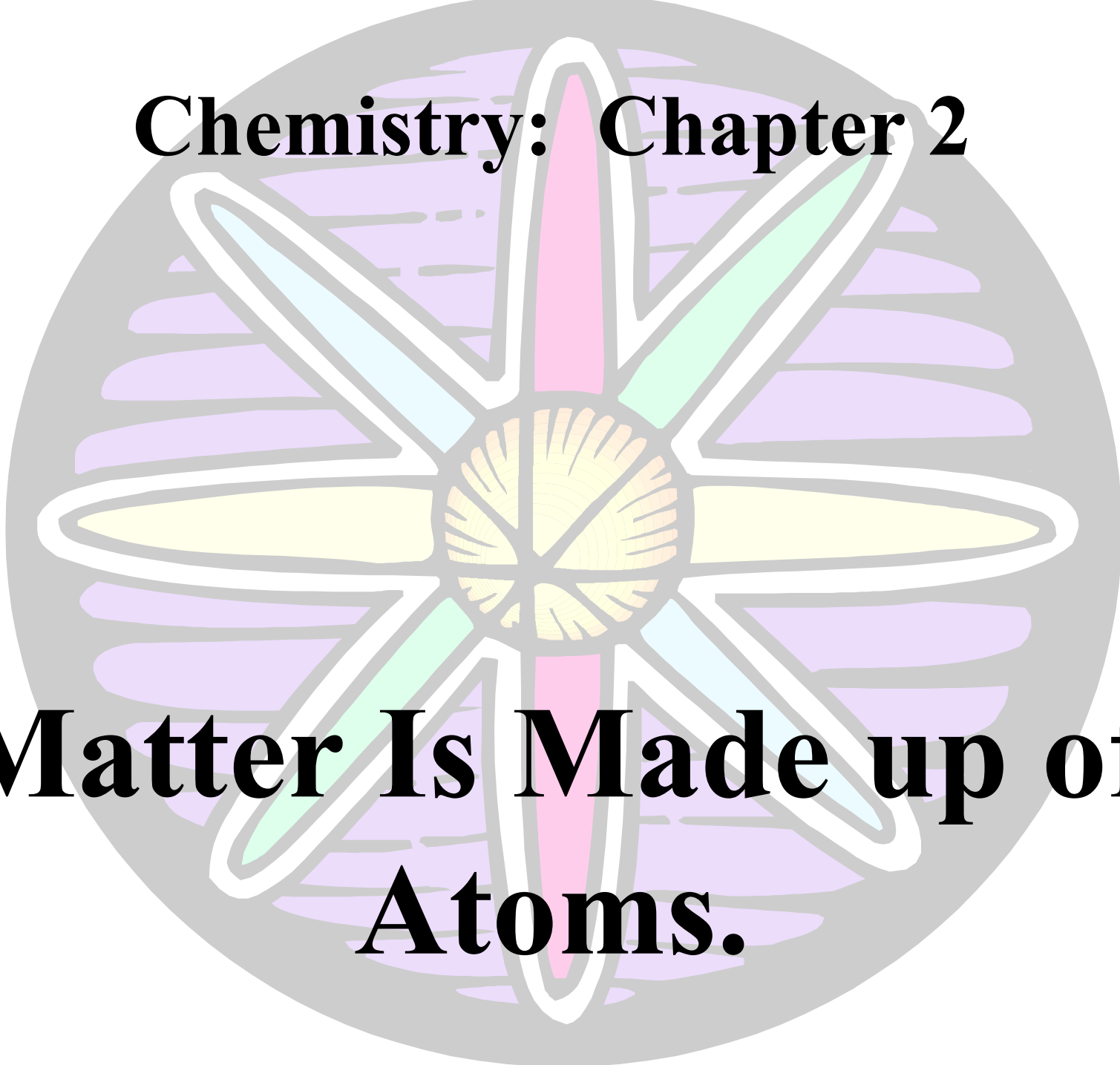


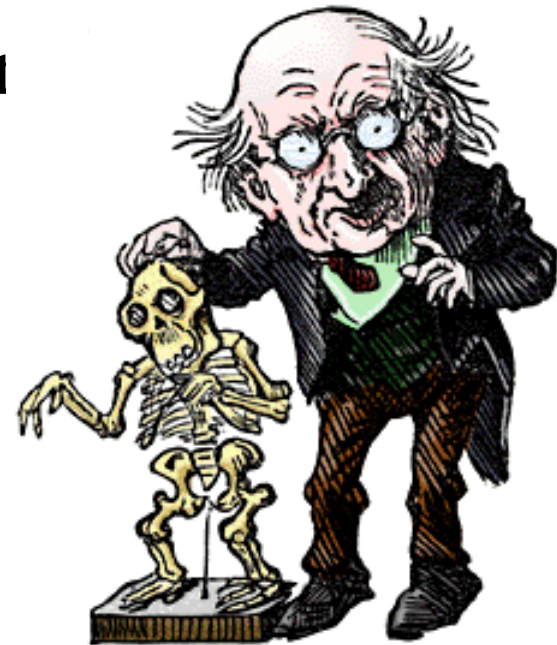
# **Chemistry: Chapter 2**

**Matter Is Made up of  
Atoms.**



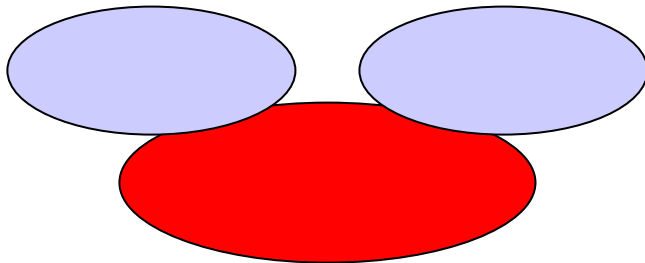
# Early Ideas

- Greeks: all things are made out of 4 elements: Earth, Water, Fire, and Air
- Democritus (~400 BC): world is made up of empty space and tiny particles called atoms.
- 1780's Lavoisier: Law of Conservation of Matter....which is?



# More Discovery...

- In 1799, Joseph Proust discovered that elements that composed compounds were always in a certain proportion by mass:
- Law of definite proportions.



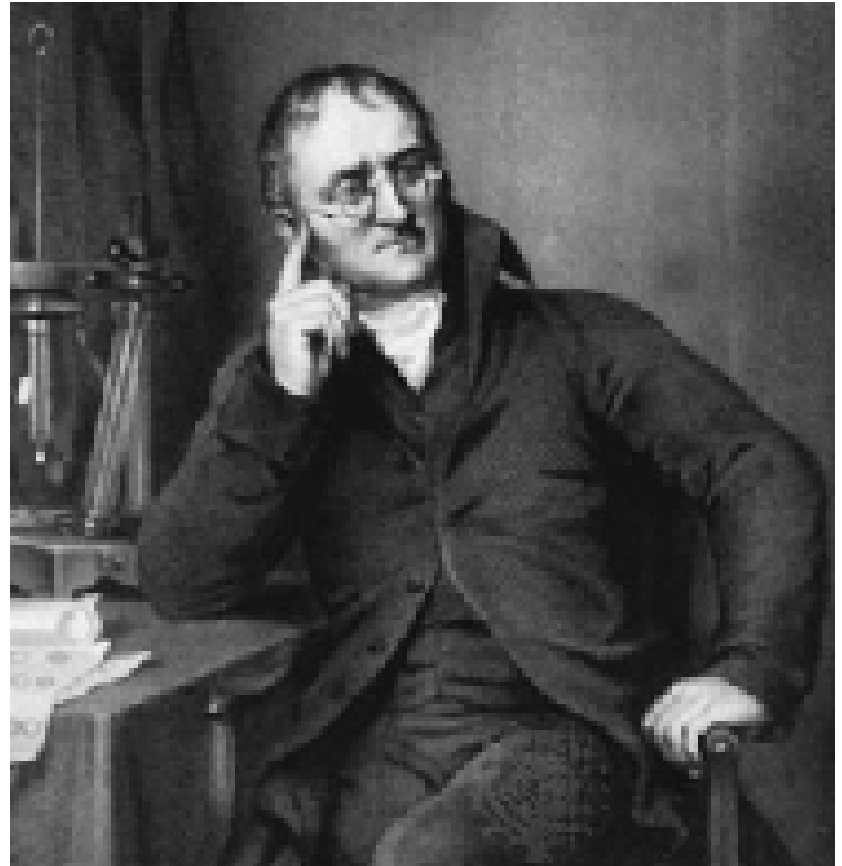
Water is 11% Hydrogen  
89% Oxygen, by mass.

# Then Came Dalton

- John Dalton (1766-1844)
- **Dalton's Atomic Theory:**
  1. All matter is made up of atoms
  2. Atoms are indestructible and cannot be divided into smaller particles.
  3. All atoms of one element are alike, but they are different from atoms of other elements.

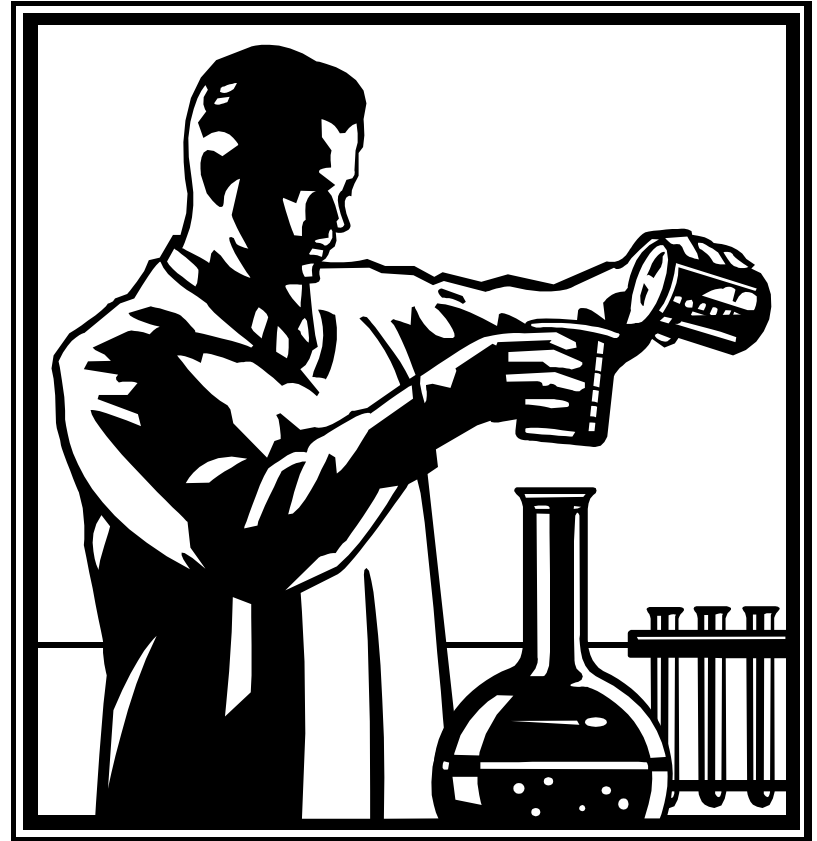
# Questions From Dalton.

- What made all of these different elements... different from one another?
- Why are there so many elements?



# There Must Be More...

- Atomic theory experiments in the late 19<sup>th</sup> century started to suggest that atoms are indeed made up of smaller particles!
- Possibly an explanation to the difference in elements.



# So What Happens If Dalton's Atomic Theory Is Wrong

- Remember the scientific method...
- A hypothesis is the first step...
- If it is repeatedly tested and supported, then it can become a theory...
- However, a theory is also continually tested to see if it needs to be changed.

# A Scientific Law Is Something Different...

- A scientific law is simply a fact of nature...
- It does not explain anything.
- In fact theories are made to explain laws!
- So...a theory will never “become” a law.

