The **International System of Units (SI)** defines seven quantities and their units of measure as a basic set from which all other SI units are derived. These SI base units and their physical quantities and some commonly used SI derived units are found in Table 1 and 2. In Table 3, these are units that are NOT SI but are currently accepted for use with the SI to satisfy the needs of commercial, legal and specialist scientific interests or are important for the interpretation of older texts.

Table 1. The seven SI base quantities & their units

quantity	base unit	unit symbol
mass	kilogram	kg
length	metre	m
time, duration	second	s
electric current	ampere	A
thermodynamic temperature	kelvin	K
amount of substance	mole	mol
luminous intensity	candela	cd

Table 2. Commonly used SI derived units

quantity	derived unit	unit symbol
area	square metre	m^2
volume	cubic metre	m^3
speed	metre per second	m/s
density	kilogram per cubic metre	kg/m^3
frequency	hertz	Hz
force	newton	N
pressure	pascal	Pa
power	watt	W
temperature	degree Celsius	°C

Table 3. Some of the non-SI units accepted by SI

quantity	non-SI unit	unit symbol
area	hectare	ha
time	minute	min
	hour	h
	day	d
volume	litre	L or l
mass	tonne	t
pressure	bar	bar
plane angle	degree	°
	minute	'
	second	"

Writing SI Unit Symbols and Names, and Expressing the Values of the Quantities

- Unit symbols and unit names are printed in upright with a Roman type font and there is always a space between the number (quantity) and the unit symbol EXCEPT for plane angular units (°, ", ') which are placed immediately after the number.

Ex.

70 km	BUT NOT	70 *km*
37 °C	BUT NOT	37°C
45° angle	BUT NOT	45 ° angle

- A unit symbol is written in lower-case letter unless it is named after a person. There is an exception with the litre, L or l is accepted in order to avoid possible confusion between the number 1 and lower-case letter l.

Ex.

3 kg	BUT NOT	3 Kg or 3 KG
300 Pa	BUT NOT	300 pa
1.5 l	AND ALSO	1.5 L

- However, when writing unit names, they are always written in lower-case even if they are named after a person.

Ex.

220 volts or 220 V	BUT NOT	220 Volts
6 watts or 6 W	BUT NOT	6 w
4 kelvins or 4 K	BUT NOT	4 k

- Unit symbols are NOT abbreviations therefore they are NOT followed by a period (.) except at the end of a sentence and NOT pluralized by adding "s".

Ex.

25 kg	BUT NOT	25 kgs
70 km	BUT NOT	70 km**.**

- A prefix is part of the unit, and its symbol is placed before the unit symbol without a separator such as a dash or space. Note that prefix symbols above 10^3 (kilo) such as M (mega), G (giga) and T (tera) are always uppercase.

Ex.

2 km or 2 kilometres	BUT NOT	2 kilo-metres
5 GHz or 5 gigahertz	BUT NOT	5 gHz or 5 Gigahertz

- Unit symbols and unit names are written as it is described by the SI.

Ex.

120 km/h	BUT NOT	120 kph
8 kilograms of rice	BUT NOT	8 kilos of rice
50 cm^3	BUT NOT	50 cc
5 s	BUT NOT	5 sec
500 m^2	BUT NOT	500 sqm
1.5 L or 1.5 l	BUT NOT	1.5 ltrs

- In forming products and quotients of unit symbols, multiplication must be indicated by a space or centered dot (•) and division by a horizontal line, solidus (/) or by negative exponents. The solidus however can only be used once in a given expression.

Ex.

50 N m or 50 N•m	BUT NOT	50 N x m
3 m/s or 3 m s^{-1}	AND ALSO	$3\ \frac{m}{s}$

IMPORTANT NOTES:

- The "metre" is the SI unit for length, "meter" is also an accepted spelling but for use only in the USA. Outside the USA, the "meter" is defined as a device used to measure rather than a unit of measurement.
- Though the SI accepts some non-SI units, it does not recommend the use of other non-SI units such as the inch, foot, yard, and pounds.
- The "tonne" is exactly 1,000 kg but the "ton" is equal to 1016.047 kg.

Exercises:

If the expression is correct, place a check (✓), if incorrect, place an "x" and correct the expression.

1. _____ speed of 120 kph
2. _____ 40 degrees celsius
3. _____ 80 mts to Batangas City
4. _____ 500g of salt
5. _____ 12 ounces of soy sauce

For answers, please visit the NML website

Reference:

International Bureau of Weights and Measures (2006), *The International System of Units (SI)* (8th ed)