Introduction to Chemistry

Definition of Chemistry:

- Chemistry is the study of the composition, structure, and properties of matter, the processes that matter undergoes, and the energy changes that accompany these processes

Chemistry is…

- A natural science
- A language with its own vocabulary
- A way of thinking and problem solving
- Interesting and relevant to the real world!

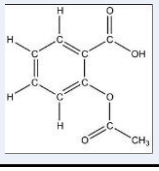
Chemical Research

- Pure or Basic Research: collects data for the sake of knowledge
- Applied Research: collects data with the purpose of solving a problem
  - -Example: developing a new drug
- Theoretical Research: using math or computers to model or predict chemical behavior or properties
- Chemistry research can lead to new technologies that enrich our lives.

5 Main Areas of Study in Chemistry

Organic Chemistry

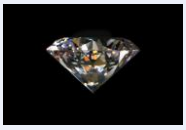
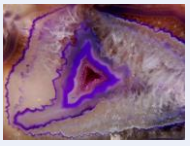
- Organic Chemistry is the study of compounds that contain the elements carbon and hydrogen.
  - –Examples: Petroleum, Plastics, Medicine, Food



The molecular formula of aspirin

Inorganic Chemistry

- The study of compounds that are not carbon based
  - –Most of what is not alive falls under this category
  - –Examples: Gems and metallic minerals

Physical Chemistry

- Chemistry that relies on a lot of physics and math to study the changes in energy that happen to matter.
  - -Examples: Lasers, how a combustion engine works

Analytical Chemistry

- Branch of chemistry that studies which substances are present in a sample (*qualitative analysis*) and how much is there (*quantitative analysis*).
  - -Examples: Forensic science, nutritional analysis, water quality testing

Biochemistry

- The study of chemical processes in living organisms
  - –Examples: Digestion, photosynthesis, cancer