What is liter used for

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The litre (Commonwealth spelling) or liter (American spelling) (SI symbols L and l,[1] other symbol used: l) is a metric unit of volume. It is equal to 1 cubic decimetre (dm3), 1000 cubic centimetres (cm3) or 0.001 cubic metres (m3). A cubic decimetre (or litre) occupies a volume of 10 cm x 10 cm x 10 cm (see figure) and is thus equal to one-thousandth of a cubic metre.

One litre of liquid water has a mass of almost exactly one kilogram, because the kilogram was originally defined in 1795 as the mass of one cubic decimetre of water at the temperature of melting ice (0 ?C).[4] Subsequent redefinitions of the metre and kilogram mean that this relationship is no longer exact.[5]

A litre is a cubic decimetre, which is the volume of a cube 10 centimetres x 10 centimetres x 10 centimetres (1 L ? 1 dm3 ? 1000 cm3). Hence 1 L ? 0.001 m3 ? 1000 cm3; and 1 m3 (i.e. a cubic metre, which is the SI unit for volume) is exactly 1000 L.

Litres are most commonly used for items (such as fluids and solids that can be poured) which are measured by the capacity or size of their container, whereas cubic metres (and derived units) are most commonly used for items measured either by their dimensions or their displacements. The litre is often also used in some calculated measurements, such as density (kg/L), allowing an easy comparison with the density of water.

One litre of water has a mass of almost exactly one kilogram when measured at its maximal density, which occurs at about 4 ?C. It follows, therefore, that 1000th of a litre, known as one millilitre (1 mL), of water has a mass of about 1 g; 1000 litres of water has a mass of about 1000 kg (1 tonne or megagram). This relationship holds because the gram was originally defined as the mass of 1 mL of water; however, this definition was abandoned in 1799 because the density of water changes with temperature and, very slightly, with pressure.

It is now known that the density of water also depends on the isotopic ratios of the oxygen and hydrogen atoms in a particular sample. Modern measurements of Vienna Standard Mean Ocean Water, which is pure distilled water with an isotopic composition representative of the average of the world"s oceans, show that it has a density of 0.999975?0.000001 kg/L at its point of maximum density (3.984 ?C) under one standard atmosphere (101.325 kPa) of pressure.[6]

One litre is slightly larger than a US liquid quart and slightly less than an imperial quart or one US dry quart. A mnemonic for its volume relative to an imperial pint is "a litre of water"s a pint and three-quarters"; this is very close, as a litre is about 1.76 imperial pints.

Prior to 1979, the symbol l came into common use in some countries;[citation needed] for example,

it was recommended by South African Bureau of Standards publication M33 and Canada in the 1970s. This symbol can still be encountered occasionally in some English-speaking and European countries like Germany, and its use is ubiquitous in Japan and South Korea.

Fonts covering the CJK characters usually include not only the script small l but also four precomposed characters: ul, ml, dl, and kl for the microlitre, millilitre, decilitre and kilolitre to allow correct rendering for vertically written scripts. These have Unicode equivalents for compatibility, which are not recommended for use with new documents:[12]

In 1901, at the 3rd CGPM conference, the litre was redefined as the space occupied by 1 kg of pure water at the temperature of its maximum density (3.98 ?C) under a pressure of 1 atm. This made the litre equal to about 1.000028 dm3 (earlier reference works usually put it at 1.000027 dm3).

In 1964, at the 12th CGPM conference, the original definition was reverted to, and thus the litre was once again defined in exact relation to the metre, as another name for the cubic decimetre, that is, exactly 1 dm3.[5]

In 1979, at the 16th CGPM conference, the alternative symbol L (uppercase letter L) was adopted. It also expressed a preference that in the future only one of these two symbols should be retained, but in 1990 said it was still too early to do so.[11]