SCIENCE FOUNDATIONS

Scientific notation

Difficulty level: Intermediate

This document was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

Overview of the concept

This is how scientists write the distance to the stars or the size of a virus without filling a page with zeros, so the numbers stay readable and comparable. An astronomer comparing the distance to two stars can see at a glance which is farther, without counting zeros. A microbiologist writing the size of a virus in the same form can compare it with a bacterium directly. Knowing scientific notation tells you how to handle numbers too big or too small for everyday writing, and keep them easy to compare.



Rule

Scientific notation: write a number as $a \times 10^n$, where a is from 1 up to (but not including) 10.

The exponent counts how many places the decimal point moved, positive for large numbers and negative for small numbers.

© 2026 Brett Robbins. All Rights Reserved.

Worked examples

EXAMPLE 1

Q Write 45,000 in scientific notation.

SOLUTION

Move the decimal point until one digit is before it: 4.5.

Count the places moved: four places left, so the exponent is + 4.

4.5×10^{4}

The result is 4.5×10^{4}.

EXAMPLE 2

Q Write 0.0032 in scientific notation.

SOLUTION

Move the decimal point until one digit is before it: 3.2.

Count the places moved: three places right, so the exponent is -3.

3.2×10^{-3}

The result is 3.2×10^{-3}.

© 2026 Brett Robbins. All Rights Reserved.

Practice questions

1 Write 9,500,000,000,000 km in scientific notation.

- **A** 9.5×10^{12}
- **B** 9.5×10^{11}
- **C** 95×10^{12}
- **D** 9.5×10^{13}

Understand It with Pulse | Flag a mistake

2 Write 0.00000012 m in scientific notation.

- **A** 1.2×10^{7}
- **B** 1.2×10^{-7}
- **C** 12×10^{-7}
- **D** 1.2×10^{-6}

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

3 What is the exponent of 4,800,000 in scientific notation?

Understand It with Pulse | Flag a mistake

4 What is the exponent of 0.000002 in scientific notation?

Understand It with Pulse | Flag a mistake

5 Is 12×10^4 correct scientific notation? Answer yes or no.

A Yes

B No

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

6 What is the first part of $0.000000000000000000000000000000911$ kg in scientific notation?

Understand It with Pulse | Flag a mistake

7 Which is larger: 6×10^8 or 6×10^6?

A 6×10^6

B 6×10^8

C They are equal

D 6×10^{-8}

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

8 Write 3×10^{-4} as an ordinary number.

- A 0.0003
- B 0.003
- C 30000
- D 0.00003

Understand It with Pulse | Flag a mistake

9 What is the value of 10^{-3}?

- A 1000
- B 0.001
- C -1000
- D 0.01

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

10 Write 4.2×10^6 as an ordinary number.

A 4,200,000

B 420,000

C 42,000,000

D 0.0000042

Understand It with Pulse | Flag a mistake

© 2026 Brett Robbins. All Rights Reserved.

ANSWER KEY

1. 9.5×10^{12}

2. 1.2×10^{-7}

3. 6

4. -6

5. No

6. 9.11

7. 6×10^{8}

8. 0.0003

9. 0.001

10. 4,200,000

© 2026 Brett Robbins. All Rights Reserved.