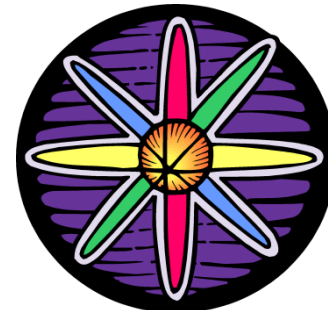


The History of the Atom Web quest!

You are responsible for completing the History of the Atom worksheet. EACH PERSON must complete their own copy. Use the internet to find information.

Most of us take it for granted that we know what an atom looks like. But have you ever wondered *how* scientists have figured out so much about these particles that we can't even see?

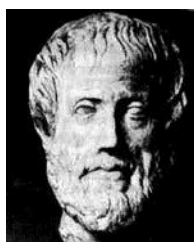


In a way, the scientists who have unraveled the properties of the atom have been like detectives solving parts of a mystery with new mysteries arising out of every discovery.

In this web quest, you are going to find out how our modern view of the atom has developed throughout history by looking at the four most important discoveries. Answer the questions throughout the webquest and then you should be able to use those answers to fill in your worksheet.

You may use any resource you wish to help you answer the questions in this web quest (you can find lot's of stuff if you want to [search the web](#)). Some useful links have been provided for each scientist. Good Luck!

- **Democritus & Aristotle (~400 B.C.E.)**



Democritus was the first person (that we know of) to teach the idea that there are tiny fundamental particles from which all matter

is made. Unfortunately, Aristotle didn't share his view and, since Aristotle was so highly respected, his views were accepted for nearly 2000 years.

Useful Sites

Early Greek views of the atom <http://northspringer.tripod.com/HistoryofAtom/>

Democritus through Dalton http://www.visionlearning.com/library/module_viewer.php?mid=49

1. What 4 elements did people at this time believe that all matter is made up of?
2. What did Democritus call the tiny fundamental particles of matter?



John Dalton (1766-1844)

It wasn't until about 2000 years after the Greek philosophers when scientists started to use experimentation to explain their theories. By using the newly discovered concept of the *law of conservation of matter* along with some of his own work, Dalton revisited some of Democritus' ideas.

Useful Sites

Dalton site at Frostburg University <http://antoine.frostburg.edu/chem/senese/101/atoms/dalton.shtml>

Guch's explanation of the difference between the two laws <http://misterguch.brinkster.net/q14.html>

Dalton's Atomic Theory <http://dl.clackamas.cc.or.us/ch104-04/dalton's.htm>

More on Dalton <http://www.iun.edu/~cpanhd/C101webnotes/composition/dalton.html>

A good "visual" on the law of definite proportions –scroll down a little
http://www.visionlearning.com/library/module_viewer.php?c3=&mid=49&l

Explanation of the law of multiple proportions <http://www.learnchem.net/tutorials/atoms.shtml>

Questions to Answer

1. What were the 5 most important points in Dalton's atomic theory?
2. Which points have been proven false?
3. What does the law of multiple proportions say?
4. What does the law of definite proportions say?
5. Draw/Describe a model for Dalton's atom.



J.J. Thomson (1856-1940)

Dalton's atomic model held up for a good hundred years until J.J. Thomson did some experiments with his newly discovered "cathode rays".

Useful Sites

Brief overview of Thomson's experiments and findings

<http://science.howstuffworks.com/atom5.htm>

An in depth look at how Thomson came to his conclusions best site

<http://www.aip.org/history/electron/jirays.htm>

Thomson's view of the atom <http://antoine.frostburg.edu/chem/senese/101/atoms/slides/sld008.htm>

Questions to Answer

1. Name and describe Thomson's experiment.
2. List 3 discoveries from the experiment.
3. Draw/describe Thomson's model of the atom.



Ernest Rutherford (1871-1937)

Rutherford's famous "gold foil" experiment allowed him to test for the undiscovered particle that the Thomson model could only guess at. (Note: the term *alpha particle* is mentioned a lot in these sites. All they mean is a helium

atom that doesn't have any electrons so it is a small particle of purely positive charge.)

Useful Sites

An interactive of Rutherford's "Gold Foil" experiment

<http://micro.magnet.fsu.edu/electromag/java/rutherford/>

How Rutherford's experiment changed Thomson's view

<http://www.iun.edu/~cpanhd/C101webnotes/modern-atomic-theory/rutherford-model.html>

Here's a picture interpreting the "gold foil" experiment

http://www.visionlearning.com/library/module_viewer.php?c3=&mid=50&l

Overview of Rutherford and experiment <http://www.physics.rutgers.edu/meis/Rutherford.htm>

<http://www.mhhe.com/physsci/chemistry/essentialchemistry/flash/ruther14.swf>

Questions to Answer

1. Describe Rutherford's experiments with gold foil.

2. What did this show about how atoms are organized? (Draw a diagram if this helps you to explain the experiment.) Include 3 discoveries.

3. Draw/describe a model for Rutherford's atom.

James Chadwick

1. What did Chadwick discover?



Niels Bohr (1885-1962)

Useful Sites

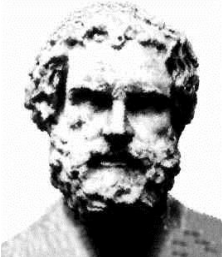

The Bohr model <http://regentsprep.org/Regents/physics/phys05/catomodel/bohr.htm>

Interactive on Bohr atom – you'll find this about halfway down the page.
http://www.visionlearning.com/library/module_viewer.php?c3=&mid=51&l

Questions to Answer

1. Describe Bohr's model of the atom. How does his model explain atomic spectra?

HISTORY OF ATOMIC THEORY

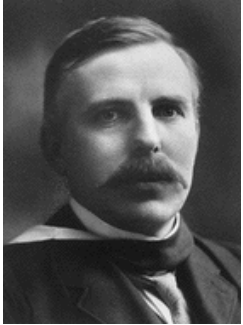
Scientist	Observations or Experimental evidence for Atomic Model	Atomic Model Diagram	List of subatomic particles included in the model	Explain the difference between this model and the previous model (if there is one)
 <p>Democritus ~ 450 B.C.</p>				
 <p>John Dalton ~ 1803</p>				



JJ Thompson ~ 1895



Robert Millikan ~1910



Ernest Rutherford ~ 1910



Niels Bohr ~ 1922



Erwin Schrödinger ~ 1926



James Chadwick ~ 1932
