

PHYSICS

CLASS NOTES FOR CBSE

Chapter 02. Physical World

- The Word science originates from the Latin verb 'scientia' meaning "to know"
- The Sanskrit word 'Vijnan' and Arabic word 'Ilm' convey similar meaning namely 'knowledge'.

01. Scientific Method

A systematic attempt to understand natural phenomena in as much detail and depth as possible and use the knowledge so gained to predict, modify and control phenomena.

The scientific method involves several inter connected steps :-

- (i) Systematic observations
- (ii) Controlled experiments
- (iii) Qualitative and quantitative reasoning
- (iv) Mathematical modelling
- (v) Prediction and
- (vi) Verification or falsification of theories

Physics comes from a Greek word "Fusis" meaning nature.

02. Scope and Excitement of Physics

- (i) **Macroscopic** : Macroscopic domain includes phenomena at the laboratory, terrestrial and astronomical scales. These phenomenon are studied in "classical Physics" which includes mechanics, thermodynamics optics and electrodynamics
- (ii) **Microscopic** : The microscopic domain includes atomic, molecular and nuclear phenomena. These phenomena are governed by "Quantum Physics"

IMPORTANT POINTS

- Range of length $\rightarrow 10^{-14}\text{m}$ to 10^{26}m
- Range of mass $\rightarrow 10^{-30}\text{ kg}$ to 10^{55} kg
- Range of time $\rightarrow 10^{-22}\text{ s}$ to 10^{18} s
- Terrestrial phenomena lie somewhere in two middle of the above range.



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Excitement

The basic laws are simple and universal. It is a source of wonder that such vast realms of experience can be summarized in a single sentence or equation. Einstein put it well when he remarked that

“The most incomprehensible thing about the universe is that it is comprehensible”

“No number of experiment can prove me right, a single experiment can prove me wrong”

Some physicist from different countries of the world and their major contributions

<i>Name</i>	<i>Major contribution/discovery</i>	<i>Country of Origin</i>
Archimedes	Principle of buoyancy, Principle of the lever	Greece
Galileo Galilei	Law of inertia	Italy
Christian Huygens	Wave theory of light	Holland
Isaac Newton	Universal law of gravitation, Laws of motion, Reflecting telescope	U.K.
Michael Faraday	Laws of electromagnetic induction	U.K.
James Clerk Maxwell	Electromagnetic theory, Light an electromagnetic wave	U.K.
Heinrich Rudolf Hertz	Generation of electromagnetic waves	Germany
J.C. Bose	Ultra short radio waves	India
W. K. Roentgen	X-rays	Germany
J.J. Thomson	Electron	U.K.
Maric Sklodowska Curie	Discovery of radium and polonium, Studies on natural radioactivity	Poland
Albert Einstein	Explanation of photoelectric effect: Theory of relativity	Germany



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