

FEATURE 7 Dimensional analysis can be made in terms of SI base units

The International System of Units (SI) rests on seven base units. They are listed below, along with their symbols in brackets [].

meter	[m]	ampere	[A]	mole	[mol]
kilogram	[kg]	kelvin	[K]		
second	[s]	candela	[cd]		

It is a remarkable fact that *all* units can be expressed in terms of one or more of these base units. For example, the unit of speed (meter per second) is obviously expressed in terms of the base units [m] and [s]. In a far less obvious example, the volt [V], expressed in base units, is equal to $[\text{kg}\cdot\text{m}^2/(\text{A}\cdot\text{s}^3)]$.

Units that are not base units of the SI (such as the meter per second and the volt), are named *derived units*. The derived unit and its expression in terms of base units is prominently displayed on each chart. For example, in Figure 7, the

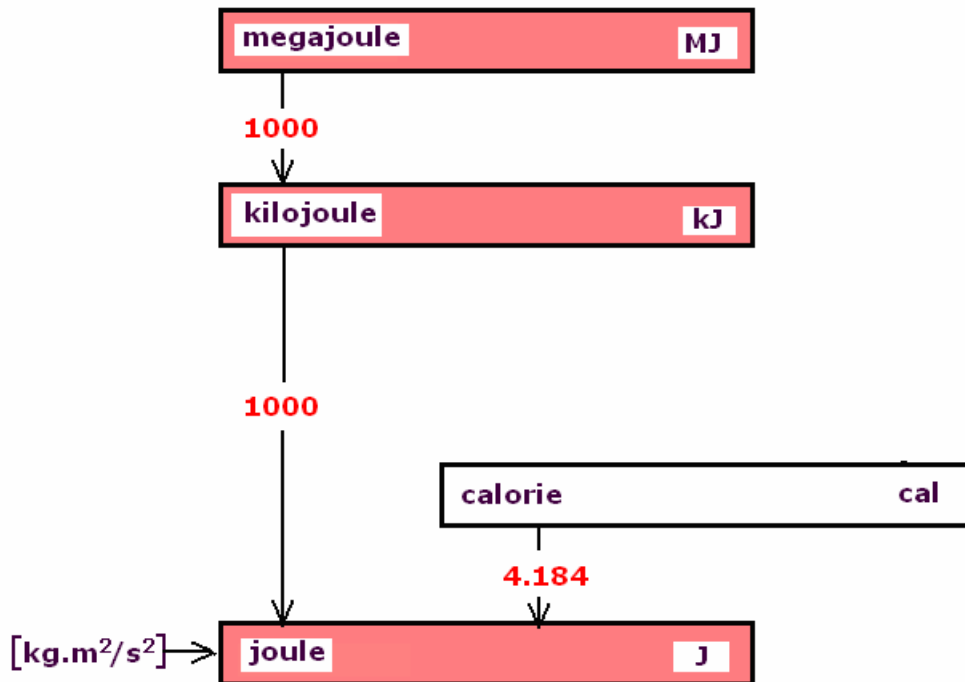


Figure 7

derived unit for ENERGY is the **joule** and its expression in terms of SI base units is $[\text{kg}\cdot\text{m}^2/\text{s}^2]$.

Engineers and scientists that wish to check their equations by performing a dimensional analysis will find this SI base-unit feature particularly useful.

Note that multiples and submultiples of SI derived units (such as multiples and submultiples of the **joule**) are all displayed in red boxes.