

SYSTEMS OF UNITS

Any time we make a measurement or calculation in physics we need to express them in a given set of units. So let's begin by looking at three most common systems of units used in physics. The three basic fundamental quantities in mechanics are length, mass, and time. Let's look at the units for these quantities in different system of units.

System of Units

System	Length	Mass	Time
SI(MKS)	Meter	Kilogram	Second
cgs	Centimeter	Gram	Second
British(Engineering)	Foot	Slug	Second

1 slug = 14.6 kg

Of these 3 systems of units, the SI system is the most commonly used and it's the one that we will be using most of the time. One of the reasons it is commonly used is because of its convenience to use - it has prefixes that allow you to change units within the same base units.

Common SI Prefixes

Prefix	Symbol	Power
Giga	G	10^9
Mega	M	10^6
Kilo	K	10^3
centi	c	10^{-2}
milli	m	10^{-3}
micro	μ	10^{-6}
nano	n	10^{-9}

As an example using the meter as the base unit:

$$1\text{cm} = 10^{-2}\text{ m (100 cm} = 1\text{ m)}$$

$$1\text{ mm} = 10^{-3}\text{ m (1000mm} = 1\text{ m)}$$

$$1\text{Gm} = 10^9\text{ m}$$