

# Lesson #47 **SCIENTIFIC NOTATION** (day 2)

Scientific notation is a method of expressing very large and very small numbers.

A number in scientific notation can be written as a *product* of a number *greater than or equal to 1 and less than 10*, and a power of 10.

## **SCIENTIFIC NOTATION** → **STANDARD FORM**

### **How To:**

Move the decimal point the same number of places as the number in the exponent.

*Positive exponents move decimal to the right which creates a large number*

*Negative exponents move decimal to the left which creates a small number*

Ex 1: Express  $3.62 \times 10^5$  in standard form.

Ex 2: Express  $8.06 \times 10^{-7}$  in standard form.

Practice: Express the following numbers in standard form.

3)  $4.1 \times 10^3$

4)  $7.02 \times 10^{-4}$

5)  $6.004 \times 10^7$

6)  $8.413 \times 10^6$

7)  $3.002 \times 10^{-5}$

8)  $2.9 \times 10^{-3}$

9) Place each of the following numbers in order from ***greatest to least***.

$10^5$      $10^{-99}$      $10^{-17}$      $10^{14}$      $10^{-5}$      $10^{30}$

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10) The average person takes about  $3 \times 10^4$  breaths per day. Express this number as an integer.

11) On average, Neptune is about  $4.5 \times 10^9$  km from the sun, whereas Mercury is about  $5.7 \times 10^7$  km from the sun. Write both number in standard form and find their combined distance.

Neptune: \_\_\_\_\_

Mercury: \_\_\_\_\_

\_\_\_\_\_

12) Are the following numbers written in scientific notation? *If not, state why.*

a)  $1.87 \times 10^3$

b)  $14.09 \times 10^{-5}$

**Compare using <, >, or =**

Ex 13)  $3.76 \times 10^{-5}$  \_\_\_\_\_  $3.76 \times 10^{-10}$

Ex 14)  $8 \times 10^2$  \_\_\_\_\_  $7 \times 10^3$

Example 15) Order the following numbers from least to greatest:  $6.7 \times 10^{-5}$ ,  $8.2 \times 10^{-5}$ ,  $1.3 \times 10^{-5}$

Example 16) Order the following numbers from least to greatest:  $1.24 \times 10^5$ ,  $7.3 \times 10^{-6}$ ,  $1.1 \times 10^{10}$

**Now, You Try!**

**Compare the following using <, >, or =**

17)  $8.4 \times 10^{-11}$  \_\_\_\_\_  $7.3 \times 10^{-11}$     18)  $6.72 \times 10^3$  \_\_\_\_\_  $9.3 \times 10^3$     19)  $5.4 \times 10^5$  \_\_\_\_\_ 540,000

20)  $8.6 \times 10^{16}$  \_\_\_\_\_  $8.6 \times 10^{12}$     21)  $7.88 \times 10^{-2}$  \_\_\_\_\_  $1.24 \times 10^2$     22)  $3.5 \times 10^6$  \_\_\_\_\_  $5.6 \times 10^3$

**Order the following from Least to Greatest.**

23) $4.2 \times 10^{-7}$ , $3.6 \times 10^{-7}$ , $1.1 \times 10^{-7}$	24) $3.1 \times 10^{10}$ , $1.2 \times 10^{-3}$ , $1.2 \times 10^3$
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25) Which of these numbers is the least?

A)  $8.7 \times 10^6$

B)  $9.35 \times 10^6$

C)  $3.14 \times 10^6$

D)  $2.01 \times 10^6$

26) Which of these numbers is the greatest?

A)  $1.12 \times 10^{-3}$

B)  $3.25 \times 10^{-8}$

C)  $8.76 \times 10^{-10}$

D)  $9.347 \times 10^{-20}$