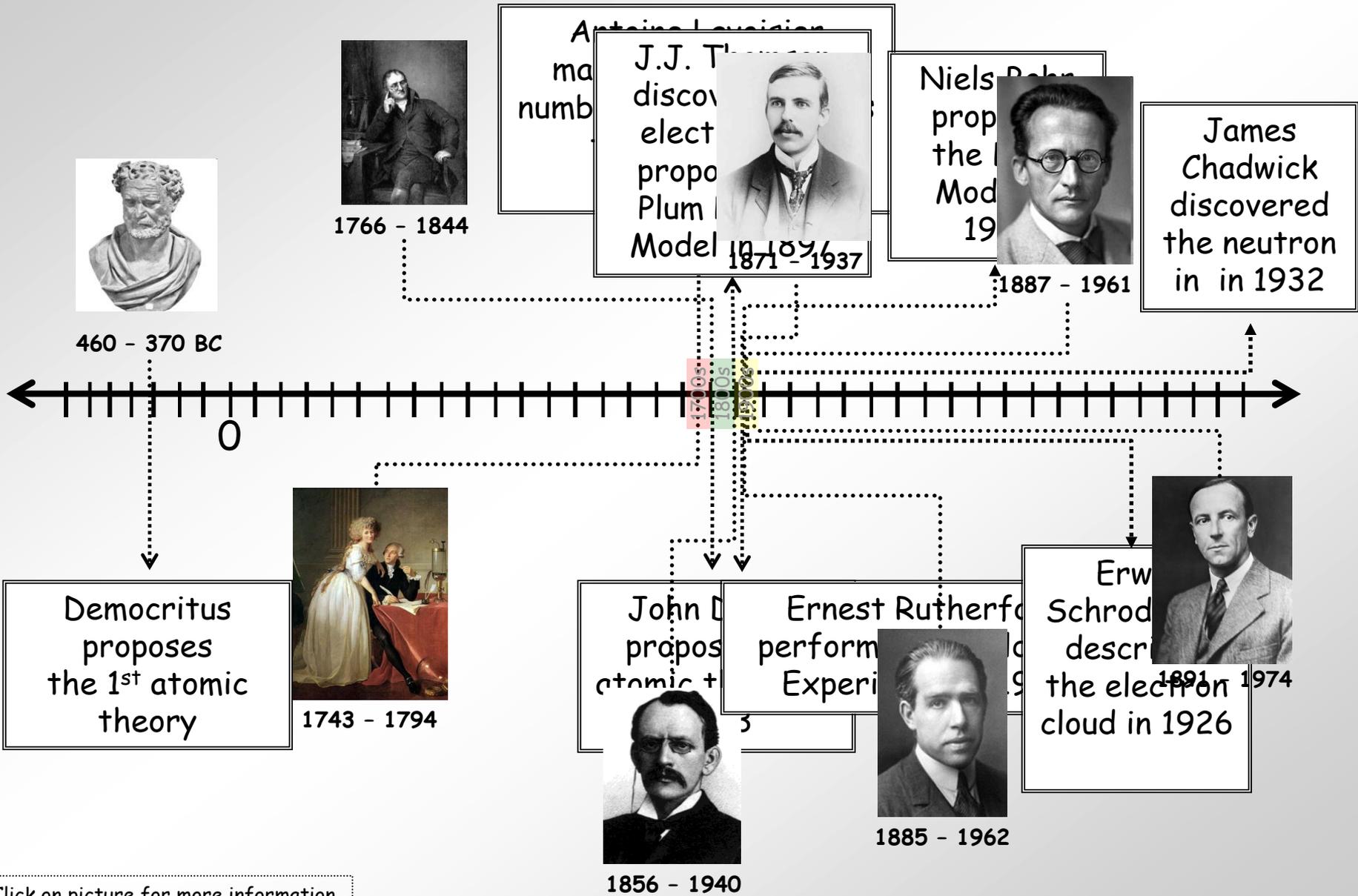


History of the Atom

Scientists and Their Contribution to
the Model of an Atom

History of the Atom - Timeline



Click on picture for more information

Democritus

(460 BC - 370 BC)

- Proposed an Atomic Theory (along with his mentor Leucippus) which states that all atoms are small, hard, indivisible and indestructible particles made of a single material formed into different shapes and sizes.
- Aristotle did not support his atomic theory



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Antoine Lavoisier

(1743 - 1794)



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www.ideo.columbia.edu/.../v1001/geo/time2.html

- Known as the "Father of Modern Chemistry"
- Was the first person to generate a list of thirty-three elements in his textbook
- Devised the metric system
- Was married to a 13-year old Marie-Anne Pierette Paulze; she assisted him with much of his work
- Was a tax-collector that was consequently guillotined during the French Revolution
- Discovered/proposed that combustion occurs when oxygen combines with other elements
- Discovered/proposed the Law of Conservation of Mass (or Matter) which states, in a chemical reaction, matter is neither created nor destroyed



John Dalton

(1766 - 1844)

- In 1803, proposed an Atomic Theory which states:
 - All substances are made of atoms; atoms are small particles that cannot be created, divided, or destroyed.
 - Atoms of the same element are exactly alike, and atoms of different elements are different
 - Atoms join with other atoms to make new substances
- Calculated the atomic weights of many various elements
- Was a teacher at a very young age
- Was color blind

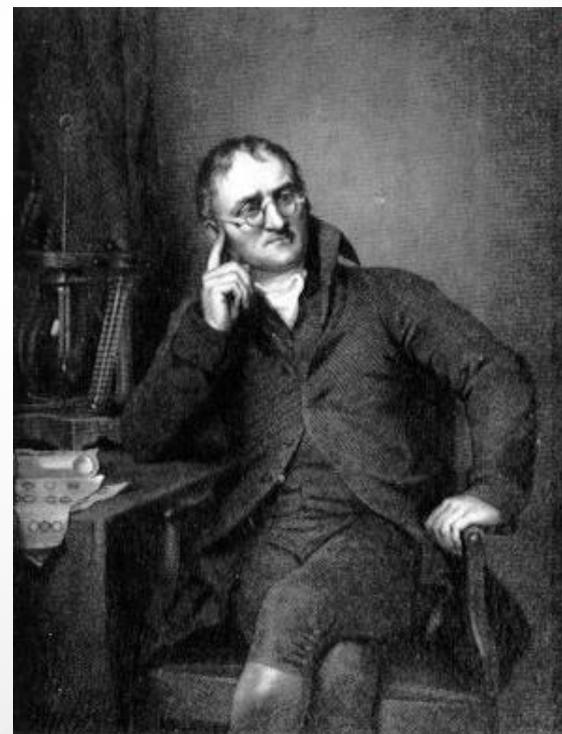


Image taken from:
chemistry.about.com/.../John-Dalton.htm



J.J. Thomson

(1856 - 1940)



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www.wired.com/.../news/2008/04/dayintech_0430

- Proved that an atom can be divided into smaller parts
- While experimenting with cathode-ray tubes, discovered corpuscles, which were later called electrons
- Stated that the atom is neutral
- In 1897, proposed the Plum Pudding Model which states that atoms mostly consist of positively charged material with negatively charged particles (electrons) located throughout the positive material
- Won a Nobel Prize



Ernest Rutherford

(1871 - 1937)

- In 1909, performed the Gold Foil Experiment and suggested the following characteristics of the atom:
 - It consists of a small core, or nucleus, that contains most of the mass of the atom
 - This nucleus is made up of particles called protons, which have a positive charge
 - The protons are surrounded by negatively charged electrons, but most of the atom is actually empty space
- Did extensive work on radioactivity (alpha & beta particles, gamma rays/waves) and was referred to as the "Father of Nuclear Physics"
- Won a Nobel Prize
- Was a student of J.J. Thomson
- Was on the New Zealand \$100 bill

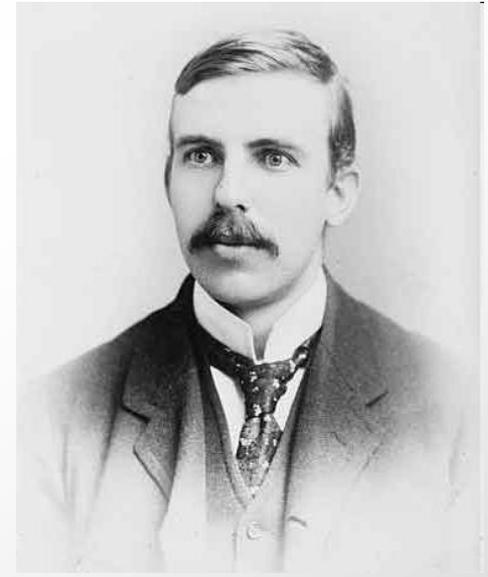


Image taken from:
<http://www.scientific-web.com/en/Physics/Biographies/ErnestRutherford.html>



Niels Bohr

(1885 - 1962)



Image taken from:
commons.wikimedia.org/wiki/File:Niels_Bohr.jpg

- In 1913, proposed the Bohr Model, which suggests that electrons travel around the nucleus of an atom in orbits or definite paths. Additionally, the electrons can jump from a path in one level to a path in another level (depending on their energy)
- Won a Nobel Prize
- Worked with Ernest Rutherford



Erwin Schrodinger

(1887-1961)

- In 1926, he further explained the nature of electrons in an atom by stating that the exact location of an electron cannot be stated; therefore, it is more accurate to view the electrons in regions called electron clouds; electron clouds are places where the electrons are likely to be found
- Did extensive work on the Wave formula → Schrodinger equation
- Won a Nobel Prize



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[nobelprize.org/.../1933/schrodinger-bio.html](https://www.nobelprize.org/.../1933/schrodinger-bio.html)



James Chadwick

(1891 - 1974)



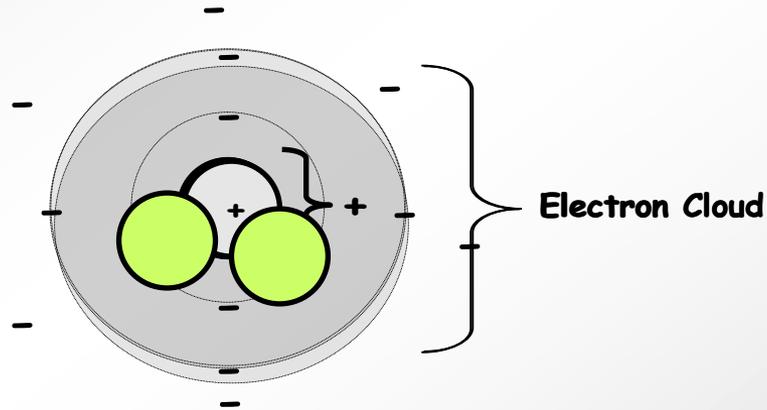
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[www.wired.com/.../news/2009/02/d
ayintech_0227](http://www.wired.com/.../news/2009/02/d
ayintech_0227)

- Realized that the atomic mass of most elements was double the number of protons → discovery of the neutron in 1932
- Worked on the Manhattan Project
- Worked with Ernest Rutherford
- Won a Nobel Prize



Progression of the Atomic Model



The structure of an atom, according to:

~~Democritus~~
~~Ernest Rutherford~~
John Dalton