

Fundamental Ideas in Physics

1. Matter and Energy

Matter and energy are two of the most important concepts in physics. This is because these quantities are so basic to the structure and nature of the universe. Although each of these quantities has precise meanings in physics, there is a close and important relationship between them.

2. Cause and Effect

The relationship between cause and effect is fundamental in nature and its condition is observed in almost every aspect of physical phenomena throughout the universe. Cause and effect is constantly occurring in physical systems and for physicists is an important and essential concept in recognizing and describing nature.

3. Nature/The Universe is Mechanistic

Regarding nature as being mechanistic is another important idea in physics.

By closely observing nature, physicists have shown that the universe is mechanistic. Another words, nature behaves like a machine. Like a machine, nature is composed of elements and parts that have structure and work together in certain and predictable ways.

4. Consistency in the Universe

Another fundamental idea that physicists accept is that the laws that govern the behavior of nature are the same everywhere in the universe. This means that the laws we have found that describe what happens in this part of the universe are consistent; describing what happens in every part of the universe.

5. Physical Laws and Theories

Physics is concerned with describing the structure and behavior of nature at its most basic and fundamental level. What we know and can predict about this structure and behavior is written in terms of physical laws and theories. These laws and theories are the basis of knowledge in physics as a science.

6. Size and Scale

Another important idea in physics is the concept of size and scale. Physicists recognize that the universe has a range of size and scale and that it is essential that we can identify and distinguish size and scale in the universe. This range covers sizes and scales from the most minute subatomic particles all the way to most expansive and enormous size of space. And it includes everything in between.

7. Conservation Laws

An extremely important concept in physics is the one involving conservation.

Physicists have found that there are certain physical quantities in nature whose amount never changes. Energy is an example of one of these quantities.

In other words, these quantities are never created or destroyed; thus they are said to be ones that are conserved. The conservation laws state the nature of the unchanging nature of these quantities.