

Creating Exponents

Imagine that you are writing a paper for your science class and need to write many very large numbers, such as 10,000,000,000,000. Your fingers would get pretty tired writing all those zeros. However, there is a simpler way to express these large powers of 10. An **exponent** is a small number placed above and to the right of a base number to show how many times the base number is multiplied by itself. For example, 100,000 is 10 multiplied by itself five times, or $10 \times 10 \times 10 \times 10 \times 10$. Written in exponential form, 100,000 is 10^5 . The exponent number tells you how many zeros are in your power of 10.

PROCEDURE: To change a power of 10 into exponential form, first count the number of zeros in your power of 10. This number will be your exponent. Place the exponent above and to the right of the base number of 10.

SAMPLE PROBLEM: Write 10,000,000,000,000 in exponential form.

Step 1: Count the zeros in your power of 10.

10,000,000,000,000 has 13 zeros.

Step 2: Place your exponent above and to the right of your base number 10.

10^{13}

$$10,000,000,000,000 = 10^{13}$$

On Your Own!

1. Convert the following powers of 10 into exponential form:

a. $1000 =$ _____ b. $10,000,000 =$ _____

c. $1,000,000 =$ _____ d. $10,000,000,000 =$ _____

e. $10,000,000,000,000,000,000,000,000,000,000 =$ _____

2. Change the following exponent numbers into powers of 10:

a. $10^5 =$ _____ b. $10^2 =$ _____

c. $10^9 =$ _____ d. $10^{12} =$ _____

e. $10^{29} =$ _____

