

Scientific Notation

Writing a number in Scientific Notation is a way of representing the same number using ten raised to a power. Ten is called the base and the power is called the exponent. The exponent is either a positive or negative integer depending on the number to be written in Scientific Notation. A number written in Scientific Notation must have only **one non-zero digit** to the left of the decimal point. The integer power or exponent of ten is determined by counting the number of decimal places you have to move the decimal point in the original number to get the decimal point so that there is only **one non-zero digit** to the left of it. If you have to move the decimal point to the left to place the number in Scientific Notation, the exponent will be a positive integer. If you have to move the decimal point to the right, the exponent will be a negative integer.

Examples:

1. Write the number 40. in Scientific Notation

Solution:

We have to move the decimal point to the **left** one decimal place so that there is only one digit to the left of it. Therefore, the power of 10 is either plus 1 or minus 1. Since we are moving the decimal point to the left the sign of the exponent is positive.

Therefore, 40 written in Scientific Notation is 4.0×10^1

2. Write the number 0.000025 in Scientific Notation

Solution:

We have to move the decimal point to the **right** five decimal place to have only one non-zero digit to the left of the decimal point. Therefore, the power of 10 is either plus 5 or minus 5. Since we are moving the decimal point to the right the sign of the exponent is negative.

Therefore, 0.000025 written in Scientific Notation is 2.5×10^{-5}

3. More examples

Number	Same Number in Scientific Notation
24000.125	2.4000125×10^4
60.5	6.05×10^1
900.86	9.0086×10^2
0.9999	9.999×10^{-1}
1000000	1.0×10^6
$\frac{1}{2}$	$5. \times 10^{-1}$