

4.1 - Exploring Scientific Notations

Watch Unit 4 Intro Video

Order the tiles from least to greatest numeric value. Explain how you know your order is correct.

Intro

You can express numbers as products using powers of 10.

Number	Powers of 10	Exponent
5000	5×10^3	3
500	5×10^2	2
50	5×10^1	1
5	5×10^0	0
0.5	5×10^{-1}	-1
0.05	5×10^{-2}	-2
0.005	5×10^{-3}	-3

Example

Look for patterns in the table. Decide whether each statement is true or false.

- a. As the exponent of 10 increases, the number becomes greater. T F
- b. A negative exponent of 10 makes the number negative: a decimal. T F
- c. 5×10^3 is greater than 5×10^2 . T F
- d. 5×10^{-3} is greater than 5×10^{-2} . T F

Number	Powers of 10
5000	5×10^3
500	5×10^2
50	5×10^1
5	5×10^0
0.5	5×10^{-1}
0.05	5×10^{-2}
0.005	5×10^{-3}

Handwritten notes for example c: 5000 and 500 .
 Handwritten notes for example d: 0.005 and 0.05 .

A number in **scientific notation** is written as the product of two factors, one greater than or equal to 1 and less than 10, and the other a power of 10.

Standard Form = 492,000 = Scientific Notation = 6.92×10^5

Got It?

Order the following numbers from least to greatest.

- I. 2.34×10^2 234
- II. 2.34×10^{-2} .0234
- III. 2.34 ||, |||, |

Example

Circle the numbers that are expressed in scientific notation. For the numbers not circled, explain why each is not expressed in scientific notation.

- ~~20×10^3~~ ~~5×10^0~~
- 4×10^{-3} 2.7×10^{120}
- ~~4.22~~ ~~7.5×10^0~~
- ~~10×10^6~~ ~~0.5×10^2~~

Got It?

Which of the following numbers are not expressed in scientific notation?

- I. 1.7×10^7 Yes
- II. 27.3×10^3 NO
- III. 8.04×10^{-2} Yes

WATCH EXAMPLE 3 VIDEO

Example

Match each calculator result with the calculation that produced it. Then write the calculator results in scientific notation.

Got It?

Suppose your calculator display shows $7.7E - 11$. Express this result in scientific notation.