

SCIENTIFIC NOTATION

Name: _____ Period: _____

SCIENTIFIC NOTATION

- Scientific notation is a shorthand way of writing really _____ or really _____ numbers.
- Scientific notation is written as a _____ of two numbers:
 - The first number must be between ____ and ____
 - The second number must be a _____ of 10

CONVERTING STANDARD TO SCIENTIFIC

- 1 Create a number between ____ and ____ by moving the decimal.
- 2 Count the number of times that you moved the decimal. This number will be your _____ of 10.
- 3 If your number is greater than one, the exponent will be _____.
- 4 If your number is less than one (like a decimal), the exponent will be _____.

Complete the following problems.

1. Convert the number to scientific notation. 1,850,000 _____	2. Convert the number to scientific notation. 42,000 _____
3. Convert the number to scientific notation. 0.007826 _____	4. Convert the number to scientific notation. 0.00001 _____

CONVERTING SCIENTIFIC TO STANDARD

- Move the decimal the same number of places as the _____.
- If the exponent is positive, move the decimal to the _____ in order to make the number _____. (Add zeros as placeholders if necessary.)
- If the exponent is negative, move the decimal to the _____ in order to make the number _____. (Add zeros as placeholders if necessary.)

Complete the following problems.

5. Convert the number to standard notation. 7.83×10^7 _____	6. Convert the number to standard notation. 2.5×10^4 _____												
7. Convert the number to standard notation. 8.345×10^{-6} _____	8. Convert the number to standard notation. 3×10^{-3} _____												
9. Complete the missing blanks in the table below.													
<table border="1"> <thead> <tr> <th>Standard Notation</th> <th>Scientific Notation</th> </tr> </thead> <tbody> <tr> <td>5,820,000</td> <td></td> </tr> <tr> <td></td> <td>4.25×10^5</td> </tr> <tr> <td>1,200</td> <td></td> </tr> <tr> <td></td> <td>6.257×10^{-7}</td> </tr> <tr> <td>.0015</td> <td></td> </tr> </tbody> </table>		Standard Notation	Scientific Notation	5,820,000			4.25×10^5	1,200			6.257×10^{-7}	.0015	
Standard Notation	Scientific Notation												
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Write 7.9×10^5

$$7.9 \times 10^5 = 790,000$$

Write 3.22×10^{-4}

$$3.22 \times 10^{-4} = 0.000322$$

Scientific notation is a useful way of representing numbers, especially a very great number, a very low number, or a number very close to zero. A number expressed this way is shown as a product of two numbers. The first number is greater than or equal to 1 but less than 10. The second number is a power of 10.

Standard Form \longrightarrow 29,830,000 = 2.983×10^7 \longleftarrow Scientific Notation

To express a whole number in scientific notation, place a decimal point at the end of the number. Then move the decimal point to form a number greater than or equal to 1 but less than 10. This is the first number in the expression using scientific notation. The second number is a power of 10 with an exponent that equals the number of places you moved the decimal point to the left.

$$530,000,000 = 5.3 \times 10^8$$

Scientific Notation

In this lesson, you will

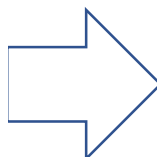
- identify numbers written in scientific notation.
- write numbers in standard form.
- compare numbers in scientific notation.

SCIENTIFIC NOTATION

Calvin practiced converting standard notation to scientific notation by completing the 10 problems in the table shown. Unfortunately, his teacher noticed Calvin made mistakes on 7 out of the 10 problems. Find his mistakes and correct them in the second table below.

Directions: Only list the 7 problems that have mistakes in the table below. 3 of the original problems are correct.

STANDARD NOTATION	SCIENTIFIC NOTATION
1) 76,450,000	7.645×10^8
2) 0.000327	3.27×10^4
3) 34,000	3.4×10^4
4) 116,000,000,000	1.16×10^9
5) 0.024	24×10^{-2}
6) 2,800	2.8×10^3
7) 100	1×10^3
8) 0.0000099	9.9×10^{-6}
9) 900,000	9×10^{-5}
10) 0.00633	63.3×10^{-3}



PROBLEM	EXPLAIN CALVIN'S MISTAKE	CORRECTED ANSWER (SCIENTIFIC NOTATION)

Express each number in scientific notation.

1. 9,480,000 = _____	2. 5,100,000,000 = _____
3. 88,000 = _____	4. 670,000,000 = _____
5. 700,000 = _____	6. 104,000,000,000 = _____
7. 9,200,000 = _____	8. 130,000 = _____
9. 24,000,000,000 = _____	10. 650,000 = _____
11. 109,000,000 = _____	12. 30,100,000 = _____

Challenge

Name the least and greatest whole number values for N that will make this inequality true.

$$4.5 \times 10^6 < N < 7.8 \times 10^6$$

The smallest number (on left) is _____ and the largest number (on right) is _____, so N must be between _____ and _____.

Express each number in scientific notation.

1. 630,000 _____	2. 7,000,000 _____	3. 410,000,000 _____
4. 10,430,000,000 _____	5. 87,000 _____	6. 9,200,000,000 _____
7. 27,000 _____	8. 300,000,000,000 _____	9. 741,000,000 _____
10. 1,080,000,000 _____	11. 5,430,000 _____	12. 12,000,000 _____
13. 813,000,000 _____	14. 2,345,000,000 _____	15. 67,000,000,000 _____

Express each number in standard form.

16. 7.5×10^3 _____	17. 9.036×10^5 _____	18. 1.082×10^2 _____
19. 5.6×10^6 _____	20. 3.1×10^7 _____	21. 8.005×10^4 _____