

Four base units of measure in the metric system about to be changed

9 November 2018, by Bob Yirka



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Officials with the General Conference on Weights and Measures (CGPM) have announced that at a meeting to be held next week, four of the base units used in the metric system will be redefined. The four units under review are the ampere, kilogram, mole and kelvin.

Currently, the [kilogram](#) is officially defined as the mass of a cylinder made of a platinum-iridium alloy housed in a bell jar in France—it has been removed from its protected spot every 40 years to serve as a calibration tool for other weights. But according to officials with CGPM, its days are numbered. This is because the 60 member nations that make up the body will be voting to change to a system in which the kilogram will be defined indirectly—by using the Planck constant.

The tool used to provide the new base unit is the Kibble balance—a very complex piece of equipment that first measures the amount of electric current necessary to create an [electromagnetic force](#) that is equal to a force acting on a given mass. It is during the second stage that the Planck constant comes into play. The reason for the changeover is to reference a more stable basis of measurement

and to allow for the development of more precise measuring devices. Several metrologists involved in bringing the changes to a vote have acknowledged that most people will neither understand the changes that have taken place, nor notice that a change has occurred.

The metric system is part of the International System of Units, and in places other than the United States, is commonly called SI. Efforts to make it more precise have been underway for years. The speed of light, for example, was updated in 1983, and is now defined as 299,792,458 meters per second.

For those interested in the proceedings, the CGPM will be streamed live on the internet. Officials have described the meeting as marking the end of SI measurements based on objects. Prior meetings have already resulted in updating the other three base units in the system: the second, meter and candela. If the measures pass, the changes will take effect in May of next year.

More information: 26th meeting of the CGPM: 13-16 November 2018: www.bipm.org/en/cgpm-2018/

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