Scientific notation refresher

Standard notation

Standard notation is when a number is written using only numbers.
Examples:

- 65890
- 0.0000397

Scientific notation

Scientific Notation takes the form:

$$M \times 10^{n}$$

where $1 \leq M < 10$, and n = the number of decimal places to be moved

The exponent value, n, is equal to the number of decimal points moves (or "jumps") because both represent a factor of ten.
Examples:

- $10000 = 1 \times 10^{4}$
- $7354 = 7.354 \times 10^{3}$
- $482 = 4.82 \times 10^{2}$
- $0.053 = 5.3 \times 10^{-2}$
- $0.0078 = 7.8 \times 10^{-3}$
- $0.00044 = 4.4 \times 10^{-4}$

Scientists frequently deal with numbers that are both very small and very big. For example, the diameter of a living cell is microscopic, while distances in space are immense. Using Standard Notation would involve too many zeros and could lead to confusion or calculation error. Thus, representing these numbers as powers of 10 is often the best practice.

Importantly,

- a positive n indicates that the standard form is a large number
- a negative n indicates that the standard form is a small number

Sometimes, the best way to make numbers more manageable is simply to convert the units of measurement. For example, rather than describing my commute distance as approximately “30 000 metres, each way”, it would be simpler to say “30 kilometres”. However, sometimes, like when performing calculations, units have to be converted not for simplicity’s sake but because units need to agree with each other.

Scientific notation

The International System of Units (Système International d'Unités), abbreviated SI, is a practical system of units of measurement shared by the world. Here are the seven base quantities. These are foundational units in that they can NOT be simplified. For example, length consists of a one-dimensional measurement of distance, whereas, force is a derived quantity (a function of mass and distance).

Base quantity		**SI base unit**	
Name	**Symbol**	**Name**	**Symbol**
Length	*l. x. r. etc.*	Metre	m
Mass	*m*	Kilogram	kg
Time/duration	*t*	Second	s
Electric current	*I, i*	Ampere	A
Thermodynamic temperature	*T*	Kelvin	K
Amount of substance	*n*	Mole	mol
Luminous intensity	I_v	candela	cd