

Units and dimensions

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Abstract:

This article is about units and dimensions, which is the basic of measurement, so it consists in our everyday life and everyday science.

Laws of Physics are in fact relationships between major physical quantities. And the laws of Physics remains same for all observers inertial reference frame. Importance of measurement may be stated from often quoted view of Lord Kelvin.

"I often say that when you can measure what you are speaking about and Express it in numbers you know something about it but when you cannot Express it in numbers your knowledge is a meagre and unsatisfactory kind; it may be the beginning of knowledge but you have scarcely in your thought, advance to the stage of science whatever the matter may be".

All the scientists were not always remained confined only with strictly measurable concept no denying the

great importance of measurement to science. Open in the history of science small but significant discrepancies between the existing theory and accurate measurement have led to the development of the new and more general theories. Does the measurement of velocity of light in various media facilitated to establish the wave theory of light. Special theory of relativity actually a from an attempt to measure the absolute velocity of the Earth and the quantum theory emerge from the measurement of the distribution of energy in the black body spectrum. Such advances in our understanding would not have been possible is scientists were satisfied with only a qualitative explanation of the natural phenomena.

Physical quantities, Standards and units:

For the purpose of Physics and the physical quantities such as for time velocity the answer take that there must be defined clearly and precisely. The operational point of view for such definition requires a process for measuring that quantity. Operational definition of a physical quantities involves two steps.

- The choice of standard unit.
- Procedure for comparing the standard to the quantity to be measured and following this prescription measured value of any physical quantity can be expressed using same kind and the number sitting how many times unit is contained in the quantity.

Basic and derived units:

Physical quantities are often divided into two fundamental or basic and derived. Choosing a set of physical quantities as fundamental all other quantities in physics may be defined in terms of our fundamental ones. Checking length time and mass as fundamental quantities all other nikal nikal quantities such a sport star velocity acceleration what extra can be expressed in the terms of fundamental quantities. However the choice of fundamental quantities is not all unique. One May easily choose force instead of mass is a fundamental quantity having selected the fundamental quantities and determined to their units to automatically saves the units for the derived quantities.

SI units:-

Engine recently several substance of unit has been used in the field of science and engineering . The Commission of symbols, Units and Nomenclature recommended the use of only one System of units known as Si units, for using all scientific measurement all over the world. The system is being widely used all over the world since. Si units are of three kinds. The base or fundamental, supplementary and derived units.

Physical quantity	Name	Symbol
length	metre	m
mass	kilogram	kg (not kgm)
time	second	s (not sec.)
electric current	ampere	A (not amp.)
temperature	kelvin	K (not °K)
luminous intensity	candela	cd
amount of substance	mole	mol

Table 1.3-2: Supplementary SI units

Physical quantity	Name	Symbol
plane angle	radian	rad
solid angle	steradian	sr
radio-activity	curie	ci

Reference:-

General properties of matter:- DP Roychowdhary