



Handling Huge and Tiny Numbers

A Visual Guide to Scientific Notation in Chemistry

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The Anatomy of Scientific Notation



The Digit Term

Must be a number strictly between 1.000... and 9.999... (Only a single non-zero digit is permitted before the decimal point).

$N \times 10^n$

The Exponent

An integer defining the magnitude. It represents exactly how many places the decimal point moved.

The Base

Always 10. The constant, predictable foundation of the metric system.



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



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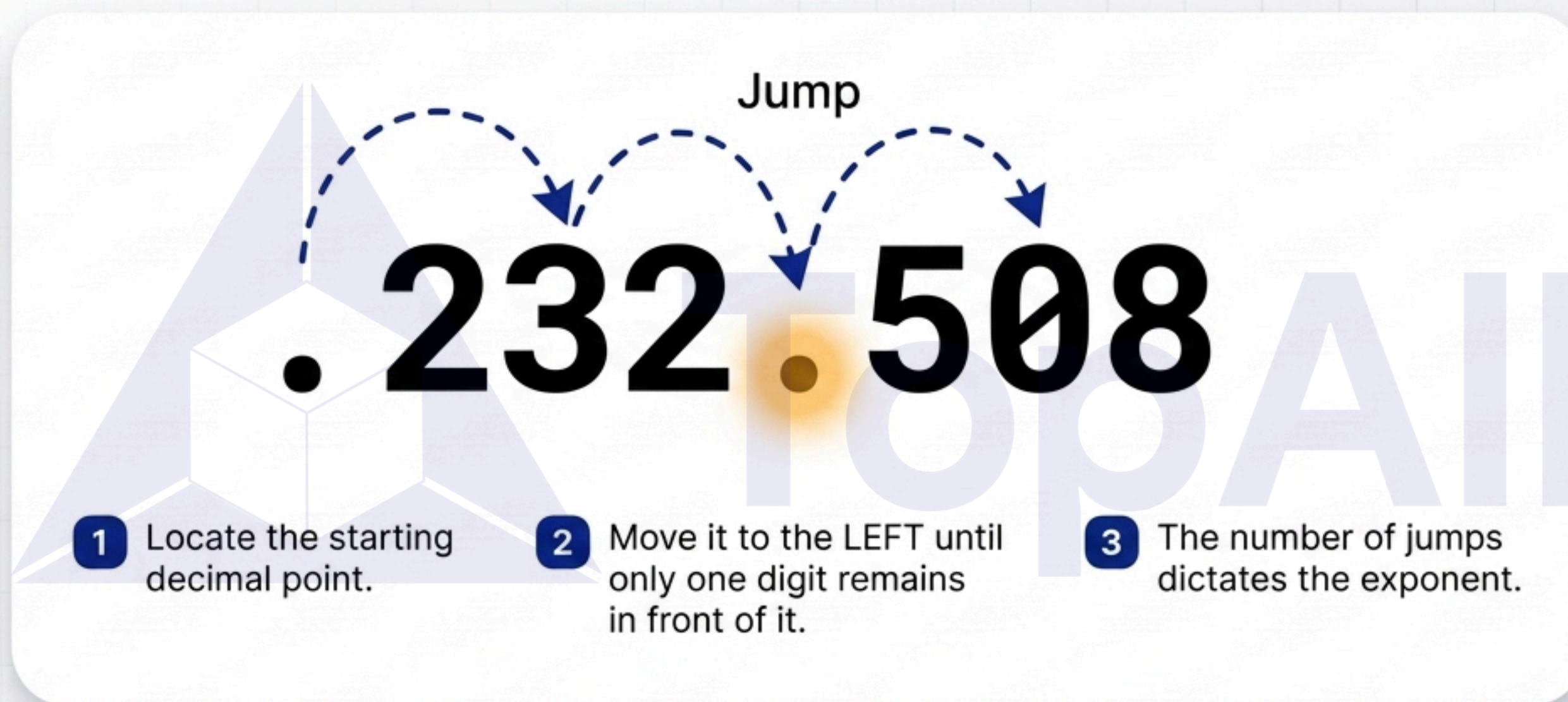
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Key Highlights

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- » Get Clear Explanations, Not Just Marks
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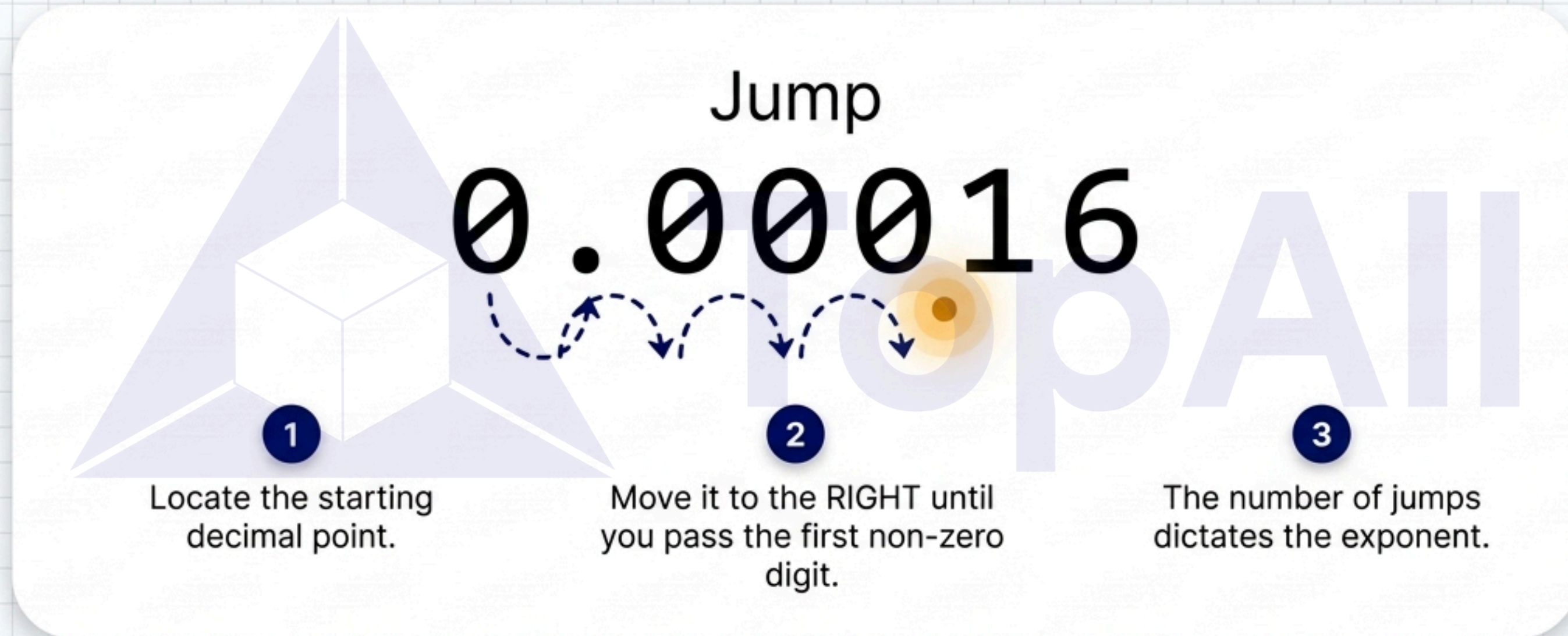
Condensing Large Numbers



2 jumps left
= positive 2

$$2.32508 \times 10^2$$

Condensing Tiny Numbers



4 jumps right
= negative 4

$$1.6 \times 10^{-4}$$

Math with Scientific Notation

Multiplication & Division

Handle coefficients (N) and exponents (n) independently.

Multiply/Divide the N values.

Add exponents for multiplication:

$$10^a \times 10^b = 10^{(a+b)}$$

Subtract exponents for division.

Addition & Subtraction

 **NEVER add coefficients if exponents are different!**

You must manipulate the numbers so their exponents (n) are identical before adding the N values.

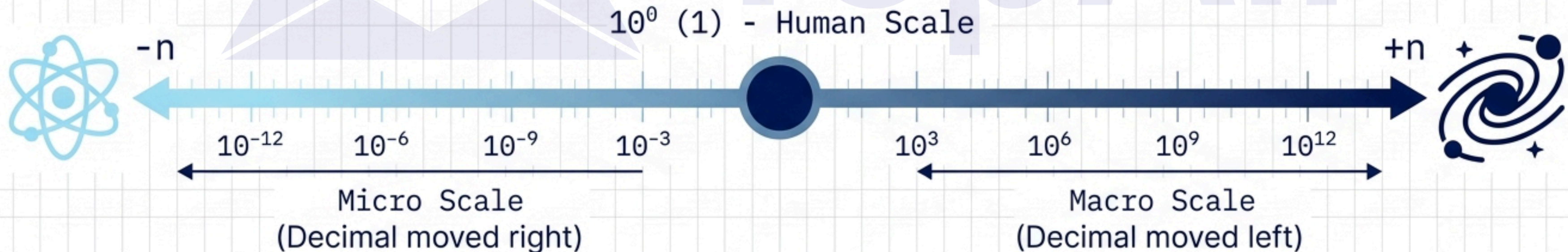
$$\begin{aligned} &6.65 \times 10^4 + 8.95 \times 10^3 \\ \rightarrow &6.65 \times 10^4 + 0.895 \times 10^4 \\ \rightarrow &(6.65 + 0.895) \times 10^4 \end{aligned}$$

The Golden Rule of Exponents

The exponent is a map to the scale of the universe.

Positive Exponent = Extremely Large Number.

Negative Exponent = Extremely Small Number.





You've Learned the Theory.

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