

The Metric System and Scientific and Engineering Notations

Prefixes

Tera-	Giga-	Mega-	Kilo-	Base Unit	Milli-	Micro-	Nano-	Pico-
(T)	(G)	(M)	(k)		(m)	(μ)	(n)	(p)
10^{12}	10^9	10^6	10^3		10^{-3}	10^{-6}	10^{-9}	10^{-12}
trillion	billion	million	thousand		thousandth	millionth	billionth	Trillionth

Base Unit: The base unit can be anything that measures volume, distance, wavelength, force, velocity, etc.

- **Scientific Notation** expresses a number as a power of 10 so that the significant digits are displayed with one digit to the left of the decimal.

Example 1: Express 36,000,000 in scientific notation.

Since the decimal point in the number is to the far right, the point needs to be moved 7 places to the left: 3.6×10^7

Example 2: Express .0000523 in scientific notation.

Since the decimal point in the number is to the far left, the point needs to be moved 5 places to the right: 5.23×10^{-5}

- **Engineering Notation** expresses a number as a power of 10 where the exponent of 10 is a multiple of 3. As a result, there may be 1, 2, or 3 significant digits to the left of the decimal place (the significant digits form a number from 1 to 999.)

Example 3: Express 36,000,000 Amps in engineering notation.

Since the significant digits must form a number from 1 to 999, the decimal point must be moved 6 digits to the left: 36×10^6 Amps
Using the prefixes above, this can also be written as 36 MegaAmps.

Example 4: Express .0000523 watts in engineering notation.

In this case, the decimal point needs to be moved to the right 6 places: 52.3×10^{-6} watts
Using the prefixes above, this can also be written as 52.3 microwatts.