

Atomic Theory

- I. **Handout:** [Condensed Unit Notes](#)
- II. Black Box Model
- III. Early Theories - 400 B.C.
 - i. Common Greek theory was that all matter consisted of four "elements" - earth, air, fire, and water.
 - ii. **Democretus** (460-360 BC)
 - I. A philosopher/scientist who theorized that all matter was made of indivisible particles (atoms).
 - II. His theory was based on logical reasoning, not empirical data. Philosophers/scientists of this time period did not think doing experiments was necessary. They thought you could reach the truth by pure logical reasoning. It's interesting to note how right he may have been.
 - iii. Alchemy, the process of changing base metals to gold, was the chief form of experimentation from this time period until the late 1600's.
- IV. **Robert Boyle** (1622 - 1691)
 - I. He defined the term element - a substance that cannot be broken down into more simpler substances.
 - II. He also did some pioneering work in the area of gas pressures, but we will talk about that later.
- V. **Antoine Lavoisier** (1743 - 1797)
 - I. He is considered to be the pioneer of modern chemistry.
 - II. He used the scientific method and did careful and controlled experiments.
 - III. Because of his methods he was able to determine correctly what was happening during the combustion of metals. Stemming from this work and other experiments, he is credited with developing evidence for the **Law of Conservation of Mass in 1777**.
 - IV. The Law of Conservation of Mass states that during chemical reactions matter is neither created or destroyed. The mass of the reactants should be equivalent to the mass of the products.
 - i. **Lab:** [Does Mass Change During Chemical Reactions?](#)
 - ii. **Film:** Lavoisier as the father of modern chemistry.
 - iii. **Homework:** Does Mass Change During Chemical Reactions [Lab Questions](#).
- VI. **Joseph Proust** (1754 - 1826)
 - I. He first published his **Law of Definite Proportions** (or Law of Constant Composition) in **1794**.