

# Scientific Notation

In Scientific Notation all numbers are written with one digit only to the left of the decimal. The decimal is located with 10 raised to an exponent.

Example 1:

4 625 000 is written  $4.625 \times 10^6$

The decimal has been moved 6 places to the left, leaving one figure to the left of the decimal. This has decreased the value by 6 factors of 10 so we multiply by  $10^6$ .

Example 2:

0.0004625 is written  $4.625 \times 10^{-4}$

The decimal has been moved 4 places to the right, increasing the value by 4 factors of 10.

In science, we often deal with numbers that are either very large or very small, for example:

806 000 000 000

0.000 000 058

To save writing so many zeros, it is more convenient to express these numbers in scientific notation. They would be written:

$8.06 \times 10^{11}$  and  $5.8 \times 10^{-8}$

## Exercises:

Write in proper Scientific Notation

A.

1. 3 900 000 000 000

2. 93 000 000

11. 30.003

12. 400.2

- |     |                |     |           |
|-----|----------------|-----|-----------|
| 3.  | 29 979 300 000 | 13. | 0.058     |
| 4.  | 250 000 000    | 14. | 0.42      |
| 5.  | 176 000 000    | 15. | 0.0029    |
| 6.  | 0.000000003    | 16. | 1760      |
| 7.  | 0.0000015      | 17. | 6.9       |
| 8.  | 0.0000268      | 18. | 0.0000367 |
| 9.  | 0.000003572    | 19. | 0.002056  |
| 10. | 125.6          | 20. | 0.00052   |

B.

- |    |                         |     |                         |
|----|-------------------------|-----|-------------------------|
| 1. | $58 \times 10^3$        | 6.  | $0.035 \times 10^5$     |
| 2. | $381 \times 10^2$       | 7.  | $0.012 \times 10^{-4}$  |
| 3. | $0.62 \times 10^4$      | 8.  | $32\,000 \times 10^3$   |
| 4. | $91 \times 10^{-3}$     | 9.  | $0.00057 \times 10^8$   |
| 5. | $4\,620 \times 10^{-1}$ | 10. | $0.0004 \times 10^{-6}$ |

C.

1.  $(27 \times 10^9) (1 \times 10^{-6})$
2.  $(356 \times 10^5) (1 \times 10^{-8})$
3.  $\frac{4.7 \times 10^2}{1 \times 10^3}$
4.  $\frac{(796 \times 10^4) (1 \times 10^{-2})}{1 \times 10^{-7}}$
5.  $\frac{0.25 \times 10^{-3}}{1 \times 10^{-5}}$
6.  $(1.35 \times 10^2) (2 \times 10^4)$
7.  $\frac{7.2 \times 10^6}{2 \times 10^4}$
8.  $\frac{(32 \times 10^{-5}) (0.2 \times 10^1)}{0.4 \times 10^4}$
9.  $\frac{640 \times 10^5}{0.00016 \times 10^3}$

Answer Key available in LSS.