

Why would you use scientific notation?

Answer:

Scientific notation is a way of writing really huge, or really tiny, numbers that saves time and space and ink, etc. For example, the World Book Encyclopedia lists the Earth's mass as 6,000,000,000,000,000,000,000 kilograms.

Why write such an unwieldy number when you can, instead, write 6.0×10^{24} kg.

The classical radius of an electron is 0.000000000000028179 meters.

Again, why write such a space wasting number when you can write it like so: 2.8179×10^{-15} m

Scientific Notation

Scientific notation is an exponential expression using a power of 10 where $1 \leq |N| < 10$ and P is an integer.

$$N \times 10^P$$



Planet	Approximate Distance to the Sun (in miles)	Distance Written in Scientific Notation
Mercury	36,000,000	3.6×10^7
Venus	67,000,000	6.7×10^7
Earth	93,000,000	9.3×10^7
Mars	142,000,000	1.42×10^8
Jupiter	484,000,000	4.84×10^8
Saturn	888,000,000	8.88×10^8
Uranus	1,784,000,000	1.784×10^9
Neptune	2,799,000,000	2.799×10^9

Powers of Ten & Scientific Notation...

- Scientific notation uses powers of 10.
- Each time you multiply a decimal value by 10, the decimal point moves one to the right.
- Each time you divide by 10, the decimal point moves one to the left.



Multiplying by Tens

4.5 $\times 10$
 45 $\times 10$
 450 $\times 10$
 4500 $\times 10$
 45000 $\times 10$
 $45000 = 4.5 \times 10^4$

Dividing by Tens

4.5 $\div 10$
 0.45 $\div 10$
 0.045 $\div 10$
 0.0045 $\div 10$
 0.00045 $\div 10$
 $0.00045 = 4.5 \times 10^{-4}$

Dividing by 10 is the same as multiplying by 10^{-1}



Convert 52,000 to scientific notation.

$52,000 = 5.2 \times 10^4$ $N \times 10^P$

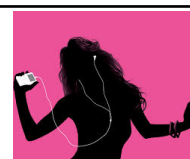
Try: $4,730,000 = 4.73 \times 10^6$

Try: $624 = 6.24 \times 10^2$



Convert 0.000023 to scientific notation.

$0.000023 = 2.3 \times 10^{-5}$



Write in scientific notation:

$0.00492 = 4.92 \times 10^{-3}$

Try: $0.00000078 = 7.8 \times 10^{-7}$



Write the following number in standard notation.

a. $3.8 \times 10^5 =$

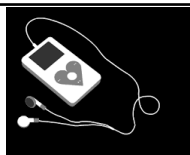
3,800,000.



Four truck drivers kept track of their mileage for the year. The chart below shows the number of miles each one drove. List the drivers in order from the least mileage driven to the greatest mileage driven.



Name	Mileage	Standard Notation
Sam	5.41×10^4	54,100
Tom	3×10^4	30,000
Pete	25,000	25,000
Juan	1.1×10^5	110,000



Write the following number in standard notation.

b. 6.12×10^{-3}

0.00612