

CHEM 101 How to convert a number to scientific notation

A number in scientific notation: 3.26×10^{-5}

coefficient (must be between 1.0 and 9.999...)

Exponential factor
+ sign indicates large number
- sign indicates small number

To build confidence, follow this 4-step method:

- Step 1: If number = 10 or more, think +, if less than 1.0, think – this will be the sign of the exponent
- Step 2: Move the decimal to give a number between 1.0 and 9.9999
Write this coefficient (drop any trailing zeros)
- Step 3: Count the places moved and enter this number as the exponent
(if you did not move the decimal place the exponent is 0)
- Step 4: Put a + or – in front of the exponent (a + can be left off)

Example: Write 507,000 in scientific notation

- Step 1: the number is more than 10, +
- Step 2: the coefficient is **5.07**
- Step 3: the decimal was moved 5 places, 5.07×10^5
- Step 4 the sign of the exponent is +
507,000 in scientific notation = 5.07×10^5 (or 5.07×10^5)

Now, use the method on these numbers:

- 0.0067
- 12,000
- 0.00000353
- 127,000,000
- 17.4
- 5.8

Check your results with the answers on the next page.

With practice, you should be able to write the answer directly without using the steps

- a) $0.0067 = 6.7 \times 10^{-3}$
- b) $12,000 = 1.2 \times 10^4$
- c) $0.00000353 = 3.53 \times 10^{-6}$
- d) $127,000,000 = 1.27 \times 10^8$
- e) $17.4 = 1.74 \times 10^1$
- f) $5.8 = 5.8 \times 10^0$

More practice: write the numbers below in scientific notation directly (without using the four steps). Check your results with the answers on the next page.

- g) 360
- h) 0.00054
- i) 183,000
- j) 0.15
- k) 992,000,000

g) $360 = 3.6 \times 10^2$

h) $0.00054 = 5.4 \times 10^{-4}$

i) $183,000 = 1.83 \times 10^5$

j) $0.15 = 1.5 \times 10^{-1}$

k) $99,000,000 = 9.9 \times 10^7$