

Weighty mission for scientists: redefine the kilo

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Researchers caution there is still some way to go before their mission is complete, but if successful it would lead to the end of the useful life of the last manufactured object on which fundamental units of measure depend.

At the moment, the international standard for the kilo -- the equivalent of around 2.2 pounds -- is a chunk of metal, under triple lock-and-key in France since 1889.

But scientists became concerned about the cylinder of platinum and iridium housed at the International Bureau of Weights and Measures (BIPM) in Sevres, near Paris, after discovering it had mysteriously lost a tiny amount of weight.

Experts at the institute revealed in 2007 that the metal chunk is 50 micrograms -- 0.0000017 ounces -- lighter than the average of several dozen copies, meaning it had lost the equivalent of a small grain of sand.

They are now searching for a non-physical way of defining the kilo, which would bring it in line with the six other base units that make up the International System of Units (SI).

The other units are the metre, the second, the ampere, the kelvin, the mole and the candela, and none of them are now based on a physical reference object.

Experiments are focused on establishing a link between mass and the Planck constant, the fundamental unit of measurement in [quantum physics](#), to provide a new definition of the kilo.

Michael Stock, a BIPM scientist who will on Monday discuss the proposed change in London, said the metal chunk, known as the "international prototype", was coming to the end of its useful life.

"Measurements get more and more precise, and precise measurements require well-defined measurement units to express their results," he said.

He added that "our experiments are moving forward, however, it is too

early to implement the new definition of the kilogram just yet."

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