Write each number without any exponents.

1. 10^3

1,000

2. 10^6

1,000,000

Write each number as a power of 10 using positive exponents.

1. $10,000$

10^4

2. $10,000,000$

10^7

Write each number as a fraction and without ANY exponents

1. 10^{-2}

$\frac{1}{10^2}$

$\frac{1}{100}$

2. 10^{-5}

$\frac{1}{10^5}$

$\frac{1}{100,000}$

Write each number as a power of 10 using negative exponents.

1. $\frac{1}{10,000}$

$\frac{1}{10^4}$

10^{-4}

2. $\frac{1}{1,000,000}$

$\frac{1}{10^6}$

10^{-6}

Write each number without any exponents or fractions.

1. 10^{-3}

$\frac{1}{10^3}$

$\frac{1}{1000}$

.001

2. 10^{-6} $\frac{1}{10^6}$ $\frac{1}{1\,000\,000}$

.000001

Scientific Notation:

A number between 1 and 10 times a power of 10.

It's a compact way to write really large or really small numbers.

Examples:

5.209×10^{7} 8.33×10^{-4}

Scientific Notation

$25{,}000 = 2.5 \times 10^{4}$

Standard Notation

Is each number written in scientific notation?

1. 63.91×10^{5}

No, 63.91 is bigger than 10

2. 1.0031×10^{-3}

Yes

3. 0.98974×10^{-6}

No, 0.98974 is smaller than 1

Does each scientific notation number represent a "big" number or a "small" number?

Big means bigger than 1 and small means smaller than 1

1. 7.908×10^{-5} Small
2. 3.74×10^{2} BIG
3. 2.0027×10^{8} BIG
4. 9.998×10^{-3} Small

When in Scientific Notation:

A negative exponent means a SMALL number

A positive exponent means a BIG number

Write each number in Standard Notation

1. 1.004×10^{-6} 0.000001004
2. 8.3×10^{3} 8300
3. 6.23×10^{-4} 0.000623
4. 5.003×10^{5} 500,300

Write each number in Scientific Notation.

1. 327,500.

You must move the decimal point 5 times to create a number between 1 and 10.

3.275×10^{5}

The exponent is positive because the beginning number 327,500 is a "big" number (>1)

2. 0.00001102

You must move the decimal point 5 times to create a number between 1 and 10.

1.102×10^{-5}

The exponent is negative because the beginning number 0.00001102 is a "small" number (<1)

Each number is NOT in Scientific Notation. Rewrite it so that it IS in Scientific Notation.

This part gets smaller

So this part must get bigger by an equal amount

1. $223 \times 10^{5+2} = 223{,}000{,}00.$

2.23×10^{7}

2. $4561 \times 10^{-8+3}$

4.561×10^{-5}

3. $0.00819 \times 10^{-3-3}$

8.19×10^{-6}

4. $0.0755 \times 10^{4-2}$

7.55×10^{2}