

# 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:

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

$8 \times 10^7$  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
$6.7 \times 10^4$	$6.7 \times 10,000$	<b>67,000</b>
$2.83 \times 10^6$	$2.83 \times 1,000,000$	<b>2,830,000</b>
$5.089 \times 10^5$	$5.089 \times 100,000$	<b>508,900</b>
$1.03 \times 10^8$	$1.03 \times 100,000,000$	<b>103,000,000</b>

**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
$6 \times 10^5$		
$2.5 \times 10^5$		
$5.39 \times 10^4$		
$2.03 \times 10^6$		
$8.904 \times 10^3$		
$1.5594 \times 10^8$		