Zumdahl | Zumdahl | DeCoste

World of CHEMISTRY

Chapter 1

Chemistry: An Introduction

Objectives:

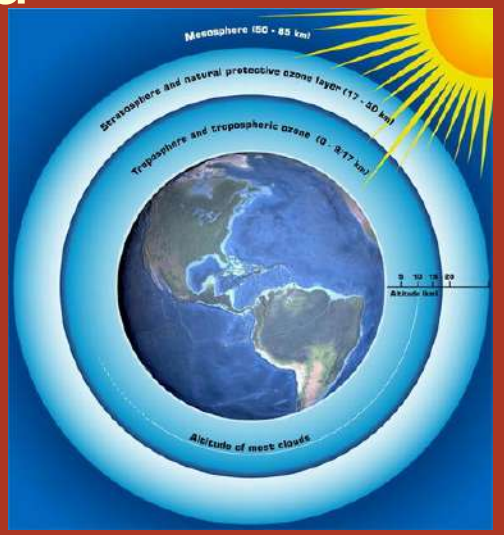
- Understand the importance of learning Chemistry
- Define Chemistry
- Recognize the general steps scientists use in solving problems
- Illustrate the scientific method
- Develop successful strategies for learning Chemistry

Why is it important to learn Chemistry?

- Used Chemistry to find out why dinosaurs disappeared
- Used by doctors, lawyers, mechanics, business people, firefighters, and poets
- Produce new materials to make our lives safer and easier
- Produce new forms of energy that are abundant and non-polluting
- Understand and control diseases that threaten us and our food supply
- Everyone's life is greatly influenced by Chemistry

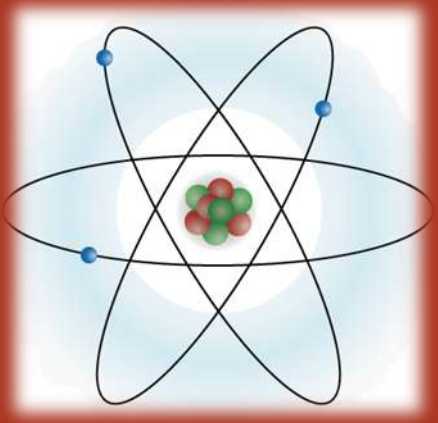
Real World Chemistry

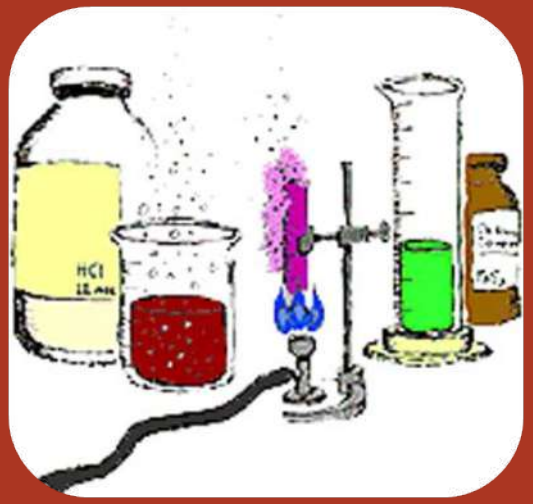
- Environmental chemistry: involves studying environmental ills and finding ways to address them
- Chlorofluorocarbons (CFC's)
  - Freon-12 hailed as near miracle substance
    - Non-corrosive
    - Unusual ability to resist decomposition
    - Excellent for refrigeration & air-conditioning
  - Decomposed ozone in upper atmosphere



What is Chemistry?

- Defined as the science that deals with the materials of the universe and the changes that these materials undergo
- Central science – most phenomena involve chemical changes
- Microscopic world of molecules and atoms

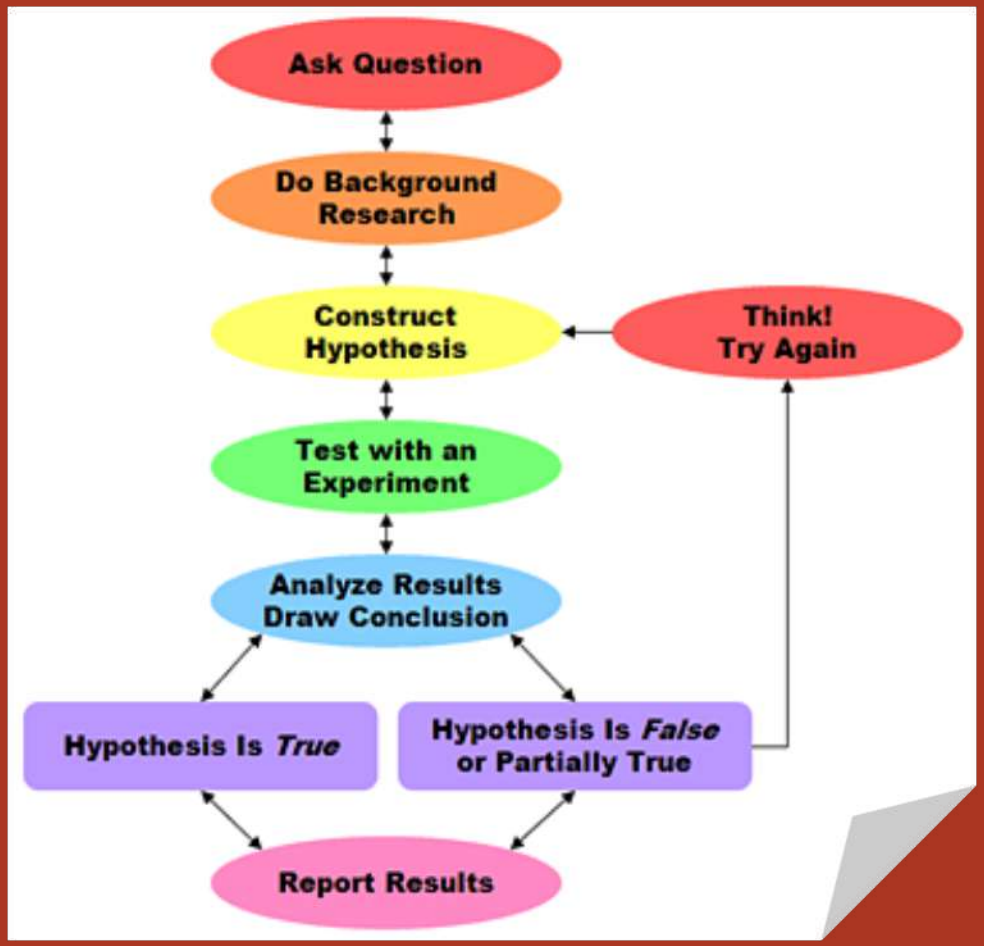




Solving Problems Using a Scientific Approach

- Making an ***observation*** – recognize the problem and state it clearly
- Formulating a ***hypothesis*** – propose possible solutions to problem / possible explanations for the observations
- Performing an ***experiment*** – seek information

The Scientific Method



A hypothesis is a possible explanation and may be incorrect.

1. True
2. False

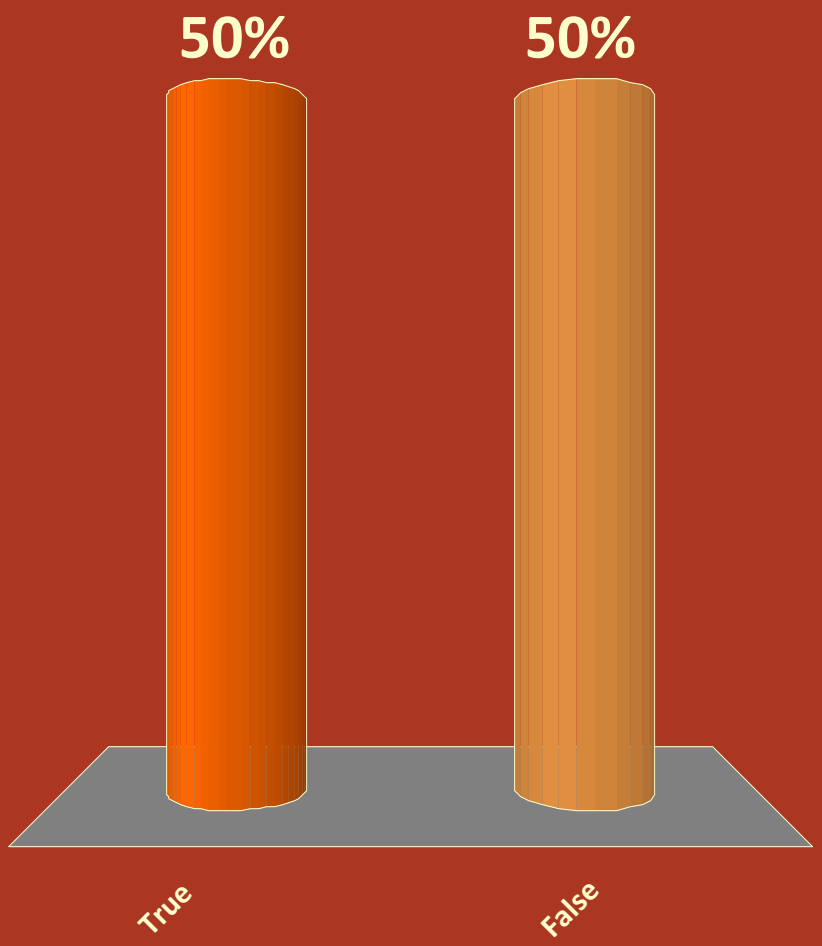
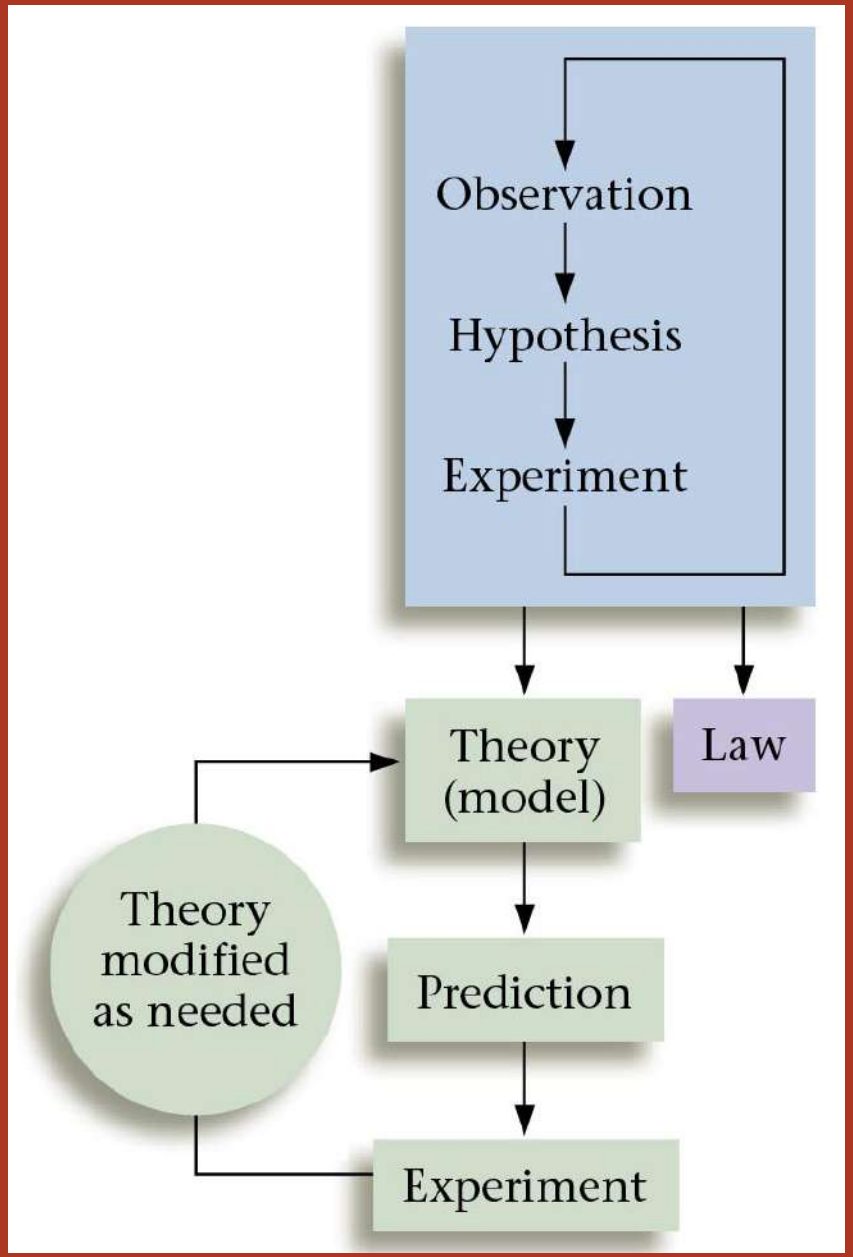


Figure1.1: The various parts of the scientific method.

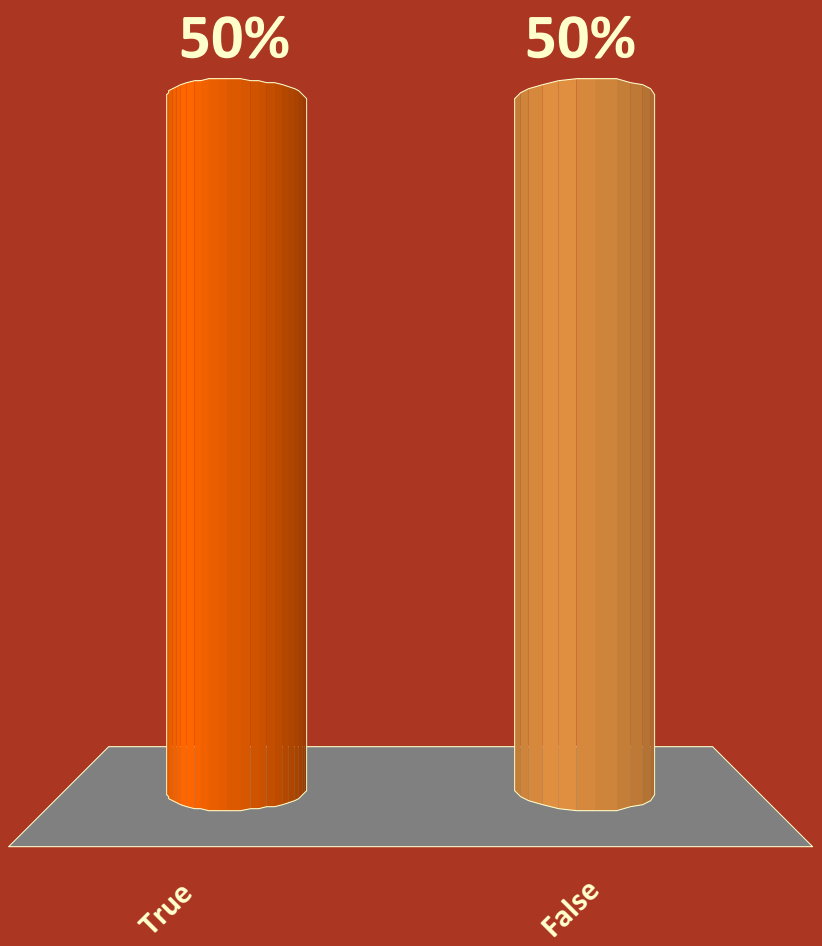


The Scientific Method

- Once hypotheses agree with observations, assemble into a theory (or model)
- A ***theory*** is a set of tested hypotheses that gives an overall explanation of some part of nature
  - Interpretation: usually changes
  - Our attempt to explain what happens
  - Once formed – still test using experiments
- ***Law*** tells what happens – summary of observed behaviour – not always applies ideally, human factor interferes

A theory and a law are the same.

1. True
2. False



Learning Chemistry

- Interesting and important
- Learn principles of Chemistry & become a better problem solver
- Do not get frustrated – learn from mistakes (Chemistry is a trial and error science)
- We will use many methods to learn: group work, experiments, reading, projects, etc.
- Participate in class, come with a good attitude, do your work, & be prepared!

Chemistry…