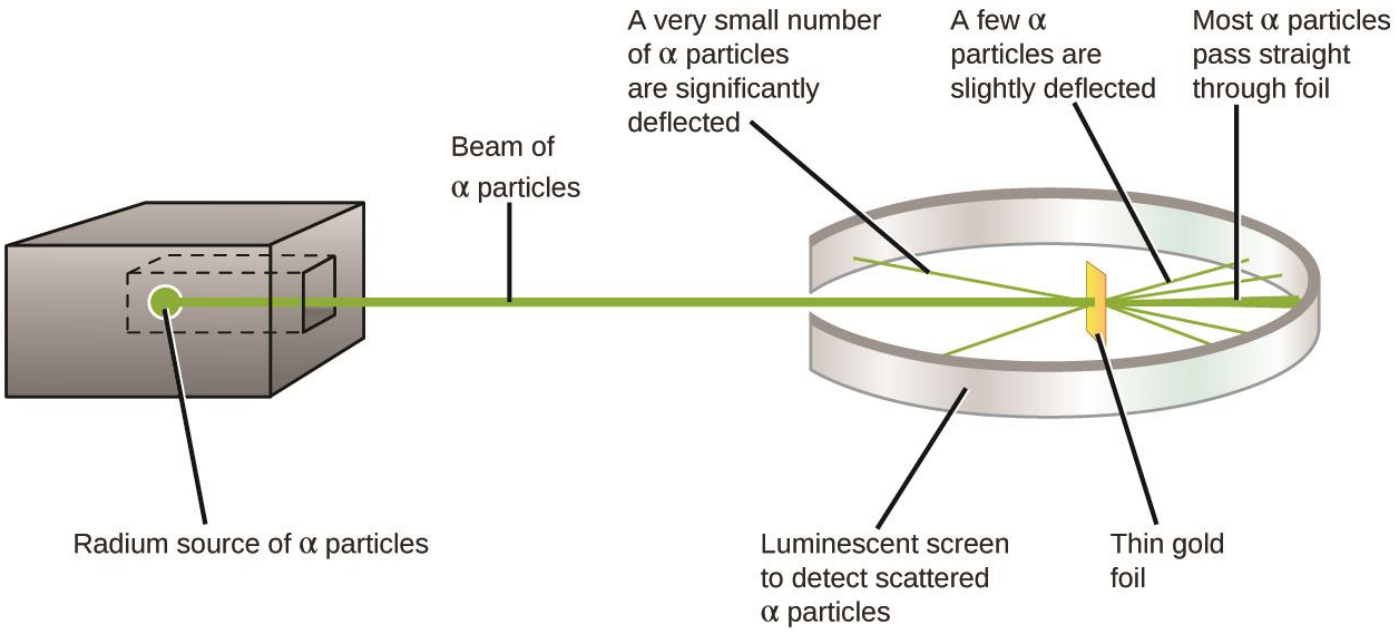
CLASS NOTE 3.1.2019



Radioactive alpha particle source coming from black box (on left)
Alpha particle are simply helium nuclei generated from the decay of radium nuclei.
These alpha particle were focused at or (fired) at he thin sheet of Gold (Au).
Most alpha particles passed straight through the gold…bizarre to Rutherford and his team of Cambridge University Physicists. The atom had to be mostly empty space.
A few alpha particles bounced almost straight back. They had discovered the nucleus!
The luminescent screen was made fluorescent materials so it would glow when struck by a scattered alpha particle.

Rutherford quotes:

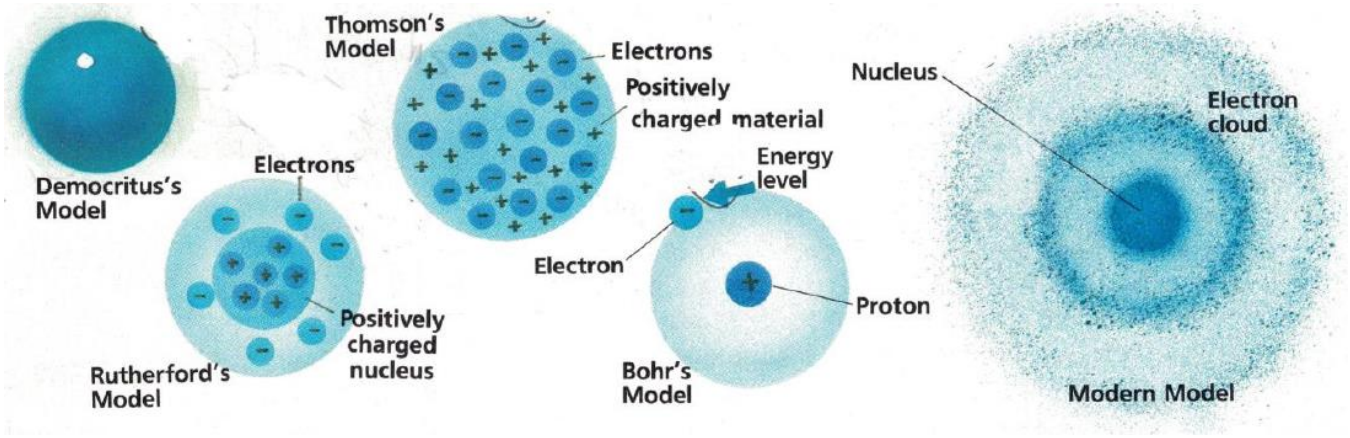
"It was quite the most incredible event that has ever happened to me in my life. It was almost as incredible as if you fired a 15-inch shell at a piece of tissue paper and it came back and hit you."

"I know what the atom looks like!"

"When we have found how the nucleus of atoms is built up we shall have found the greatest secret of all — except life. We shall have found the basis of everything — of the earth we walk on, of the air we breathe, of the sunshine, of our physical body itself, of everything in the world, however great or however small — except life". David Wilson, *Rutherford, Simple Genius* (1983)

4. The number of electron shells an atom has depends upon the number of electrons that the atom has. In general, each shell must have its full number of electrons before a new shell starts. If there are more electrons than a shell can hold, a new shell starts. **True or false <- circle one**

MODELS OF THE ATOM THROUGHOUT HISTORY



Fill in the physicists' name for each of the below passages. (Hint see scientist names above)

5. _____ was able to arrive at his model of the atom through careful observations using a cathode ray tube. He called it plum pudding; positive pudding with negative electrons scattered throughout.
A. Dalton **B**. Thomson **C**. Rutherford **D**. Bohr

6. _____ utilized radioactive decaying material to fire alpha particles at a sheet of gold to arrive at his model. Most of the alpha particles went right through. A few smashed into a densely packed positive nucleus.
A. Dalton **B**. Thomson **C**. Rutherford **D**. Bohr

7. _____ model paved the way for the present day Modern Model of the atom. He and others proposed electron energy levels or *quanta* to explain the structure of the atom.
A. Dalton **B**. Thomson **C**. Rutherford **D**. Bohr

8. In 1808 Dalton was able to further our understanding of the atom by using advanced microscopes to observe deep inside matter to determine the structure of the nucleus. **True or false <-circle**

9. The Greeks like Democritus are some of the first to be credited with imagining models of the atom. **True or false <- circle**

10. The Modern Model relies on the theory of quantum mechanics to explain how electrons exist in an atom. **True or false <- circle**

Model activity Review 3.1.2019

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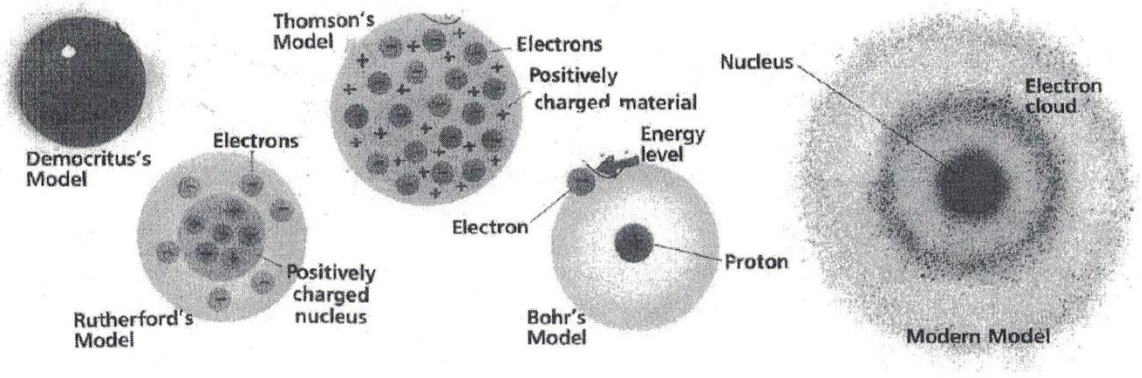

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