



**Subject:** Chemistry  
**Title:** History of the Atom  
**Ages:** 15-18

## Description

This infographic presents the theories that have been formulated about the structure of the atom. Each theory is accompanied with a basic description and a comparison is sought between them.

## Objectives

After the completion of this lesson, students will be able to:

- Understand the differences between the pre-quantum and quantum theories.
- Understand the experimental data that led to the progress of the theories.
- Describe the structural components of matter as well as their properties.

## Activities

1. *Democritus' theory:* Students have to think about how small matter can get, to understand the meaning of the word 'atomos' and to understand that this specific theory was impossible to prove.
2. *Dalton's theory:* Students have to discuss the reason that Dalton is considered as the father of the atomic theory despite the fact that Democritus had the original idea.
3. *Thomson's theory:* The teacher introduces the discovery of electrons and challenges students to consider the structure of plum pudding in order to explain the specific theory.
4. *Rutherford's model:* The teacher asks students to enlarge the atom to the size of football court in order to understand that the nucleus will be the size of a ping-pong ball. The students watch the animated video of Rutherford's model.
5. *Bohr's model:* Students have to observe images of the last two models and discuss the similarities and differences. Students have to explore the structure of different atoms through the simulation link.
6. *Quantum Mechanical model:* The teacher asks students to observe specific images with different meanings in order to introduce the double nature of an electron. Students have to understand that electrons exist as 'probability clouds.'

## Project

As a follow up project, students can:

- Watch a 3D animation about the progress of the different theories and make a comparison map.
- Evaluate their knowledge through the quiz link.
- Investigate images with different meanings and relate them to the quantum mechanical model.
- Work in teams in order to investigate the explanation in the literature of the word 'uncertainty' and to compare this explanation with the nature of the electron.
- Apply the theory of electronic construction of atoms to understand the structure of the periodic table.

## Curators

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