

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 3.62×10^5 in standard form.

$$3.62000 = 362,000$$

Ex 2: Express 8.06×10^{-7} in standard form.

$$0.000000806$$

Practice: Express the following numbers in standard form.

3) 4.1×10^3

$$4,100$$

4) 7.02×10^{-4}

$$0.000702$$

5) 6.004×10^7

$$60,040,000$$

6) 8.413×10^6

$$8,413,000$$

7) 3.002×10^{-5}

$$.00003002$$

8) 2.9×10^{-3}

$$.0029$$

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

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

~~30000~~ 30,000

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

Neptune: 4,500,000,000

Mercury: 57,000,000

4,557,000,000

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

a) 1.87×10^3

yes.

b) 14.09×10^{-5}

No. 14.09 is bigger than 10.

Compare using <, >, or =

Ex 13) 3.76×10^{-9} > 3.76×10^{-10}

Ex 14) 8×10^2 < 7×10^3

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

1.3×10^{-5} , 6.7×10^{-5} , 8.2×10^{-5}

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

7.3×10^{-6} , 1.24×10^5 , 1.1×10^{10}

Now, You Try!

Compare the following using <, >, or =

17) 8.4×10^{-11} > 7.3×10^{-11} 18) 6.72×10^3 < 9.3×10^3 19) 5.4×10^5 = 540,000

20) 8.6×10^{16} > 8.6×10^{12} 21) 7.88×10^{-2} < 1.24×10^2 22) 3.5×10^6 > 5.6×10^3

Order the following from Least to Greatest.

23) 4.2×10^{-7} , 3.6×10^{-7} , 1.1×10^{-7}

1.1×10^{-7} , 3.6×10^{-7} , 4.2×10^{-7}

24) 3.1×10^{10} , 1.2×10^{-3} , 1.2×10^3

1.2×10^{-3} , 1.2×10^3 , 3.1×10^{10}

25) Which of these numbers is the least?

A) 8.7×10^6

B) 9.35×10^6

C) 3.14×10^6

D) 2.01×10^6

26) Which of these numbers is the greatest?

A) 1.12×10^{-3}

B) 3.25×10^{-8}

C) 8.76×10^{-10}

D) 9.347×10^{-20}