the Electron – "Plum Pudding" (Chocolate Chip Cookie) Model

3) "Atoms are small, indivisible particles. There is nothing smaller than an atom."
Why would Thomson disagree with this statement?

4) Describe how Thomson found the subatomic particle, name the piece of equipment he used.

Ernest Rutherford – Discovery of Nucleus

5) What was the name of Rutherford's most famous experiment?

6) What did Rutherford conclude was in the middle of the atom?

7) Describe and/or illustrate what Rutherford's experiments looked like.

8) Why did most of the alpha particle go through the gold foil?

9) J.J. Thomson said the atom is filled with "positive sea" with small, negative particles called electrons. Would Rutherford agree or disagree with this statement? Why?

Neils Bohr – Planetary Model

10) Bohr thought that electrons are arranged in what?

11) Why does Bohr's model often describe electrons like planets orbiting the sun?

Schrödinger – Quantum Wave Mechanics Model

12) Shrodinger helped describe the behavior of which particle by using complex math?

13) Shrodinger disproved which aspect of Bohr's Model? Describe what Bohr thought the electrons do versus what Schrodinger thought.

Chadwick – Discovery of the Neutron

14) What is the charge on a neutron?

15) The discovery of the neutron helped explain the existence of what?

Directions: Using what you saw and learned from the videos and articles, draw and label each model of the atom listed below. Add color in a meaningful way to enhance and/or label your model. Indicate what the advancement/discovery/change was from the previous model when asked.

<table>
<tr><th colspan="3">Atomic Models
Throughout History</th></tr>
<tr><td>Democritus</td><td>Aristotle</td><td>Dalton's "Billiard Ball" Model</td></tr>
<tr><td colspan="2">J.J Thomson's "Plum Pudding" Model

Advancement from Dalton's Model:</td><td>Rutherford's Model

Advancement from J.J Thomson's Model:</td></tr>
<tr><td colspan="2">Bohr's "Planetary" Model

Advancement from Rutherford's Model:</td><td>Schrödinger's Quantum Wave Model

Advancement from Bohr's Model:</td></tr>
<tr><td colspan="2"></td><td>And just because everyone always forgets about poor Chadwick...draw a nucleus showing two protons and three of the particles he found. Label them.
☺</td></tr>
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