Whole Numbers with Exponents

Vocabulary

Base	The number that is the factor in exponential notation. Given 2^3, the 2 is the base.
Exponent	The number of times the base is to be multiplied by itself. Given 2^3, the 3 is the exponent or power.

$2 \cdot 2 \cdot 2$ can be written 2^3 and is read "2 to the third power" $2^3 = 8$

3^2 means $3 \cdot 3$ and is read "3 to the second power" $3^2 = 9$

1^3 means $1 \cdot 1 \cdot 1$ which equals 1   In fact, the number 1 raised to any natural number is 1.

3^0 equals 1   Any whole number , other than 0, raised to the zero power is 1.
      (Reasons for this will be explained in a future course.)

TRY evaluating the following expressions as quickly as you can.

$1^0 =$ ____	$2^0 =$ ____	$3^0 =$ ____	$5^0 =$ ____	$7^2 =$ ____
$1^1 =$ ____	$2^1 =$ ____	$3^1 =$ ____	$5^1 =$ ____	$8^2 =$ ____
$1^2 =$ ____	$2^2 =$ ____	$3^2 =$ ____	$5^2 =$ ____	$9^2 =$ ____
$1^3 =$ ____	$2^3 =$ ____	$3^3 =$ ____	$5^3 =$ ____	$10^2 =$ ____
$1^4 =$ ____	$2^4 =$ ____	$4^0 =$ ____	$6^0 =$ ____	$11^2 =$ ____
$1^5 =$ ____	$2^5 =$ ____	$4^1 =$ ____	$6^1 =$ ____	$12^2 =$ ____
$1^6 =$ ____		$4^2 =$ ____	$6^2 =$ ____	$13^2 =$ ____

Powers of 10:   Exponential notation with 10 as the base.
Place Value: The place values of our number system correspond to the powers of 10.

Standard (numerical) Form: 5,367
Expanded Form: (5 x 1,000) + (3 x 100) + (6 x 10) + (7 x 1)
Powers of 10 Form: (5×10^3) + (3×10^2) + (6×10^1) + (7×10^0)

Standard (numerical) Form: 400,012,508
Expanded Form: (4 x 100,000,000) + (1 x 10,000) + (2 x 1,000) + (5 x 100) + (8 x 1)
Powers of 10 Form: (4×10^8) + (1×10^4) + (2×10^3) + (5×10^2) + (8×10^0)

Notice how the exponent on the base 10 corresponds to the number of zeros in the place value.

Using Scientific Notation
Rounding a value to one significant digit (rounding to the first place value on the left of the number) and writing the result using powers of 10 is called using **scientific notation**.

Round 485,352,943 to one significant digit and write the result in scientific notation: 500,000,000 = 5×10^8

TRY: Round 352,943 to one significant digit and write the result in scientific notation: