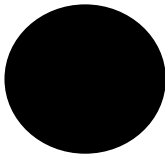
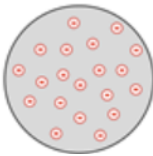
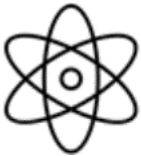



Models of the Atom

Read from **Lesson 1: In Search of the Atom** in the **Chemistry Tutorial Section, Chapter 3 of The Physics**

Classroom: Part a: [Democritus to Dalton](#)

Part b: [The Inside Story of the Atom](#)

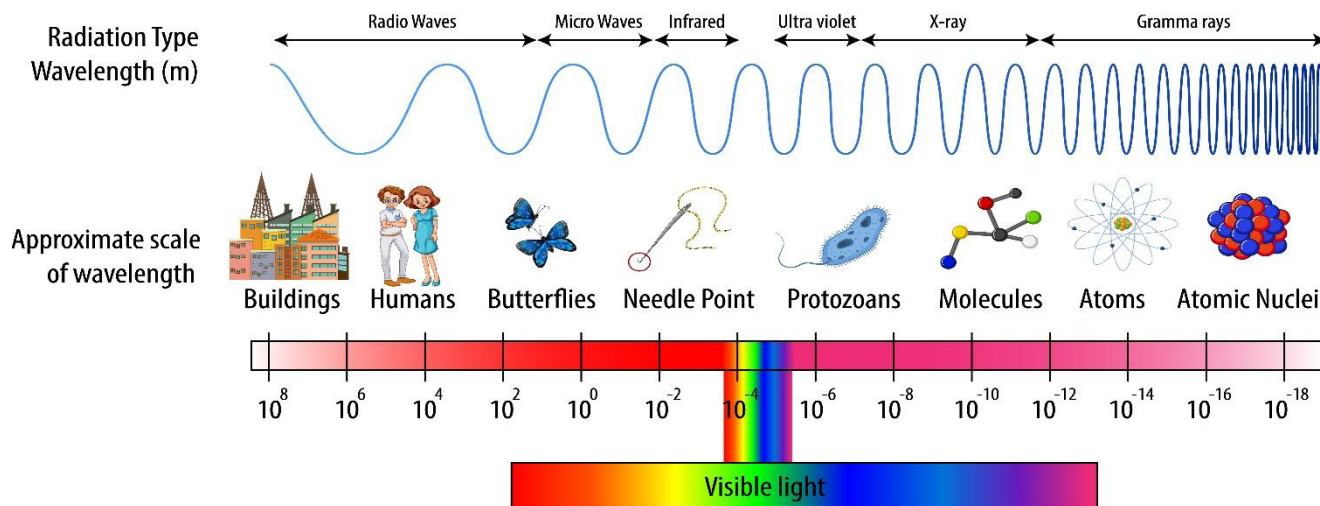
Atom				
Scientist	John Dalton 1803	J.J. Thomson 1897	Ernest Rutherford 1911	Neils Bohr 1913
Model Name	Indivisible Atoms	Plum Pudding Model	Nuclear Model	Quantum Model
Experimental Observation	Matter is conserved in a chemical reaction.	Cathode rays are deflected by electric and magnetic fields.	Most alpha particles pass through gold foil, but a few are deflected.	Atoms absorb/emit packets of energy when electrons change energy levels, as evidenced by spectral lines.
Conclusion	Atoms are indivisible spheres.	There are small, negatively charged particles contained in the atom.	Atoms are mostly empty space with a small, dense, positively charged nucleus.	Electrons orbit the nucleus with certain specific energies.

Review the lessons and this table to answer the following questions about the different models of the atoms.

- Which model first mentioned electrons as subatomic particles?
- Which charged subatomic particle is located in the small dense region of the atom discovered in Rutherford's experiments?
- In what way does the Bohr model agree with the Thomson model?
- Aaron Agin states that Dalton predicted that atoms were made of three types of subatomic particles. Is he correct? Why or why not?
- Why did Thomson's model of the atom need to be modified? Which model gave the evidence for this modification and how did it do so?
- True or False: Rutherford's experiment proved that electrons orbit a small dense core in the atom.
- Bohr's model of the atom failed to explain spectral lines for _____.

Early Models of the Atom

The Electromagnetic Spectrum



Source: www.freepik.com

Review the lessons and this table to answer the following questions about the electromagnetic spectrum and energy levels.

- All types of electromagnetic waves can be produced when electrons move from _____ energy levels to _____ energy levels.
- Which type of electromagnetic radiation has the shortest wavelength? Lowest energy? Which visible color has the highest energy?
- Why are spectral lines formed when an electron returns to its ground state?
- Which type of electromagnetic radiation would most likely be formed when an electron moved from the highest possible energy level to the lowest possible energy level in an atom?
- Three chemistry students, Molly Cule, Flo Wrene, and Earl Enmeyer are observing spectral lines produced by a hydrogen lamp. They discuss the formation of a bright red line in hydrogen's spectrum. Molly notes that this line has the lowest energy compared to the other colors in the spectrum. Flo claims that this line results from the smallest transition of an electron from an excited state to the ground state. Earl asserts that energy is absorbed when the red line is formed. Who is correct and who is incorrect? Justify your answers.