

8th Grade

Lesson 6-1: Scientific Notation

Learning Goal:

- I can write numbers in both standard form and scientific notation.

What I Know:

What I Learned:

base → 5² ← exponent

- Exponential expression - **an expression using a base and an exponent**
- Base - **the number being taken to a power in an exponential expression; the number used as a factor; in the expression, 5^2 , what 5 represents**
- Exponent - **in an exponential expression, it tells the number of times the base is used as a factor**
- Constant - **a term in an expression that does not contain variable**

Scientific Notation

- Scientific notation - a number where the first factor is greater than or equal to one and less than 10 and the second factor is a power of 10

$$1 \times 10^8 \quad 1.54 \times 10^7 \quad 9.99 \times 10^4$$

$1 \leq n < 10$ power of 10

- Standard form - a number not written as a product of factors

Writing in Standard Form From Scientific Notation

The temperature at the sun's core is about 1.55×10^7 degrees Celsius. Write the temperature in standard form.

$$1.55 \times 10^7$$

$$15500000.$$

$$15,500,000 \text{ degrees Celsius.}$$

Quick Check

Write $7.66 \times 10^6 \text{ km}^2$, the area of Australia, in standard form.

$$7.66 \times 10^6 \text{ km}^2$$

~~7,660,000~~

7,660,000 km^2

7,660,000

Writing in Scientific Notation

- Determine the first factor
- Write the second factor as a power of 10

A supercomputer can perform 135,300,000,000,000 operations per second. Write this quantity in scientific notation.

135,300,000,000,000

$$1.353 \times 10^{14}$$

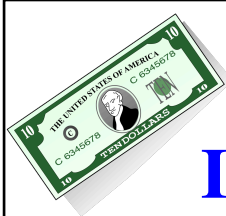
~~1,353,000,000,000,000~~

Quick Check

Write 3,476,000 m, the moon's diameter, in scientific notation.

$$3,476,000\text{m}$$
$$3.476 \times 10^6$$

$$3.476 \times 10^6$$



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\$

If Mrs. Wall win the Mega Millions Lottery this weekend, she will have an estimated $\$2.7 \times 10^6$ to spend on her wonder students. Using standard notation, how much money could she have?



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Assignment

8th Grade Lesson 6-1a

Pgs. 180 #6, 8, 9, 10, 12, 14

Scientific Notation with Negative Exponents

Fingernails grow about 1.23×10^{-2} centimeter per day. Write this rate in standard form.

$$1.23 \times 10^{-2} \text{ cm}$$

$$0.0123$$

$$0.0123 \text{ cm}$$

Quick Check

Write 2.5×10^{-4} inch, the diameter of a cell, in standard form.

$$2.5 \times 10^{-4} \text{ in.}$$

$$0.00025$$

Numbers Less Than 1

Write the quantity 0.0000076 in scientific notation.

$$0.0000076$$

↖

$$7.6 \times 10^{-6}$$

$$7.6 \times 10^6$$

$$7600000$$

Quick Check

Write 0.0000000352 in scientific notation.

0.00000000352

$$3.52 \times 10^{-8}$$

Exit Pass

1. $7.304 \times 10^n = 730.4$
2. $41,700,000,000 = n \times 10^{10}$
3. $3.03 \times 10^n = 0.0000303$
4. $0.00000127 = n \times 10^{-6}$



Assignment

8th Grade Lesson 6-1b

Pgs. 180-181 #16-26 even,
27-32 all