Measurement Standards Laboratory of New Zealand

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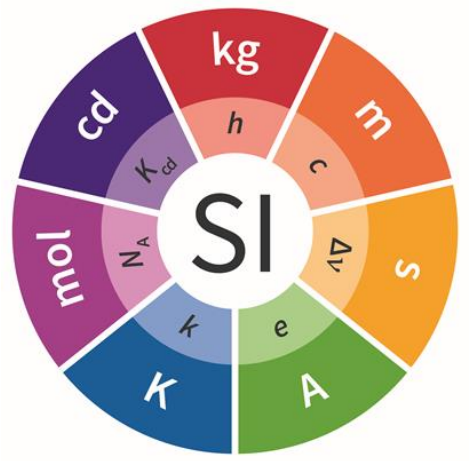
Revision of the International System of Units in 2019



The SI base units are being given simpler and more fundamental definitions.

MSL is the New Zealand home for the International System of Units.

The International System of Units, known as the SI, is the globally-agreed basis for expressing measurements at all levels of precision, and in all areas of science, technology, and human endeavour.

The SI is made up of seven base quantities that each correspond to a universally-recognised unit.

The SI will undergo a major revision in May 2019 that will be implemented by the international measurement community. This global change involves moving away from material artefacts (e.g. the kilogram prototype in Paris), and instead defining all base units in terms of a set of constants of nature.

The Measurement Standards Laboratory is the primary agency responsible for implementing the new SI redefinitions into New Zealand. Adopting the definitions will allow NZ to remain consistent with international best practice and allow precision measurement to be available to everyone.

Quantity	Unit	Symbol
Mass (papatipu)	kilogram (manokaramu)	**kg**
Length (roa)	metre (mita)	**m**
Time (wā)	second (hākona)	**s**
Electric current (iahiko)	ampere (wae-iahiko)	**A**
Thermodynamic temperature (pāmahana wera ahupūngao)	kelvin (kelvin)	**K**
Amount of substance (rahinga matū)	mole (tīwhanga)	**Mol**
Luminous intensity (kukū whakaputa tūrama)	candela (kānara)	**cd**

The changes will mark an important and historic step forward. Just as the redefinition of the second helped enable GPS navigation, the redefined SI is expected, over time, to enable new technologies we have yet to imagine, whilst maintaining continuity for practical users.

The new definitions will tie measurements at the atomic and quantum scales to those at the macroscopic level in areas such as mass and temperature, where previously the link has been made using less accurate indirect methods. This adds to the appeal of the changes.

Measurement is a field where the states and economies of the world work together. The SI provides a universal language for measurement and the proposed changes are a result of a worldwide agreement at the General Conference (CGPM) in 2018.

Four of the base units – the kilogram, ampere, kelvin, and mole – will be redefined based on fixed numerical values of the Planck constant (h), the elementary charge (e), the Boltzmann constant (k), and the Avogadro constant (NA), respectively. The three remaining base units – the second, metre and candela – are already defined by physical constants, so it will only be necessary to edit their present definitions.

Further information on the redefinition can be found here - https://www.measurement.govt.nz/metrology/

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