

# SI Measurement

The International System of Units, or SI, is the standard system of measurement used by many scientists. Using the same standards of measurement makes it easier for scientists to communicate with one another.

SI works by combining prefixes and base units. Each base unit can be used with different prefixes to define smaller and larger quantities. The table below lists common SI prefixes.

## SI Prefixes

Prefix	Abbreviation	Factor	Example
kilo-	k	1,000	kilogram, 1 kg = 1,000 g
hecto-	h	100	hectoliter, 1 hL = 100 L
deka-	da	10	dekameter, 1 dam = 10 m
		1	meter, liter
deci-	d	0.1	decigram, 1 dg = 0.1 g
centi-	c	0.01	centimeter, 1 cm = 0.01 m
milli-	m	0.001	milliliter, 1 mL = 0.001 L
micro-	$\mu$	0.000 001	micrometer, 1 $\mu$ m = 0.000 001 m

## SI Conversion Table

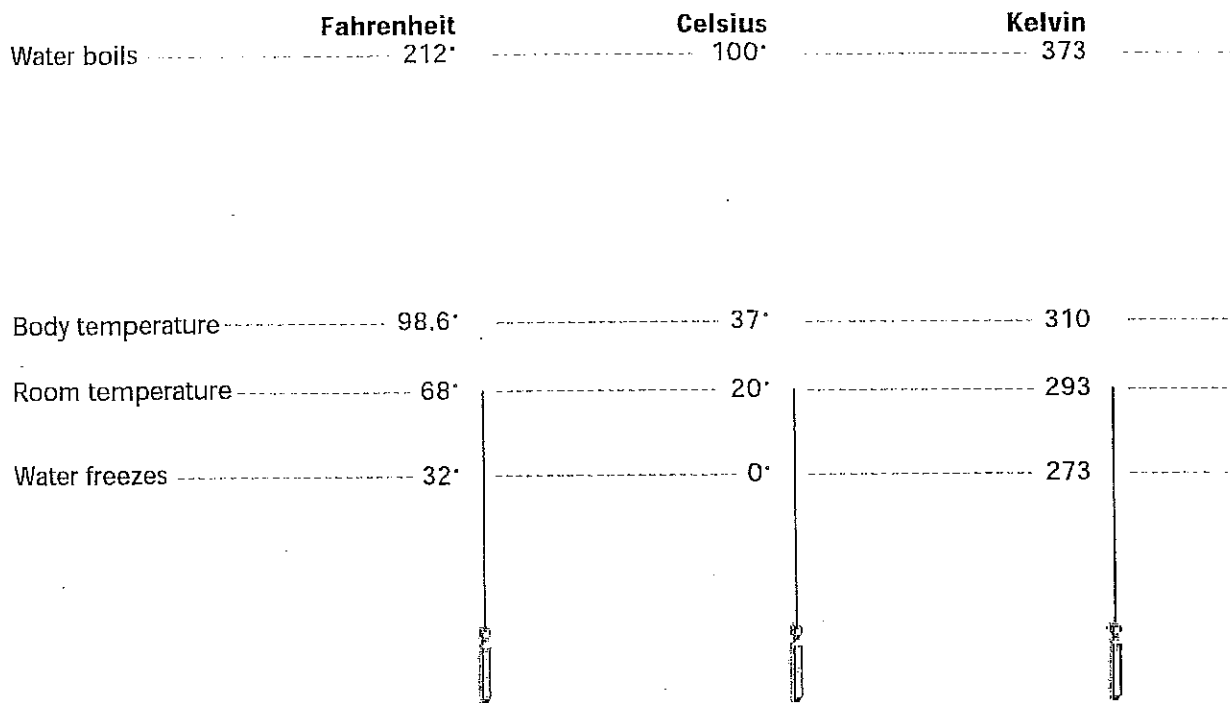
SI units	From SI to English	From English to SI
<b>Length</b>		
kilometer (km) = 1,000 m	1 km = 0.621 mi	1 mi = 1.609 km
meter (m) = 100 cm	1 m = 3.281 ft	1 ft = 0.305 m
centimeter (cm) = 0.01 m	1 cm = 0.394 in.	1 in. = 2.540 cm
millimeter (mm) = 0.001 m	1 mm = 0.039 in.	
micrometer ( $\mu$ m) = 0.000 001 m		
nanometer (nm) = 0.000 000 001 m		
<b>Area</b>		
square kilometer (km <sup>2</sup> ) = 100 hectares	1 km <sup>2</sup> = 0.386 mi <sup>2</sup>	1 mi <sup>2</sup> = 2.590 km <sup>2</sup>
hectare (ha) = 10,000 m <sup>2</sup>	1 ha = 2.471 acres	1 acre = 0.405 ha
square meter (m <sup>2</sup> ) = 10,000 cm <sup>2</sup>	1 m <sup>2</sup> = 10.765 ft <sup>2</sup>	1 ft <sup>2</sup> = 0.093 m <sup>2</sup>
square centimeter (cm <sup>2</sup> ) = 100 mm <sup>2</sup>	1 cm <sup>2</sup> = 0.155 in. <sup>2</sup>	1 in. <sup>2</sup> = 6.452 cm <sup>2</sup>
<b>Volume</b>		
liter (L) = 1,000 mL = 1 dm <sup>3</sup>	1 L = 1.057 fl qt	1 fl qt = 0.946 L
milliliter (mL) = 0.001 L = 1 cm <sup>3</sup>	1 mL = 0.034 fl oz	1 fl oz = 29.575 mL
microliter ( $\mu$ L) = 0.000 001 L		
<b>Mass</b>		
kilogram (kg) = 1,000 g	1 kg = 2.205 lb	1 lb = 0.454 kg
gram (g) = 1,000 mg	1 g = 0.035 oz	1 oz = 28.349 g
milligram (mg) = 0.001 g		
microgram ( $\mu$ g) = 0.000 001 g		

# Temperature Scales

Temperature can be expressed using three different scales: Fahrenheit, Celsius, and Kelvin. The SI unit for temperature is the kelvin (K).

Although 0 K is much colder than 0°C, a change of 1 K is equal to a change of 1°C.

## Three Temperature Scales



## Temperature Conversions Table

To convert	Use this equation:	Example
Celsius to Fahrenheit °C → °F	$^{\circ}\text{F} = \left(\frac{9}{5} \times ^{\circ}\text{C}\right) + 32$	Convert 45°C to °F. $^{\circ}\text{F} = \left(\frac{9}{5} \times 45^{\circ}\text{C}\right) + 32 = 113^{\circ}\text{F}$
Fahrenheit to Celsius °F → °C	$^{\circ}\text{C} = \frac{5}{9} \times (^{\circ}\text{F} - 32)$	Convert 68°F to °C. $^{\circ}\text{C} = \frac{5}{9} \times (68^{\circ}\text{F} - 32) = 20^{\circ}\text{C}$
Celsius to Kelvin °C → K	$\text{K} = ^{\circ}\text{C} + 273$	Convert 45°C to K. $\text{K} = 45^{\circ}\text{C} + 273 = 318 \text{ K}$
Kelvin to Celsius K → °C	$^{\circ}\text{C} = \text{K} - 273$	Convert 32 K to °C. $^{\circ}\text{C} = 32 \text{ K} - 273 = -241^{\circ}\text{C}$