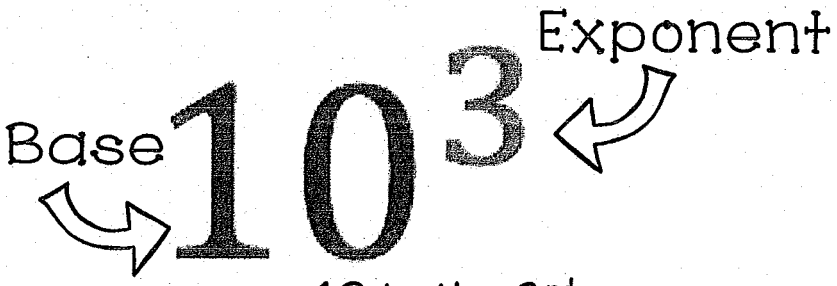
Multiplying and Dividing by Powers of 10 *with exponents*

Name: _____

An ***exponent*** tells you how many times a base is used as a factor.



10 to the 3rd power means 10 x 10 x 10 or 1,000.

Example #1: $16 \times 10^2 =$ $10^2 = 10 \times 10 =$ _____ $16 \times 100 =$ _____	Example #2: $2{,}700 \div 10^3 =$ $10^3 = 10 \times 10 \times 10 =$ _____ $2{,}700 \div 1{,}000 =$ _____
Example #3: $0.7 \times 10^3 =$	Example #4: $14.5 \div 10^2 =$
Example #5: $63 \times 10^4 =$	Example #6: $5{,}192 \div 10^3 =$

IN PARTNERS

1) $4 \times 10^2 =$ $10^2 = 10 \times 10 =$ _____ $4 \times 100 =$ _____	2) $8{,}000 \div 10^3 =$ $10^3 = 10 \times 10 \times 10 =$ _____ $8{,}000 \div 1{,}000 =$ _____
3) $2.9 \times 10^3 =$ $10^3 = 10 \times 10 \times 10 =$ _____ $2.9 \times 1{,}000 =$ _____	4) $75 \div 10^2 =$ $10^2 = 10 \times 10 =$ _____ $75 \div 100 =$ _____
5) $14 \times 10^2 =$	6) $893 \div 10^3 =$
7) $5.3 \times 10^3 =$	8) $25{,}000 \div 10^2 =$
9) $0.47 \times 10^4 =$	10) $6{,}789 \div 10^2 =$

Independent Practice

1) $78 \times 10^2 =$ $10^2 = 10 \times 10 =$ _____ $78 \times 100 =$ _____	2) $6{,}000 \div 10^3 =$ $10^3 = 10 \times 10 \times 10 =$ _____ $6{,}000 \div 1{,}000 =$ _____
3) $18 \times 10^3 =$ $10^3 = 10 \times 10 \times 10 =$ _____ $18 \times 1{,}000 =$ _____	4) $370 \div 10^2 =$ $10^2 = 10 \times 10 =$ _____ $370 \div 100 =$ _____
5) $49 \times 10^2 =$	6) $432 \div 10^3 =$
7) $0.9 \times 10^3 =$	8) $5{,}600 \div 10^2 =$
9) $0.02 \times 10^3 =$	10) $59 \div 10^2 =$

Independent Practice

11) $15 \times 10^2 =$	12) $879 \div 10^3 =$
13) $0.45 \times 10^3 =$	14) $4.6 \div 10^2 =$
15) $0.419 \times 10^2 =$	16) $8{,}932 \div 10^3 =$
17) $0.008 \times 10^3 =$	18) $1.9 \div 10^2 =$
19) $0.071 \times 10^4 =$	20) $15{,}678.1 \div 10^5 =$

Independent Practice

21) $5 \times 10^4 =$	22) $80{,}000 \div 10^5 =$
23) $0.71 \times 10^5 =$	24) $46 \div 10^4 =$
25) $6.9 \div 10^6 =$	26) $9{,}000{,}000 \div 10^5 =$
27) $0.008 \times 10^8 =$	28) $195 \div 10^5 =$
29) $0.51 \times 10^{10} =$	30) $34.72 \div 10^8 =$

CHALLENGE

1) Complete the statement below using a power of 10 using an exponent.

2.73 x _____ = 27,300

2) Complete the statement below using a power of 10 using an exponent.

893 ÷ _____ = 0.893

3) Complete the blank below:

_____ x 10^3 = 47.5

4) Complete the blank below:

_____ ÷ 10^5 = 0.0092

5) Complete the blank below:

_____ x 10^4 = 78,000,000

6) Complete the blank below:

_____ ÷ 10^7 = 0.0915

7) ***Scientific notation*** is a way to express extremely big and extremely small numbers using exponents. For example, the water surface area of the Earth is 1.4 x 10^8. How would this number be written in standard form?

8) Extremely small numbers are expressed with negative exponents. For example, the mass of a dust particle is 7.53 x 10^{-10}. This means the same thing as 7.53 ÷ 10^{10}. How would this number be written in standard form?