Handling big numbers and working with large quantities

Place value chart for whole numbers

Each digit in a whole number has a **place value**, based on its position from the right, as seen in the following place value chart.

Place value chart

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
1,000,000	100,000	10,000	1,000	100	10	1

The **value of a digit** in the number is the digit itself multiplied by the place value. The following table shows examples to distinguish between the place value of a digit and the value of a digit.

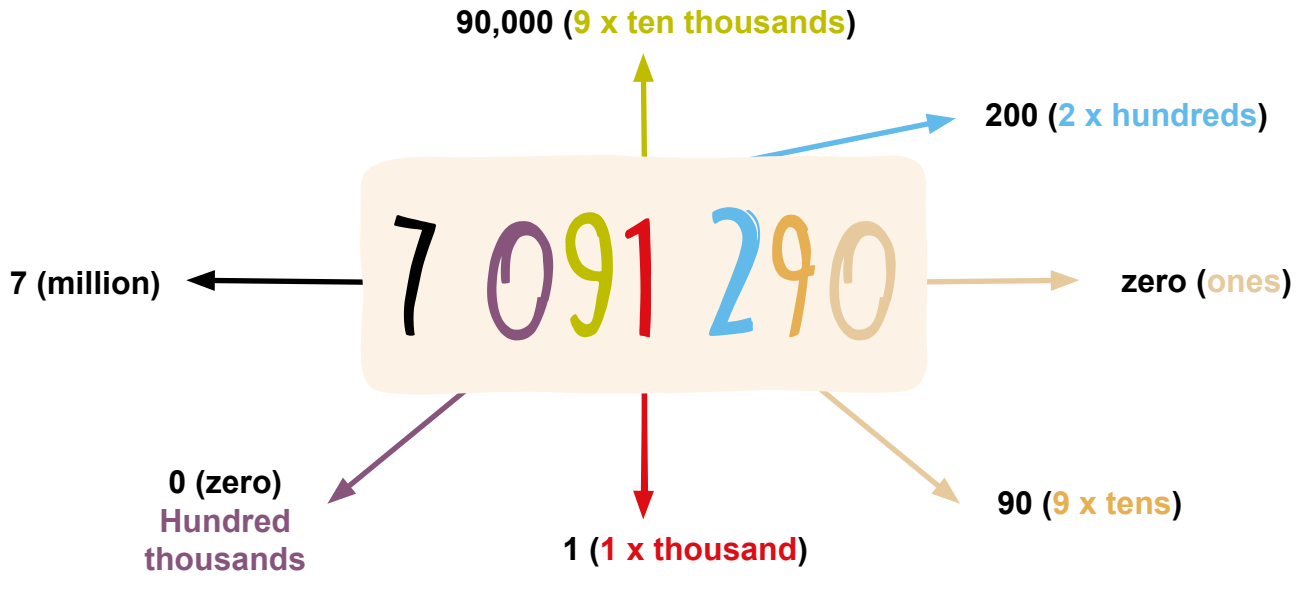
Number	Place Value (of the red digit)	Value of the digit (of the red digit)
1,234	Ones	4
1,234	Tens	30
1,234	Hundreds	200
1,234	Thousands	1,000
7,891,234	Ten Thousand	90,000
7,891,234	Hundred Thousands	800,000
7,891,234	Millions	7,000,000
57,891,234	Ten Millions	50,000,000

We will now think about the **total weight** of 11 major structures found around the world.

Structure	Weight (tonnes)
Airbus A380	277
Statue of Christ the Redeemer	635
Eiffel Tower	7,300
Tokyo Tower	4,000
RMS Titanic	47,070
Container Ship	70,000
Beijing Olympic Stadium	110,000
Empire State Building	331,000
Burj Khalifa	500,000
Golden Gate Bridge	804,700
Great Pyramid, Giza	5,216,308
Total	**7,091,290**

Together these structures weigh approximately 7 Million Tonnes (actually 7 million 910 thousand 290 tonnes).

7,091,290



7 million tonnes is just 10 % (or 1/10th) of the world's annual production of Palm Oil
Try replacing the Airbus A380 with a few endangered animals. Do your research to find the weight of 1 animal, and see how many of these animals you would need to add to replace the plane (that is the equivalent of 277 tonnes).

Using standard form to write large numbers

To convert a number into standard form, split the number into two parts - a number between 1 and 10 multiplied by a power of 10.

$$n \times 10^x$$

n = number bigger than or equal to 1 and less than 10

x = a number that is called the power of 10 (10 to the power 2, written as 10^2, spoken out as 10 to the power 2 (or 10 squared in this case).

In other words, how many times 10 is multiplied by itself. X can be any positive or negative whole number. If its positive you are working with large numbers, if negative small numbers

10^1 =10 (10 x 1)
10^2 = 100 (10 x 10)
10^3 = 1000 (10 x 10 x 10)
10^4 = 10,000
10^5 = 100,000
10^6 = 1,000,000 (million)
10^7 = 10,000,000

So back to our figure 7,091,290, write this number using standard form _____ tonnes.

But remember, that's only 10% of palm oil yield, so the yield is actually 70,091,290 tonnes.

When written using standard form is that

a) **7.09129×10^7** b) **7.09129×10^6** c) **0.709129×10^8** d) **70.9129×10^6**