Numbers to one million

A sign says 304,627 people came to a park. How do you read a number that big, write it, and tell which of two big numbers is greater?

WORDS TO KNOW

Place: the spot a digit sits in, such as the tens place or the ten thousands place.

Period: a group of three places: hundreds, tens and ones. The ones period is on the right, the thousands period on its left.

Expanded form: a sum of what each digit is worth.

$<$ and $>$: "is less than" and "is greater than". The open side faces the greater number.

Value of a digit: the digit times what its place is worth. In 304,627 the 4 is worth 4,000.

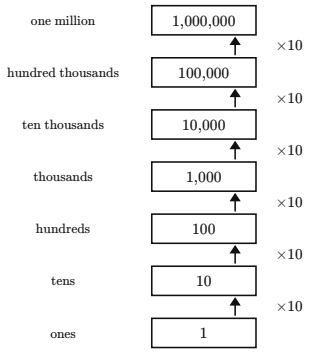
Standard form: the digits, such as 304,627.

Word form: the number written the way you say it.

KEY IDEAS

1. Each place is worth ten times the place to its right

Ten ones make a ten, ten tens make a hundred, and the pattern keeps going. Ten thousands make a ten thousand, ten ten thousands make a hundred thousand, and ten hundred thousands make one million, 1,000,000.



One place to the left: 10 times as much.

Two places to the left: $10 \times 10 = 100$ times as much.

2. Read and write a big number one period at a time

The thousands period is just hundreds, tens and ones again, but counting thousands. Read it like a three-digit number and say "thousand". Then read the ones period. Never say "and".

A comma goes between the periods. Count three digits in from the **right** end.

Every period after the first needs exactly three digits. Write a zero in any place the words skip.

thousands period				ones period		
hundred thousands	ten thousands	thousands	,	hundreds	tens	ones
3	0	4	,	6	2	7

3. Compare from the left

First count the digits. More digits means greater: every six-digit number is at least 100,000, and every five-digit number is at most 99,999.

Same number of digits: line them up on the ones place and read from the left. The first place where the digits differ decides.

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WATCH OUT

- **Do not drop a zero.** Two hundred five thousand, sixty is 205,060. Leave out the first zero and you get 25,060: the 2 slid from the hundred thousands place to the ten thousands place.
- **Count three from the right for the comma.** 85214 is written 85,214, not 852,14.
- **A digit's place decides its value, not the digit alone.** Two 7s in one number can be worth very different amounts.

WORKED EXAMPLES

Example 1. A city has 506,283 people. Write the number in expanded form and in word form.

1. From the right: 3 ones, 8 tens, 2 hundreds, 6 thousands, 0 ten thousands, 5 hundred thousands.
2. Write what each digit is worth. The 0 is worth nothing, so it adds no part.
$$506{,}283 = 500{,}000 + 6{,}000 + 200 + 80 + 3$$
3. The thousands period is 506, "five hundred six", then "thousand". The ones period is 283, "two hundred eighty-three".

Answer: 500,000 + 6,000 + 200 + 80 + 3, and five hundred six thousand, two hundred eighty-three. **Check:** 500,000 + 6,000 = 506,000, and 506,000 + 283 = 506,283.

Example 2. Write seven hundred three thousand, twenty in standard form.

1. The words before "thousand" are seven hundred three, so the thousands period is 703.
2. The words after the comma are twenty: 0 hundreds, 2 tens, 0 ones. The ones period needs three digits, so it is 020.
3. Put a comma between the periods.

Answer: 703,020. Both zeros in 020 are needed to keep the 2 in the tens place.

Example 3. Put 412,375; 421,357; 97,840; and 412,357 in order from least to greatest.

1. Count digits. 97,840 has five digits and the others have six, so it is the least.
2. The six-digit numbers all have 4 hundred thousands. In the ten thousands place the digits are 1, 2 and 1. The 2 is largest, so 421,357 is the greatest.
3. 412,375 and 412,357 match until the tens place: 7 and 5. Since 5 < 7, 412,357 < 412,375.

Answer: 97,840 < 412,357 < 412,375 < 421,357.

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