Scientific Notation

Remember?

Expressions 10^4, 10^{11}, or 10^7, etc. are called **powers of ten**. In any power of ten, the exponent tells you how many *zeros* to write after the one.

Remember also:

2×10^5 means $2 \times 100{,}000$, which equals 200,000.

8×10^7 means $8 \times 10{,}000{,}000$, which equals 80,000,000.

10^6	1,000,000
10^5	100,000
10^4	10,000
10^3	1,000
10^2	100
10^1	10
10^0	1

We can write *any number* using a power of ten and a decimal number between 1 and 10. This way of writing numbers is called *scientific notation*. The numbers below are written using scientific notation, and in a normal way.

Scientific Notation	(in-between calculation)	Normal way
6.7×10^4	$6.7 \times 10{,}000$	**67,000**
2.83×10^6	$2.83 \times 1{,}000{,}000$	**2,830,000**
5.089×10^5	$5.089 \times 100{,}000$	**508,900**
1.03×10^8	$1.03 \times 100{,}000{,}000$	**103,000,000**

Example 1. How do you write $5.089 \times 100{,}000$ in the normal way? A hundred thousand needs to be the *largest place value* in the number. Simply write the digits 5089 and add enough zeros so that 5 becomes the digit in the hundred thousands. The answer is 508,900.

Example 2. How do you write $2.83 \times 1{,}000{,}000$ in the normal way? Just write the digits 283 and add enough zeros in the end so that the *largest place value* in the number ends up being millions. So, $2.83 \times 1{,}000{,}000$ becomes 2,830,000.

1. Fill in the table. It has the same numbers written in different ways.

Scientific Notation	(in-between calculation)	Normal way
6×10^5		
2.5×10^5		
5.39×10^4		
2.03×10^6		
8.904×10^3		
1.5594×10^8		

Sample worksheet from
www.mathmammoth.com