

Scientific Notation & Sig Figs

1. Complete this series of exponents ...

Decimal Value	Fractional Value	Exponential Value
1,000	1,000/1	10^3
100	100/1	
10	10/1	
1	1/1	
0.1	1/10	
0.01	1/100	
0.001	1/1000	

2. Rewrite each number below in scientific notation ...

110 = _____	0.025 = _____
12,000 = _____	0.12 = _____
5,280 = _____	0.000 12 = _____
254,000 = _____	0.000 001 = _____
1.2 = _____	0.002 = _____
454 = _____	0.000 000 8 = _____
15,000,000 = _____	0.05 = _____

3. Rewrite each number below in decimal notation ...

$1.25 \times 10^2 =$ _____	$3.5 \times 10^{-2} =$ _____
$5.65 \times 10^5 =$ _____	$9.4 \times 10^{-5} =$ _____
$3.9 \times 10^1 =$ _____	$7.44 \times 10^{-1} =$ _____
$9.2 \times 10^4 =$ _____	$8.5 \times 10^{-7} =$ _____
$8.33 \times 10^{10} =$ _____	$2.7 \times 10^{-3} =$ _____
$4.6 \times 10^0 =$ _____	$5.55 \times 10^{-9} =$ _____
$2.8 \times 10^3 =$ _____	$1.1 \times 10^0 =$ _____

4. Scientific Notation and Sig Figs ...

How many sig. figs are in each number below?

0.0120 1,000 100.0 105.0 1000.001

Scientific notation and decimal notation are two different ways to represent the same number. Therefore, when converting between the two styles of notation each number must have the same number of sig figs. Check these equivalences below ...

$125 = 1.25 \times 10^2$	$0.0125 = 1.25 \times 10^{-2}$
$1,250 = 1.25 \times 10^3$	$0.01250 = \underline{\hspace{2cm}}$
$1,250. = 1.250 \times 10^3$	$1.025 \times 10^3 = 1,025 \text{ or } 1,025.$
$1,250.0 = 1.2500 \times 10^3$	$1.025 \times 10^4 = 10,250$
$10,250 = \underline{\hspace{2cm}}$	$1.0250 \times 10^4 = \underline{\hspace{2cm}}$
$0.125 = 1.25 \times 10^{-1}$	$1.02500 \times 10^4 = \underline{\hspace{2cm}}$

Rewrite each number below in the opposite notation. As you do, observe the rules for significant figures!

$340 = \underline{\hspace{2cm}}$	$6.500 \times 10^3 = \underline{\hspace{2cm}}$
$680. = \underline{\hspace{2cm}}$	$9.430 \times 10^2 = \underline{\hspace{2cm}}$
$0.0125 = \underline{\hspace{2cm}}$	$93,000,000 = \underline{\hspace{2cm}}$
$0.10 = \underline{\hspace{2cm}}$	$5280. = \underline{\hspace{2cm}}$
$0.0250 = \underline{\hspace{2cm}}$	$10 = \underline{\hspace{2cm}}$
$3.4 \times 10^3 = \underline{\hspace{2cm}}$	$0.01 = \underline{\hspace{2cm}}$
$8.30 \times 10^2 = \underline{\hspace{2cm}}$	$0.040 = \underline{\hspace{2cm}}$
$3.10 \times 10^{-2} = \underline{\hspace{2cm}}$	$2.3 \times 10^5 = \underline{\hspace{2cm}}$
$10,000 = \underline{\hspace{2cm}}$	$4.5000 \times 10^2 = \underline{\hspace{2cm}}$
$100.1 = \underline{\hspace{2cm}}$	$6.1 \times 10^3 = \underline{\hspace{2cm}}$
$3.00 \times 10^1 = \underline{\hspace{2cm}}$	$9.60 \times 10^{-4} = \underline{\hspace{2cm}}$
$8.1001 \times 10^2 = \underline{\hspace{2cm}}$	$5,050 = \underline{\hspace{2cm}}$

Scientific Notation

1. Complete this series of exponents ...

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1,000	1,000/1	10^3
100	100/1	10^2
10	10/1	10^1
1	1/1	10^0
0.1	1/10	10^{-1}
0.01	1/100	10^{-2}
0.001	1/1000	10^{-3}

2. Rewrite each number below in scientific notation ...

110 = 1.1×10^2	0.025 = 2.5×10^{-2}
12,000 = 1.2×10^4	0.12 = 1.2×10^{-1}
5,280 = 5.28×10^3	0.000 12 = 1.2×10^{-4}
254,000 = 2.54×10^5	0.000 001 = 1×10^{-6}
1.2 = 1.2×10^0	0.002 = 2×10^{-3}
454 = 4.54×10^2	0.000 000 8 = 8×10^{-7}
15,000,000 = 1.5×10^7	0.05 = 5×10^{-2}

3. Rewrite each number below in decimal notation ...

$1.25 \times 10^2 = 125$	$3.5 \times 10^{-2} = 0.035$
$5.65 \times 10^5 = 565,000$	$9.4 \times 10^{-5} = 0.000 094$
$3.9 \times 10^1 = 39$	$7.44 \times 10^{-1} = 0.744$
$9.2 \times 10^4 = 92,000$	$8.5 \times 10^{-7} = 0.000 000 85$
$8.33 \times 10^{10} = 83,300,000,000$	$2.7 \times 10^{-3} = 0.0027$
$4.6 \times 10^0 = 4.6$	$5.55 \times 10^{-9} = 0.000 000 00555$
$2.8 \times 10^3 = 2,800$	$1.1 \times 10^0 = 1.1$

4. Scientific Notation and Sig Figs ...

How many sig. figs are in each number below?

0.0120 1,000 100.0 105.0 1000.001

Scientific notation and decimal notation are two different ways to represent the same number. Therefore, when converting between the two styles of notation each number must have the same number of sig figs. Check these equivalences below ...

$125 = 1.25 \times 10^2$	$0.0125 = 1.25 \times 10^{-2}$
$1,250 = 1.25 \times 10^3$	$0.01250 = \underline{1.250 \times 10^{-2}}$
$1,250. = 1.250 \times 10^3$	$1.025 \times 10^3 = 1,025 \text{ or } 1,025.$
$1,250.0 = 1.2500 \times 10^3$	$1.025 \times 10^4 = 10,250$
$10,250 = \underline{1.025 \times 10^4}$	$1.0250 \times 10^4 = \underline{10,250.}$
$0.125 = 1.25 \times 10^{-1}$	$1.02500 \times 10^4 = \underline{10250.0}$

Rewrite each number below in the opposite notation. As you do, observe the rules for significant figures!

$340 = \underline{3.4 \times 10^2}$	$6.500 \times 10^3 = \underline{6,500.}$
$680. = \underline{6.80 \times 10^2}$	$9.430 \times 10^2 = \underline{943.0}$
$0.0125 = \underline{1.25 \times 10^{-2}}$	$93,000,000 = \underline{9.3 \times 10^7}$
$0.10 = \underline{1.0 \times 10^{-1}}$	$5280. = \underline{5.280 \times 10^3}$
$0.0250 = \underline{2.50 \times 10^{-2}}$	$10 = \underline{1 \times 10^1}$
$3.4 \times 10^3 = \underline{3,400}$	$0.01 = \underline{1 \times 10^{-2}}$
$8.30 \times 10^2 = \underline{830.}$	$0.040 = \underline{4.0 \times 10^{-2}}$
$3.10 \times 10^{-2} = \underline{0.0310}$	$2.3 \times 10^5 = \underline{230,000}$
$10,000 = \underline{1 \times 10^4}$	$4.5000 \times 10^2 = \underline{450.00}$
$100.1 = \underline{1.001 \times 10^2}$	$6.1 \times 10^3 = \underline{6,100}$
$3.00 \times 10^1 = \underline{30.0}$	$9.60 \times 10^{-4} = \underline{0.000960}$
$8.1001 \times 10^2 = \underline{810.01}$	$5,050 = \underline{5.05 \times 10^3}$