

SCIENTIFIC NOTATION (STANDARD FORM)

Used to write very large and very small numbers.

Form $a \times 10^n$

$1 \leq a < 10$ ie. between 1 and 10, excluding 10

n is an INTEGER ie. ...-3,-2,-1,0,1,2,3...

Place the decimal point after the first non-zero digit.
Count the number of places the decimal point moves.

$$257000 = 2.57 \times 10^5 \quad 2 \ 5 \ 7 \ 0 \ 0 \ 0 \ .$$

negative power - small number between 0 and 1,
the point moves to the right.

$$0.0000257 = 2.57 \times 10^{-5} \quad 0 \ . \ 0 \ 0 \ 0 \ 0 \ 2 \ 5 \ 7$$

USING THE CALCULATOR

eg. 2.08×10^{-3}

2 . 0 8 $\times 10^n$ (-) 3

Examples: answers in scientific notation
 correct to 3 significant figures.

- (1) 1 milligram of hydrogen contains 2.987×10^{20} molecules.
Find the number of molecules in 5 grams.

$$\begin{aligned} & 2.987 \times 10^{20} \times 5000 && 5 \text{ g} = 5000 \text{ mg} \\ & = 1.4935 \times 10^{24} \\ & = 1.49 \times 10^{24} \text{ molecules} \end{aligned}$$

- (2) The total mass of argon in a flask is 4.15×10^{-2} grams.
The mass of one atom of argon is 6.63×10^{-23} grams.
Find the number of argon atoms in the flask.

$$\begin{aligned} & 4.15 \times 10^{-2} \div 6.63 \times 10^{-23} \\ & = 6.2594... \times 10^{20} \\ & = 6.26 \times 10^{20} \text{ atoms} \end{aligned}$$