

science

4.4 Scientific Notation



Did you know the Earth is
93,000,000 miles from the sun?

Did you know that fingernails grow at
a rate of 0.00286 inches per day?



Scientific notation is a shorter method for writing
very large and very small numbers.

93,000,000 is written 9.3×10^7 in scientific notation.

The constant (9.3) must be
greater than or equal to 1 and less than 10.

The power is always written with a base of 10 and an exponent
expressing the number of places the decimal was moved.

Big numbers have an exponent that is positive.

Example: 62,500 becomes 6.25×10^4 .

Small numbers have an exponent that is negative.

Example: 0.0247 becomes 2.47×10^{-2}

Remember to move the decimal so the coefficient is greater than 1 and less than 10.

Practice

BIG → POSITIVE SMALL → NEGATIVE

Write the following numbers in scientific notation.

1. 256,000,000 2.56×10^8 2. 0.0036 3.6×10^{-3}

3. 68,092,000 6.8092×10^7 4. 0.444 4.44×10^{-1}

5. 90,800 9.08×10^4 6. 0.0000589 5.89×10^{-5}

7. 1,368,500,000 1.3685×10^9 8. 0.00027 2.7×10^{-4}

9. 674,000 6.74×10^5 10. 0.07070700
 7.0707×10^{-2}



Questions to think about!!!

How do you know that a number written in scientific notation will be a really big or a really small number?

Look at the exponent!!

When do you write a negative exponent when converting to scientific notation?

SMALL

When do you write a positive exponent when converting to scientific notation?

BIG

Changing from Scientific Notation to Decimal Form

When the exponent is **positive**, move the decimal to the **right**.

When the exponent is **negative**, move the decimal to the **left**.

The exponent tells you how many places to move it.

Examples

11. 2.83×10^5 *BIG*

2.83000

283000

12. 1.23×10^{-3} *SMALL*

0.00123

0.00123

Practice

13. 5.6×10^1 ^{BIG}

5.6

15. 4.9×10^4 ^{BIG}

49,000

49,000

17. 1.045×10^7 ^{BIG}

1,045,000

1,045,000

14. 8×10^{-1} ^{SMALL}

.8

0.8

16. 9.2×10^{-8} ^{SMALL}

.000000092

0.000000092

18. 8.4×10^{-6} ^{SMALL}

.0000084

0.0000084