

What does physical quantity mean

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A physical quantity in physics is a quantity which can be defined and measured. For example, mass, length, volume of an object, speed of moving car, distance, force, time, current, etc. are the examples of physical quantities. We describe the laws of physics in the terms of these physical quantities.

Fundamental quantities are those physical quantities that do not depend on any other physical quantity for their measurement. Mass, length, time, electric current, luminous intensity, temperature, and amount of substance are the examples of base or fundamental physical quantities in physics.

In addition to these seven fundamental physical quantities, there are two more physical quantities known as supplementary quantities. These quantities are solid angle and plane angle.

Derived quantities are those physical quantities that are derived from the fundamental physical quantities. In other words, a physical quantity which is derived or obtained by multiplying or dividing one base physical quantity with another base physical quantity is called derived quantity.

For example, area, volume, density, force, velocity, acceleration, linear momentum, etc. All the physical quantities other than seven fundamental or base quantities are derived quantities in physics.

Measurement is a process of comparing of an unknown physical quantity with a known standard quantity (or constant quantity). In order to measure any physical quantity, we need two things. They are:

So, any physical quantity has two components: magnitude (n) of the physical quantity and its unit (u). The number of times a standard unit or quantity is present in a given physical quantity is called magnitude of physical quantity. Thus,

Magnitude of physical quantity = numerical value of physical quantity * size of its unit

For example, a light travels in air at the speed of 300000 km/s. It means that the magnitude of physical quantity of 'speed of light' is 300000 and its unit is km/s.

Let's take another simple example. If we measure the length of a rod, we will use a metre-scale as a standard. On measurement, if we find that the length is 5 times the standard metre scale, the length is 5 metres. In this statement, 5 is the magnitude of the length and metre is the unit of physical quantity. Thus, if the length of the rod is 3 m, then $Q = 3 \text{ m}$ where $n = 3$, $u = 1 \text{ m}$.

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Remember that there is no meaning of any physical quantity without a proper unit. For example, the radii of two solid spheres are 2 and 6. Then, we cannot sure that which of the two solid spheres are bigger in size? Therefore, it is difficult to estimate the size of anything without a proper unit.

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Web: <https://www.kary.com.pl/contact-us/>

Email: energystorage2000@gmail.com

WhatsApp: 8613816583346

