Science in Civilization: Exam 1

CHAPTER 1: What is Science?

Properties - qualities or attributes characteristic of an object.
Referents - comparative properties in other, more familiar objects (ex: "sky blue," "lemon yellow")
Problem - language can be subjective

Measurement - uses quantitative referents "units"
Three Steps:

1. Comparing the referent unit to the property being described.
2. Following a procedure specifying how the comparison is done
3. Counting how many standard units describe the property under consideration

Metric System

Volume	L *x* W *x* H
Time	Second (s)
Energy	Calories (cal)
Area	L *x* W
Electric Current	Ampere (amp)
Luminosity	Candela (cd)
Temperature	Kelvin (K)
Mass	Kilograms (kg)
Length	Mass (m)
Amount of Substance	Mole (mol)

Density Ratio: p = m/v

Hypothesis - a preliminary explanation for some observation
Controlled Experiment - comparing two situations with all factors alike except one

Pseudoscience - misleading and often absurd claims of scientific results.

Laws

- accepted and seemed to be true statements or ideas

Chapter 2: Motion

A net force is required for any change in a state of motion

Motion

Three basic concepts

1. position
2. speed and velocity
3. acceleration

Applications

- horizontal motion on land
- falling objects
- compound (2D) motion

Basic Ideas

- forces
- inertia and mass
- Newton's laws

Applications

- momentum and impulse
- circular motion
- Newton's law of gravitation

Two fundamental components:

- change in position
- change in time

Three important combinations of length and time:

1. Speed
2. Velocity
3. Acceleration

Speed

- change in position with respect to time
- speed = distance / time

Velocity

- describes speed and direction

Acceleration - rate at which motion changes over time; speed & direction can change. Change in velocity (speed of direction)

Isaac Newton

- all objects fall at the same rate
- no force required for uniform horizontal motion

Fundamental Forces

1) Gravity
2) Electromagnetism
3) Weak Nuclear Forces
4) Strong Nuclear Forces