

- I. What is science – process of discovery, way of thinking about the world around us
- II. The Scientific Method – process by which scientist answer questions
 - A. Observation – Evidence that can be measured or observed.
 - B. Hypothesis – Formation of an explanation of the observation. An untested idea (See Figure 1.4).
 1. Inductive Reasoning – scientists draw general conclusions from specific observations
 2. Deductive Reasoning – scientists draw specific conclusions from general principles or observations
 - C. Hypothesis Testing – Designing an experiment that supports your hypothesis.
 - D. Theory –
 1. well-supported explanation withstanding tests by numerous investigators
 2. Elevated hypothesis
 3. Generally accepted by the scientific community
 - E. Law –
 1. Universally accepted theory
 2. No deviations have ever been observed.
 3. Most certain concept in science
- III. Earth System Science
 - A. The Earth can be divided into individual parts (systems) to be studied, but it is recognized that each part interacts with many other parts.
 - B. Earth's Major Systems - the 4 spheres
 1. Hydrosphere
 - a. Total Mass of Water
 - b. Covers 71% of Earth's surface
 - c. 98% is in the oceans
 - d. 2% is in streams, lakes, groundwater, & glaciers
 - e. In constant motion – Hydrologic Cycle
 - f. Needed for life to evolve and flourish
 2. The Biosphere
 - a. Includes all life
 - a1 Plants
 - a2 Animals
 - a3 Microorganisms
 - b. Continually in flux
 - b1 Temperature
 - b2 Pressure
 - b3 Chemistry
 3. Atmosphere
 - a. Envelope of gas around Earth
 - b. Essential for life
 - c. Influences weather and climate patterns
 - d. Composition Unique
 - d1 78% nitrogen
 - d2 21% oxygen

- d3 trace amounts of water vapor, carbon dioxide, and other gases
 - a. 1st atmosphere was carbon dioxide and water vapor
 - b. Oxygen added as a by-product of volcanism and photosynthesis once plants evolved
- 4. Lithosphere
 - a. The Solid Earth
 - b. Minerals and rocks
 - c. The stresses acting on the materials
 - d. Plate Tectonics