

Whole Numbers: Place Value

A. Understanding Place Value

Using only the ten digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 we can write an unlimited number of whole numbers because of their place value. The first place value on the right is the **ones** place value.

Moving one place to the left is the **tens** place. To the left of that is the **hundreds** place.

Consider the number 406.

1. The 4 is in the _____ place.
2. The 0 is in the _____ place. 4 0 6
3. The 6 is in the _____ place.

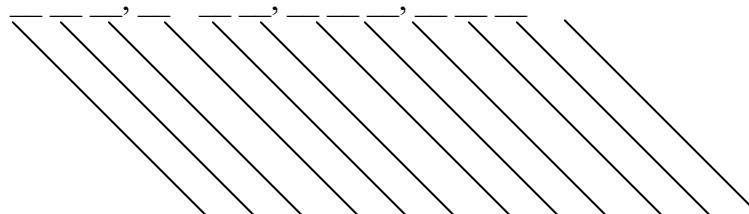
billions, millions, thousands, ones

billions
hundredbillions
tenbillions
hundredmillions
tenmillions
hundredthousands
tenths
ones

Each period's name is written above the three digits in that period. The place values are written below each place. Be sure that you can name periods and the place values. Cover the place values above and fill in the blanks below. Check yourself.

Periods _____

Place
Values



Use the number 75,980,624 to answer:

4. The 7 is in the _____ place.

5. The 9 is in the _____ place.
6. What digit is in the thousands place? _____ 7. What digit is in the ten-thousands place? _____
8. The 6 is in the _____ place.
9. The digit to the immediate **right** of the hundreds place is _____.

B. Reading Numbers Written in Standard Form

The number 406 is read "four hundred six"

- NOTICE:** 1. Neither the zero nor the tens place was mentioned.
 2. We did not say 406 ones (because 406 ones is four hundred six).
 3. The word "AND" was not used.

The number 75,980,624 is read:

"Seventy-five million, nine hundred eighty thousand, six hundred twenty-four."

- NOTICE:** 1. The digits in each period (read as a one, two or three digit number) are followed by the name of the period.
 2. The "ones" period was not named.
 3. The word "AND" was not used.
 4. Period names were used only one time - at the end of that period. Let the comma remind you to say the name of the period.

10. - 13. Write in words how each number is read.

10. 2,407,038 _____

—

11. 130,000,000 _____

—

12. 38,702 _____

13. 517,209,007,050 _____

C. Writing Numbers in Standard Form

When a number is written in words and you wish to write it in standard form, look for the names of the "periods". You will replace these names with commas. There must be three digits in every period except the one on the far left. Use zeros to hold the place of place values not mentioned.

EXAMPLE: Write in standard form:

Twenty MILLION, five hundred twelve THOUSAND, seventeen.

- Look for names of the **periods**: (million, thousand)
- Draw a line under all of the other words (but don't draw a line under the "period" names).

Twenty million, five hundred twelve thousand, seventeen.

- Now write the digits for the underlined numbers and place commas where you see a "period" name.

20,512,017

NOTICE:

- We did not need to write 020 because the period on the far left can have fewer than 3 digits.
 - We had to have the 0 in the hundreds place because there are no hundreds and we need three places. 'Seventeen' is 1 ten and 7 ones. If we write 170, it would be 1 hundred 7 tens and 0 ones or 'one hundred seventy.'
14. - 15. Write in standard form. IF a three digit period is missing, use zeros in each place.
14. Three hundred six million, five hundred thirty thousand, eight.
15. Five billion, seventy-five thousand.

D. Writing Numbers in Expanded Form:

To do this, you must:

- Know place values.
- Write the value of each digit \times its place value.
- Write each of these values as numbers being added.

EXAMPLE: Write 50,208,417 in expanded form.

THINK: $5 \times 10,000,000 = 50,000,000$
 $0 \times 1,000,000 = 0$
 $2 \times 100,000 = 200,000$
 $0 \times 10,000 = 0$
 $8 \times 1,000 = 8,000$
 $4 \times 100 = 400$
 $1 \times 10 = 10$
 $7 \times 1 = 7$

The expanded form is:

$$50,000,000 + 200,000 + 8,000 + 400 + 10 + 7$$

It is not necessary to show the values that are zero!

16. - 17. Write in expanded form:

16. 35,247

17. 800,562,503

ANSWERS:

- A.
1. hundreds
 2. tens
 3. ones
 4. ten millions
 5. hundred thousands
 6. 0
 7. 8
 8. hundreds
 9. 2 (it is in the tens place - just to the right of the hundreds place.)
- B.
10. two million, four hundred seven thousand, thirty-eight
 11. one hundred thirty million (we do not name periods that contain only zeros).
 12. thirty-eight thousand, seven hundred two.
 13. five hundred seventeen billion, two hundred nine million, seven thousand, fifty.

Be sure you didn't use "AND" in 10. - 13.

- C.
14. 306,530,008
 15. 5,000,075,000

It's a good idea to read your number - did you use the same name that the problem gave you?

D. 16. $30,000 + 5,000 + 200 + 40 + 7$

17. $800,000,000 + 500,000 + 60,000 + 2,000 + 500 + 3$