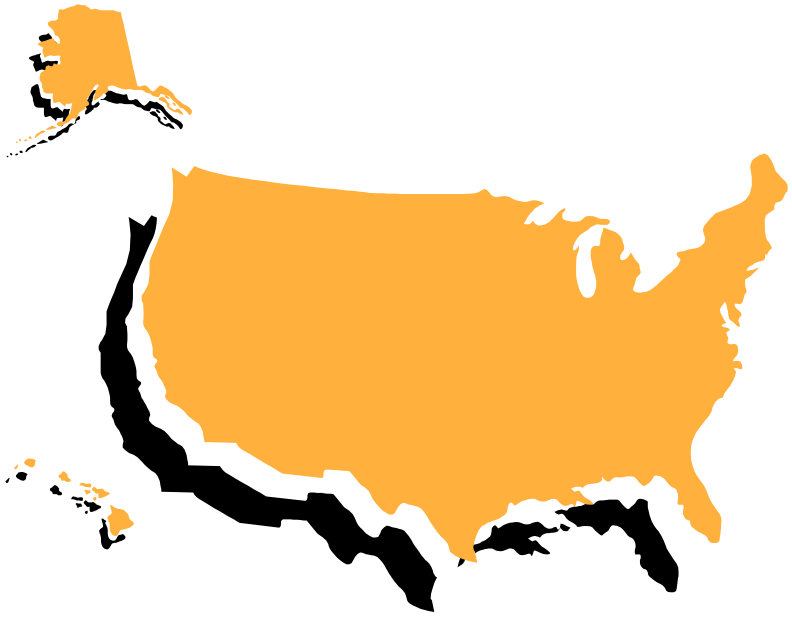
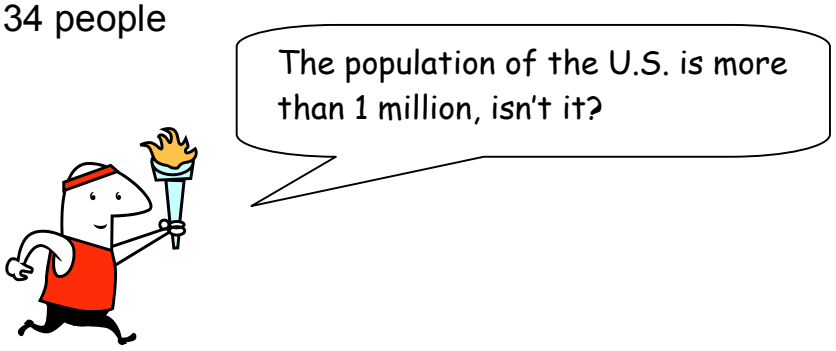
1 Large Numbers



New York City	8,104,079 people
Los Angeles	3,845,541 people
Chicago	2,862,244 people
Houston	2,012,626 people
Philadelphia	1,470,151 people
Phoenix	1,418,041 people
San Diego	1,236,249
U.S.A.	295,734,134 people



Let's investigate the system of large numbers that are greater than 1 million!

1 The System of Large Numbers

➢ Hundred Millions

1. ? The population of the U.S.A. is shown to the right.

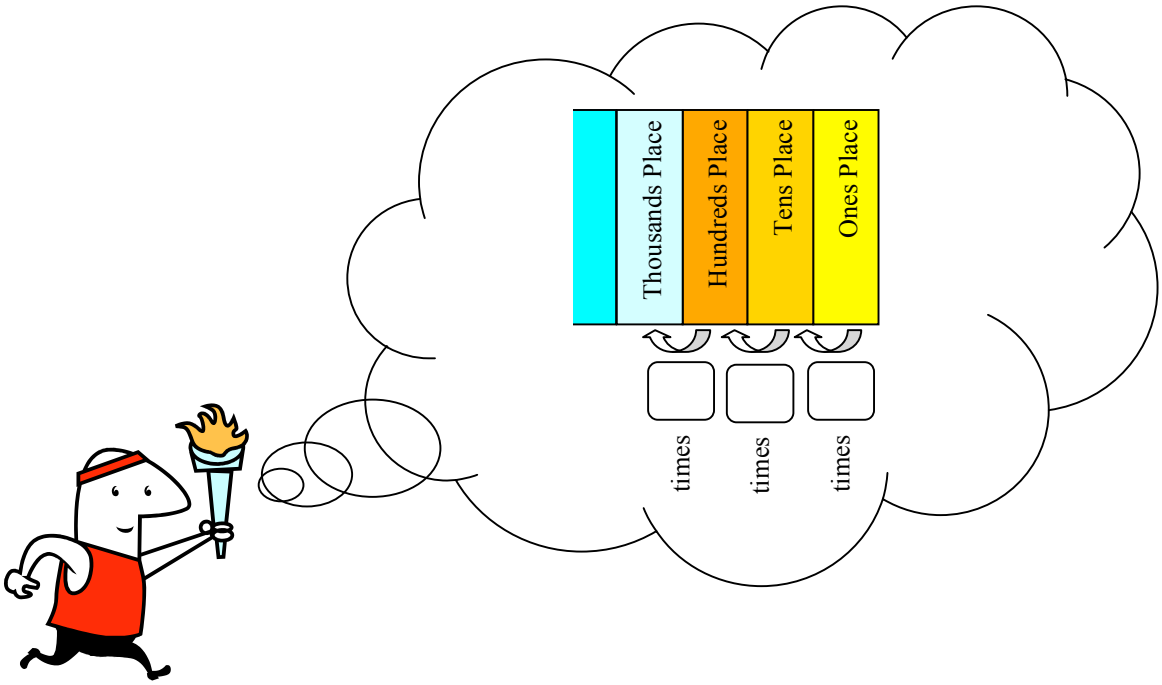
295,734,134

(July 2005)

Let's find out how to read this number!

1 What number is in the millions place?

2 Look at the digit "9" in the place to the left of the millions place.



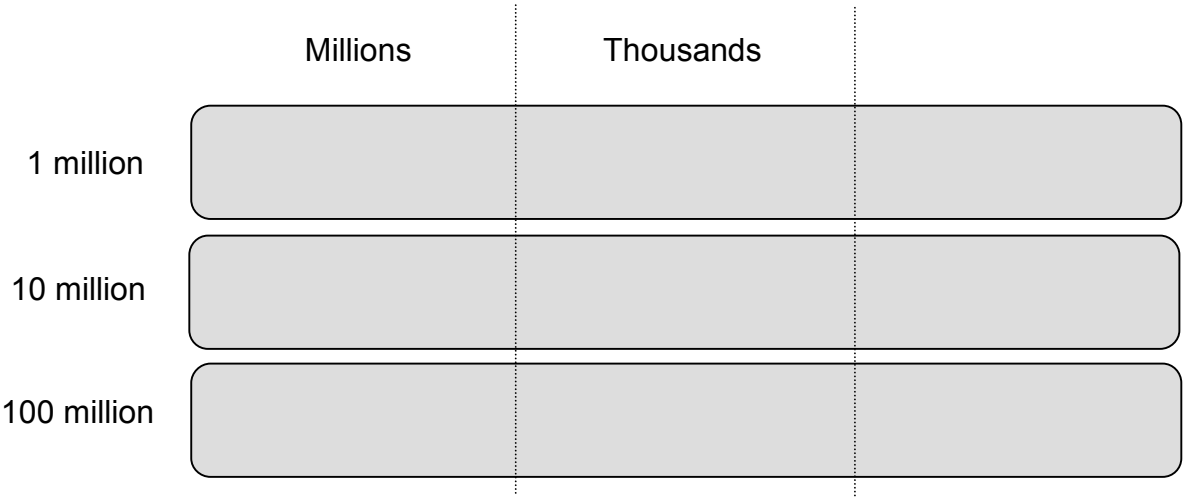
The number that is 10 times as large as 1 million is called **10 million** and it is written as **10,000,000**. Also, the number that is 10 times as large as 10 million is called **100 million**.

2	9	5,	7	3	4,	1	3	4
Hundred Millions Place	Ten Millions Place	Millions Place	Hundred Thousands Place	Ten Thousands Place	Thousands Place	Hundreds Place	Tens Place	Ones Place

3 How many more than 200 million people is the U.S. population?

295,734,134 people is read as “Two hundred ninety-five million, seven hundred thirty-four thousand, one hundred thirty-four” people.

4 Please write the following numbers in the ☐ below.



1) Please read the following numbers.

(1) 13,476,151 (2) 320,601,070

➢ Billions

2. **?** The total estimated value of U.S. exports in 2005 is shown in the box below. Let's think about how to read this number!

927,500,000,000 dollars

The number that is 10 times as large as 100 million is called **1 billion** and it is written as 1,000,000,000.

Also, the number that is 10 times as large as 1 billion is called **10 billion**, and the number that is 10 times as large as 10 billion is called **100 billion**.

9	2	7,	5	0	0,	0	0	0,	0	0	0
Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones
Billions			Millions			Thousands					

1 How many 1 billions and how many 1 millions do you need to make the number above?

! 927,500,000,000 dollars can be read as "Nine hundred twenty-seven billion, five hundred million" dollars.

It's easier to read a large number if you put a comma every 3 places from the right, isn't it?

1) Please read the following numbers.

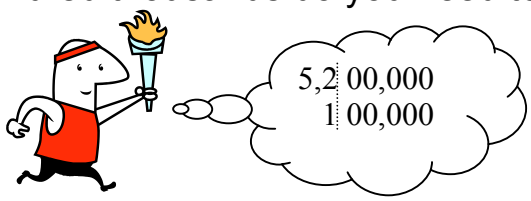
(1) 8,000,560,000 (2) 70,300,430,000

2) Please write the following numbers.

(1) Seven hundred five billion, four hundred ninety-eight million

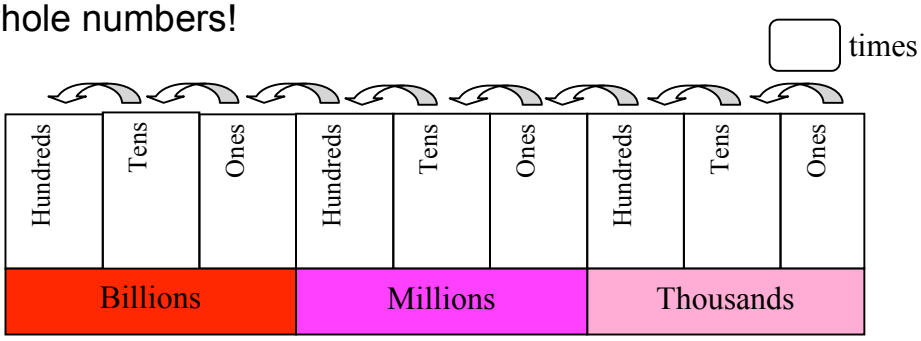
(2) A number that is made up of 3 billions and 75 hundred thousands

3) How many hundred thousands do you need to make 5,200,000?



➢ The System of Whole Numbers

3. **?** Let's look at the table below and investigate the system of whole numbers!

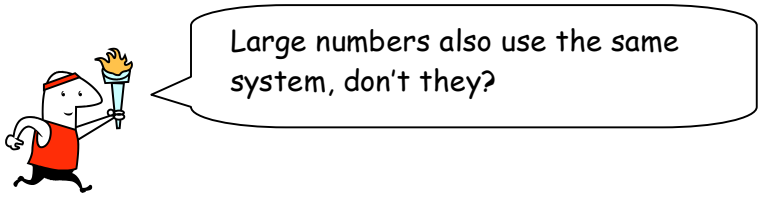


1 Each time you move to the left one place, how many times as large does the new place become?

2 Each time you move to the right one place, how many times as small does the new place become?

3 1 billion is how many times as large is as 100 million?

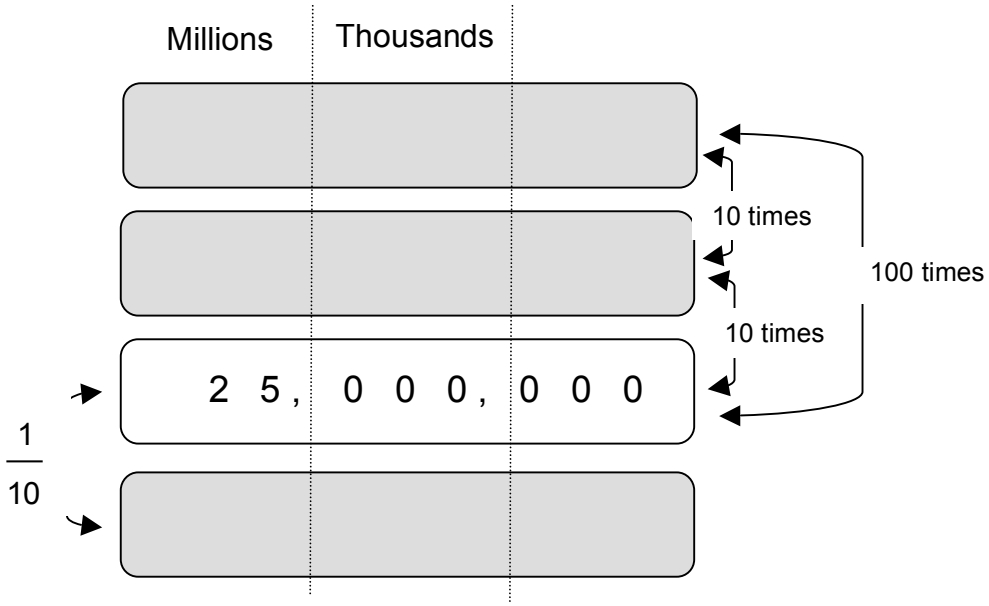
! For any adjacent place in a whole number, the place value to the left is 10 times as large as the place value to the right



➢ Numbers and place values that are 10 times or $\frac{1}{10}$ of a number

4. What numbers are 10 times and 100 times as large as 25 million?

Also, what is $\frac{1}{10}$ of 25 million?



? Let's find out what happens to the digits and their place values when a number is multiplied or divided by 10!

1 When you multiply 25 million by 10, what happens to its digits?

2 When you divide 25 million by 10, what happens to its digits?

! When you multiply a whole number by 10, each digit moves up one place. Also, when you divide a whole number by 10, each digit moves down one place.

1) What numbers are these?

(1) 10 times 70 million

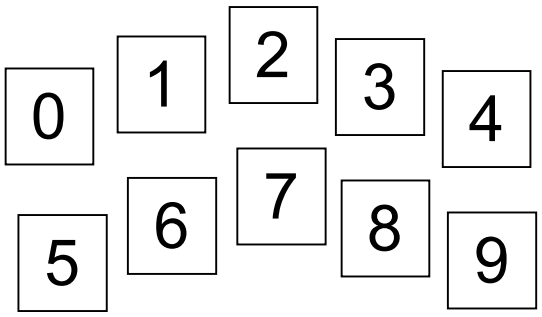
(2) 10 times 500 million

(3) $\frac{1}{10}$ of 80 million

(3) $\frac{1}{10}$ of 3 billion

➢ How to Express Whole Numbers

5. **?** The numbers 0 to 9 are written on cards. Let's make different 10-digit whole numbers! Remember, you can only use each card once!



1 Please make the largest possible number.

2 Please make the smallest possible number.

! You can express any whole number, no matter how large it is, by using these 10 digits: 1, 2, 3, 4, 5, 6, 7, 8, 9 and 0.

The Story of Math

Numbers Larger Than Billions

There are numbers that are larger than numbers in the billions. The number that is 10 times as large as 100 billion is called **1 trillion** and the number periods continue.

Trillions, Quadrillions, Quintillions, Sextillions, Septillions, Octillions, Nonillions, Decillions …

10

10