**Atomic Theory Web Quest**

Material Taken from “Atomic Theory Web Quest For High School Chemistry Students” designed by Kelly Rupp and Jeremy Smith

Introduction

If you were asked to draw the structure of an atom, what would you draw? Throughout history scientists have accepted five atomic models. Our perception of the atom has changed from the early Greek model because of clues or evidences that have been gathered through scientific experiments. As more evidence was gathered old models were discarded or improved upon. Your goal is to trace the atomic theory through history.

Task

You and your partner will use the sources provided to develop a briefing that outlines the key scientists and experiments associated with the development of modern atomic theory. The briefing should include the names of the scientists, a description of the accomplishments, pictures of experimental equipment or atomic models, and description. The briefing will contain research data sheets, a timeline and a set of pictures to model the changing ideas of the atom.

Process

1. Read the entire Web Quest!!!!!!!!!!!!!!
2. Begin your research by using your textbook (chapters 4, 5 and 6) and the links provided in the resource section of the web quest to complete a research data sheet for each of the following 24 scientists, experiments, and atomic models:

|  |  |  |
| --- | --- | --- |
| Democritus J.J. Thomson Alchemists Gold Foil Experiment Cathode Ray Tube Law of Definite Proportions Plum Pudding Atomic Model Planetary Model | Robert Millikan James Chadwick Erwin Schrodinger Oil Drop Experiment Law of Conservation of Mass Dalton's Atomic Theory Nuclear Model Quantum Mechanical Model | Antoine Lavoisier Ernest Rutherford Dmitri Mendeleev  Niels Bohr Henry Moseley Werner Heisenberg Joseph Louis Proust John Dalton |

1. Prepare a timeline:
   1. It should include information from your [research data sheets](http://www2.yk.psu.edu/~mer7/ruppquest/researchdatasheet.doc) presented in chronological order to illustrate your information.
   2. In 1-2 sentences tell the importance of the discovery that relates to the structure of the atom (some of these people did many types of research)

*A timeline is in chronological order – earliest time to latest time. Because you are going to keep your comments to 1-2 sentences, a graph or report will not be appropriate. If you would prefer to do a PowerPoint presentation or chart, please discuss with the teacher and get pre-approval.*

*Example:*[*Food Timeline*](http://www.foodtimeline.org/) *http://www.foodtimeline.org/*

[Timeline Tool](http://timeline.thinkport.org/) <http://timeline.thinkport.org/> [This tool is wonderful!]

1. Draw a set of five pictures to represent the changing ideas of the atom. Each picture should be labeled with the parts of the atom that are significant for that model, along with a date for its development and the name of the scientist credited with that particular model.

Resources

[Atom - The Incredible World](http://library.thinkquest.org/19662/low/eng/index.html)  
http://library.thinkquest.org/19662/low/eng/index.html

[The Atom - Info and Democritus, Plum Pudding, Rutherford Models](http://www.lbl.gov/abc/wallchart/chapters/02/1.html)  
http://www.lbl.gov/abc/wallchart/chapters/02/1.html

[History of the electron](http://www.aip.org/history/electron/jjhome.htm)  
http://www.aip.org/history/electron/jjhome.htm

[JJ Thompson](http://www.aip.org/history/electron/jjelectr.htm)  
http://www.aip.org/history/electron/jjelectr.htm

[Timeline](http://www.rsc.org/chemsoc/timeline/pages/timeline.html)  
http://www.rsc.org/chemsoc/timeline/pages/timeline.html

[Atomic Theory 1: The early days](http://www.visionlearning.com/library/module_viewer.php?mid=50)  
http://www.visionlearning.com/library/module\_viewer.php?mid=50

[Atomic Theory 2: Electrons in Atoms](http://www.visionlearning.com/library/module_viewer.php?mid=51)  
http://www.visionlearning.com/library/module\_viewer.php?mid=51

[Google Image Search](http://www.google.com/imghp?hl=en)  
http://www.google.com/imghp?hl=en

[The Bohr Atom. N. De Leon](http://www.iun.edu/~cpanhd/C101webnotes/modern-atomic-theory/Bohr-model.html)  
http://www.iun.edu/~cpanhd/C101webnotes/modern-atomic-theory/Bohr-model.html

[Leucippus and Democritus](http://www.thebigview.com/greeks/democritus.html)  
http://www.thebigview.com/greeks/democritus.html

[Dalton's Atomic Theory. Hal Bender](http://dl.clackamas.cc.or.us/ch104-04/dalton's.htm)  
http://dl.clackamas.cc.or.us/ch104-04/dalton's.htm

[Dalton's Atomic Theory. N. De Leon](http://www.iun.edu/~cpanhd/C101webnotes/composition/dalton.html)  
<http://www.iun.edu/~cpanhd/C101webnotes/composition/dalton.html>

[Atoms](http://learnchem.net/tutorials/atoms.shtml)—from Learnchem.net, part of the NeoPages Network.

[Dalton's Atomic Theory](http://antoine.frostburg.edu/chem/senese/101/atoms/index.shtml)—from "General Chemistry Online!"—created by Fred Senese at Frostburg State University.

[Elements and Atoms: Case Studies in the Development of Chemistry](http://web.lemoyne.edu/~giunta/ea/contents.html)—part of Carmen Giunta's Classic Chemistry at Le Moyne College.

[John Dalton](http://www.chemheritage.org/discover/chemistry-in-history/themes/the-path-to-the-periodic-table/dalton.aspx)—part of *Chemical Achievers*, from the Chemical Heritage Foundation.

[My Brother, John](http://www.woodrow.org/teachers/ci/1992/Dalton.html)—a fictionalized account as might have been penned by Dalton's brother, written by Judy Moody and Bette Bridges for the Woodrow Wilson Leadership Program in Chemistry.

[Researches on Copper](http://web.lemoyne.edu/~giunta/proust.html) and [*Sur les mines de cobalt, nickel et autres*](http://wayback.archive-it.org/2118/20100924225903/http:/webserver.lemoyne.edu/faculty/giunta/proust2.html)—two papers by Joseph-Louis Proust, hosted by Carmen Giunta's Classic Chemistry from Le Moyne College.

Evaluation

The following rubric will be used to evaluate your briefing:

**Atomic Theory Webquest Grading Rubric**

**Name(s): Hour Score**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Activity** | **Exemplary** | **Proficient** | **Partially Proficient** | **Incomplete** | **Points** |
| **Research Data Sheets** | ***15 points***  Research data sheet entries have been made for all 24 items in 15 sections and were submitted for checking by the due date. | ***10-14 points***  Research data sheet entries have been made for 18-23 items and were submitted for checking by the due date. | ***5-9 points***  Research data sheet entries have been made for 10-17 items and were submitted for checking by the due date. | ***0-4 points***  Significant amounts of the research has not been completed. Research data sheets were not submitted for checking by the due date. |  |
| **Timeline** | ***13-15 points***  All items are included and information is factual. Related concepts are grouped together. The information is presented in chronological order. | ***9-12 points***  All items are included but minor errors exist in the facts presented and/or related concepts are not grouped and/or placed in chronological order. | ***5-8 points***  Some of the information is missing and /or more significant errors exist in the grouping or order of the info. OR, there is *excessive data* on at least 3 dates. | ***0-4 points***  Some information is missing and/or major errors are present in the facts presented, grouping or order of the information OR, there is *excessive data* on several dates. |  |
| **Pictures** | ***10 points***  Pictures of atomic models have been included for each of the 5 models and correctly labeled, dated and credited to the appropriate scientist(s). | ***8 points***  Missing a few pieces of information or it is difficult to read your information and/or see pictures. | ***6 points***  Missing a picture of a model or a significant amount of information and/or there are some dates difficult to read. | ***0-4 points***  The information is impossible to read and/or many pictures are missing. |  |
| **Citations** | ***Your project will not be accepted if you do not include citations for every topic. State clearly which document gave you the information for every scientist.*** | | | |  |
| **Total** | ***30 points*** | | | |  |

Conclusion

After completing your projects you should be able to: 1) Demonstrate your understanding of the people and experiments involved in the history of the development of atomic theory. 2) Demonstrate your knowledge of the history of the atomic theory by constructing a chronological order of events. 3) Demonstrate an understanding of the present model of the atom by identifying the parts of the atom, the subatomic particle charges, and the relative location of each particle according to your models.