

8.4: Scientific Notation

Why do we use it?

Really Big #s or

Really Small #s

to be easier to compare

A # is written in scientific notation when it is of the form $c \times 10^n$ where $1 \leq c < 10$ and n is an integer.



a pos. or neg. whole #.

| # | standard | scientific |
|------------------|------------|--------------------|
| Two million | 2,000,000. | 2×10^6 |
| Five thousandths | 0.005. | 5×10^{-3} |

going from standard \rightarrow scientific

- if you move decimal to the left your exponent is positive

42,590,000

sci $\rightarrow 4.259 \times 10^7$

- if you move decimal to the right your exponent is negative

0.0000574

sci $\rightarrow 5.74 \times 10^{-5}$

on your own:

① 2.67,500,000

$$2.675 \times 10^8$$

② 0.000486

$$4.86 \times 10^{-4}$$

③ 45.

$$4.5 \times 10^1$$

④ 0.234

$$2.34 \times 10^{-1}$$

Scientific \rightarrow Standard

a) 2.0075×10^6

2,007,500

b) 1.685×10^{-4}

0.0001685

On Your Own:

① 7.0234×10^5
 $702,340$

② 3.096×10^{-6}
 0.000003096

③ 2.1×10^8
 $210,000,000$

④ 4.630×10^{-2}
 0.0463

① Write in sci. notation: 0.0015
 1.5×10^{-3}

② Write in sci. notation: 100,456
 1.00456×10^5

③ Write in standard notation:

132500 1.325×10^5 ~~1325000000~~

④ Write in sci. notation: 24.5
 2.45×10^1

⑤ Write in standard notation:
 8.15×10^{-8} 0.0000000815

Order 103,400,000 ♀

7.8×10^8 ♀

80,760,000

from least to greatest

Step 1: Write all #s in sci notation

1.034×10^8 ♀ 7.8×10^8 ♀ 8.076×10^7

Step 2: Least → greatest

8.076×10^7 , 1.034×10^8 , 7.8×10^8

Step 3: Write in original form

$80,760,000$ → $103,400,000$ → 7.8×10^8

$$2.7 \times 10^5 \neq 3.401 \times 10^4 \neq$$
$$27,500 \neq 2.75 \times 10^4$$

least \rightarrow greatest

$$2.75 \times 10^4, 3.401 \times 10^4, 2.7 \times 10^5$$

$$27,500 \rightarrow 3.401 \times 10^4 \rightarrow 2.7 \times 10^5$$

