

Physics
Chapter 1:
The Science of Physics

Section 1.1:
What is Physics?

What is Physics?

Physics is:

- The study of the physical world.
- The study of energy and its effects.

--Examples:

- a bouncing ball (mechanics)

- a moving car (mechanics)

- the picture and sound from a TV
(waves and optics)

- the melting of ice (thermodynamics)

- an electric motor (electromagnetism)
- particle accelerators (relativity)
- the structure of the atom
(quantum mechanics)

Areas of Physics

Name	Subjects	Examples
Mechanics	motion and its causes, interactions between objects	falling objects, friction, weight, spinning objects
Thermodynamics	heat and temperature	melting and freezing processes, engines, refrigerators
Vibrations and wave phenomena	specific types of repetitive motions	springs, pendulums, sound
Optics	light	mirrors, lenses, color, astronomy
Electromagnetism	electricity, magnetism, and light	electrical charge, circuitry, permanent magnets, electromagnets
Relativity	particles moving at any speed, including very high speeds	particle collisions, particle accelerators, nuclear energy
Quantum mechanics	behavior of submicroscopic particles	the atom and its parts

The Scientific Method

The Scientific Method is an organized system used to solve problems and gather information.

The steps of the scientific method are:

1. Make observations and collect data that lead to a question.
2. Formulate and objectively test hypothesis by experiments.

3. Interpret results and revise the hypothesis if necessary.
4. State conclusions in a form that can be evaluated by others.

- A hypothesis is a proposed explanation for some observed behavior.
- An experiment is used to test the hypothesis; the hypothesis must be tested many times to show that it is valid.
- An experiment must be controlled, with a control and set of independent variables and dependent variables.

- A hypothesis that has been tested and proven to be true becomes a theory, an accepted explanation for some behavior.
(Example: Atomic Theory)
- The term scientific law is used to describe behavior or conclusions about which there is little doubt or is an observable fact.
(Example: Law of Gravity)

Terms:

--hypothesis

--model

--system

--theory

--controlled experiment

--scientific law

--Write the definitions of these terms in your notebook/journal.