SCIENTIFIC NOTATION

A QUICK WAY TO WRITE

REALLY, REALLY BIG

OR

REALLY, REALLY SMALL NUMBERS.

Mathematicians are lazy!!!

They decided that by using powers of 10, they can create short versions of long numbers.

Rules for Scientific Notation

To be in proper scientific notation the number must be written with

* a number between 1 and 10

* and multiplied by a power of ten

23×10^5 is not in proper scientific notation. Why?

Soooo……

137,000,000 can be rewritten as

$$1.37 \times 10^{8}$$

Now you try.....

Using scientific notation, rewrite the following numbers.

347,000.

3.47×10^5

902,000,000.

9.02×10^8

61,400.

6.14×10^4

Remember, you can use your calculator to change into scientific notation!

Convert these:

1.23×10^5

123,000

6.806×10^6

6,806,000

Try these!

4,000

4×10^3

2.48×10^3

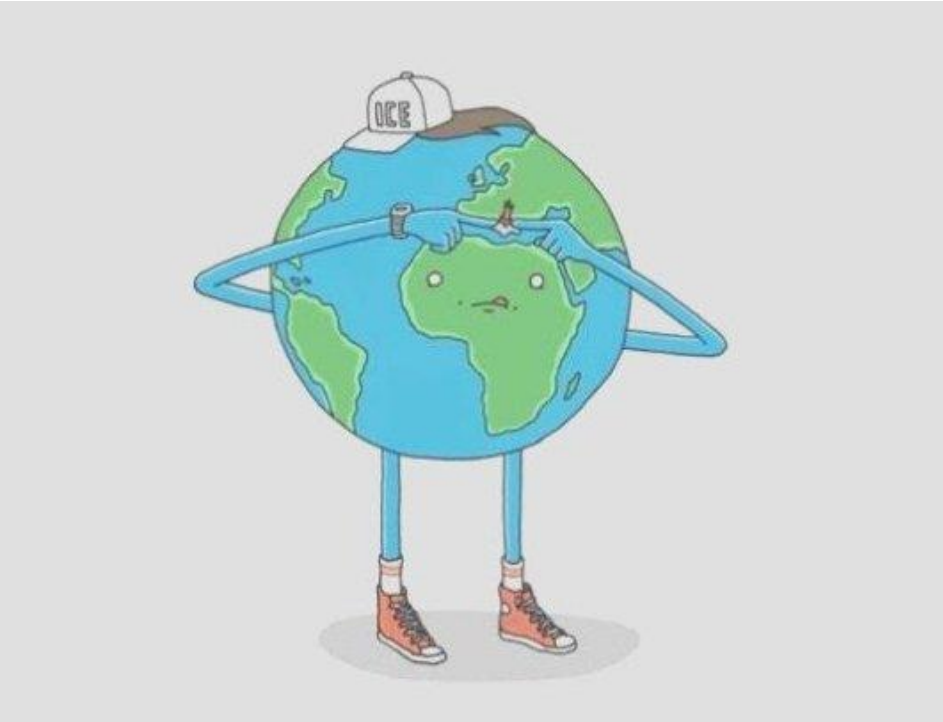
2,480

6.123×10^6

6,123,000

306,000,000

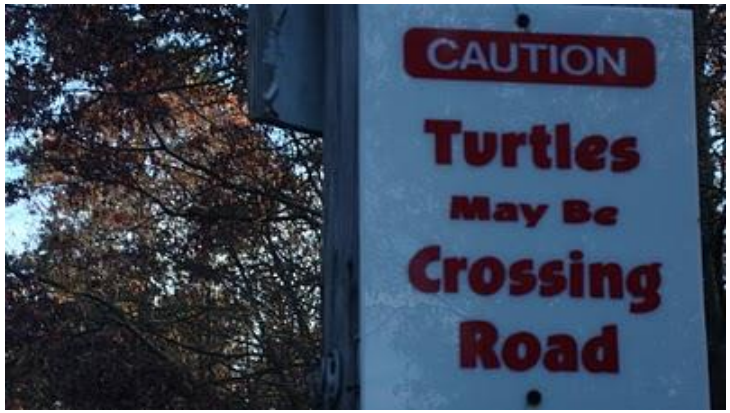
3.06×10^8

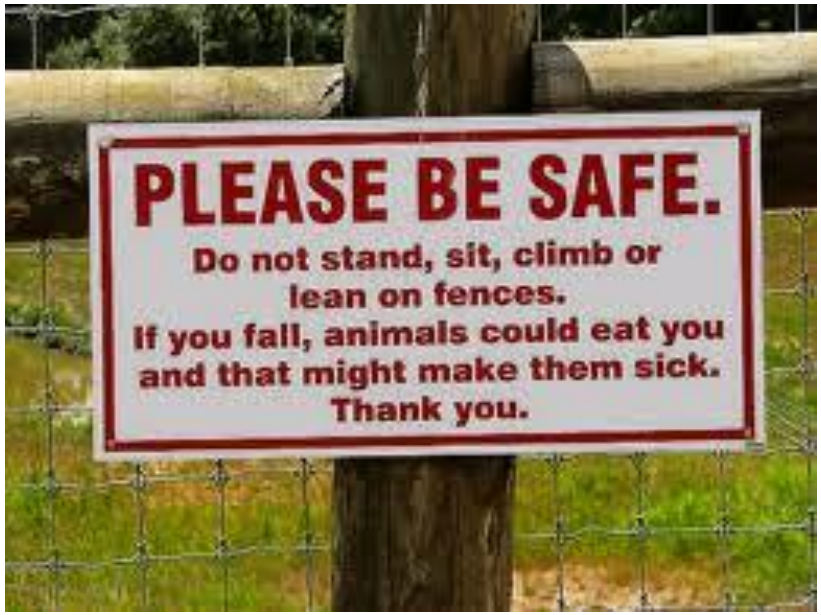


The Earth's mass is about 5973600000000000000000000kg!

It would be simpler to write: 5.9736×1024 kg

- The U.S. has a total of 1.2916×10^7 acres of land reserved for state parks. Write this in standard form.





12,916,000 acres

Why does a negative exponent give us a small number?

$10000 = 10 \times 10 \times 10 \times 10 = 10^4$

$1000 = 10 \times 10 \times 10 = 10^3$

$100 = 10 \times 10 = 10^2$

$10 = 10^1$

$1 = 10^0$

Do you see a pattern?

Soooo....

$$\frac{1}{10} = 10^{-1}$$

$$\frac{1}{100} = \frac{1}{10^2} = 10^{-2}$$

$$\frac{1}{1000} = \frac{1}{10^3} = 10^{-3}$$

$$\frac{1}{10000} = \frac{1}{10^4} = 10^{-4}$$

Your turn.....

Using Scientific Notation, rewrite the following numbers.

0.000882

8.82×10^{-4}

0.00000059

5.9×10^{-7}

0.00004

4×10^{-5}

Remember, you can use your calculator to change into scientific notation!

More examples....

1) 0.0004

4×10^{-4}

2) 1.248×10^{-6}

.000001248

3) 6.123×10^{-5}

.00006123

4) 0.00000306

3.06×10^{-6}

5) 0.000892

8.92×10^{-4}

Remember, you can use your calculator to change into scientific notation!

A red blood cell is about 0.000008 metres long. What is this in scientific notation?

We can also say that a red blood cell is about

8.0×10^{-6} metres long.

A ribosome, another part of a cell, is about 0.000000003 of a meter in diameter. Write the length in scientific notation.

3×10^{-9}

Keep practising!!!