

Physical World Class 11 Notes

What is Science?

Physical world describes that you can think of Science as the methodical endeavour of comprehending phenomena that occurs naturally around us. Since our surroundings are governed by different laws of nature, the knowledge gained in the process is utilized for predicting, correcting, and controlling these phenomena. In simpler terms, the objective of Science is to examine, test, and predict these phenomena around us.

Physical World and the Scientific Method

In order to bring requisite changes to our surroundings, it is important to understand the way it works. This is done through Scientific methods which include several interrelated steps such as systematic observations, structured experiments, qualitative and quantitative reasoning, mathematical modelling, prediction, validation, or false theory.

What is Physics?

An important component of the physical world, Physics can be broadly explained as an exploration of the basic laws of nature and their appearance in various natural phenomena. In physics, we try to explain different physical phenomena in terms of certain concepts and laws. An effort has been made to see the material world as an expression of several natural laws in various fields and situations. For example, the Law of Gravity (introduced by Newton) describes falling apples on the earth, lunar orbital motions, and planetary orbital motions. Similarly, the Basic Laws of Electromagnetism (Maxwell's equations) govern all electrical and magnetic phenomena.

Classical Physics

Out of the many branches of Physics, Classical Physics is concerned with the study of the phenomenon which occurs at the macroscopic level. It includes topics such as electrodynamics, mechanics, thermodynamics, and optics. Classical along with Modern Physics form an integral part of the physical world.

Physical World, Technology and Society

Technology and physics are inter-related. At times, technology gives rise to new concepts in Physics, whereas at other times, theories of physics are utilized to create new technologies. Sometimes technology leads to the emergence of new theories in

physics. An example of this is wireless communication technology after the discovery of the basic laws of electricity and magnetism in the 19th century.

Important Terminologies

Now that you have understood the various facets of Physics, let us understand some of the important terms which are used very often to describe events in the physical world.

Force	In the physical world, there are four basic forces of nature that dominate the microscopic world and its various phenomena. These are “gravity”, “electromagnetic force”, “strong nuclear power”, “and weak nuclear power”.
Gravity	Gravity is an attractive force that pulls objects towards itself. This happens due to the mass between two objects.
Electromagnetic Force	Be it at stationery or moving potion, The electromagnetic force is the force between charged particles.
Strong Nuclear Force	Strong nuclear forces link protons and neutrons to the nucleus. It is clear that in the absence of an attractive force, the nucleus will become unstable due to electrical rejection between the protons. This pull is not attractive because gravity is negligible compared to electric power. Therefore, new fundamental forces must be exercised.

Weak Nuclear Force

You can observe the play of weak nuclear forces in phenomena like nuclear fission. When the β dissolves, the nuclei emit uncharged electrons and particles known as the neutrino. Weak nuclear forces are not as weak as gravity, but much weaker than strong nuclear or electromagnetic forces. The range of weak nuclear forces is very small.

Conservation Laws

In the physical world, the physical quantities which cannot be changed are called conserved quantities. This phenomenon is explained via laws of conservation like conservation of mass, linear momentum, energy, charge, angular momentum, parity, etc.

Important Questions Related to Physical World

Now that you have understood the basic terms as well as the important phenomenons, here are some questions related to the Physical World for you to solve.

1. Elucidate the difference between Technology and Science.
2. What do you understand by Nuclear Force?
3. State some differences between Strong and Weak Nuclear Force.
4. Cite some examples to explain the role of Physics in our day-to-day life.
5. Briefly explain Quantum Physics.
6. Which are the fundamental forces that exist in nature?