



The Nature Of Science

Earth Science
Lancaster High School
Mr. Hayhurst




Earth Science

- There are four main areas in Earth Science.
 - **Astronomy** is the study of objects beyond Earth's Atmosphere
 - **Meteorology** is the branch of Earth Science that deals with Earth's atmosphere.
 - **Geology** is the study of the materials that make up the Earth and the process that form and change these materials
 - **Oceanography** is the study of Earth's oceans




Earth's Main Systems

- Earth can be divided into four main systems:
 - The **lithosphere** includes the rocks that make up the crust and rigid, upper mantle
 - The **atmosphere** is the blanket of gasses that surrounds Earth
 - Earth's **hydrosphere** is the system of all the water on the planet.
 - The **biosphere** is Earth's inhabitants and their environments




Earth's Dynamics

- All of Earth's systems interact.
- You are part of the **biosphere** and you live on the crust which is part of the **lithosphere**.
- You breathe the gasses in the **atmosphere** and depend in many ways on the water in the **hydrosphere**.



Methods of Science

- The order of steps in a **scientific method** can vary.
- Most have the following steps:
 - Defining the problem
 - Stating a hypothesis
 - Testing the hypothesis (experiment)
 - Analyzing the results of the test
 - Drawing conclusions



Factors of the Experiment

- **Variables** are things that can change in an experiment
- A **dependent variable** changes in response to the **independent variable**
- A **control** is the standard used for comparison

Measurements in Science

- The **metric system** was developed as an international system of units.
- This system is better known as “**Le Systèm International d’ Unitès**” and abbreviated as the **SI** system.
- Basic units used in **SI** include the liter, the meter, the second, the kilogram, the Newton and degrees Celsius.

Scientific Notation

- Instead of writing out the whole number scientists abbreviate by using scientific notation.
- In **scientific notation**, a number is expressed as a multiplier and a power of 10.
- Example: 12,300 can be expressed as 1.23×10^4
- This is helpful with very large numbers.

Scientific Theory

- A **scientific theory** is an explanation based on many observations during repeated experiments.
- A **scientific theory** is valid only if it is consistent with observations, makes predictions that can be tested and is the simplest explanation of observations.
- A theory can be changed or modified if it is found to be incorrect.

Scientific Law

- A **scientific law** is a basic fact that describes the behavior of a natural phenomenon.
- A **scientific law** can be thought of as a “rule of nature,” even though the cause of the law may not be known.

The Nature Of Science

The End

Copyright © 2003, Pal Hayhurst
Lancaster High School