

# Place Value

Palomar College

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## Objectives

- Introduce specific vocabulary.
- Write a number in words.
- Write a number in expanded form.

The **digits** 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 can be used to write numbers. The position of the digit determines its **place value**. This is called the **standard form** of the number. For example, 14, 358, 637, 945.432 is written in standard form.

## Reading a Number in Words

- Read each three digit number between commas and then attach the appropriate word.
- On the left side of the decimal the first comma denotes **thousand**, the second comma denotes **million**, and the third comma denotes **billion**. This is called the **whole number part**.
- The decimal point is read as “and”.
- The numbers to the right of the decimal point are called the **decimal part**. Write the decimal part in words as though it were a whole number followed by the place value of the last digit.

## Expanded Form

- Each digit of a number represents how many of that place value there are.
- The expanded form of a number breaks apart the number into a sum of numbers each with only one nonzero digit.
- For example, the expanded form of 251 is  $200 + 50 + 1$ .

Billions			Millions			Thousands			Ones			.	Decimals					
hundred billions	ten billions	billions	hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones	.	tenths	hundredths	thousandths	ten thousandths	hundred thousandths	millionths
	1	4	3	5	8	6	3	7	9	4	5	.	4	3	2			

14, 358, 637, 945.432 is read as **fourteen billion**, **three hundred fifty-eight million**, **six hundred thirty-seven thousand**, nine hundred forty-five **and four hundred thirty-two thousandths**.

The expanded form of 14, 358, 637, 945.432 is

$$10,000,000,000 + 4,000,000,000 + 300,000,000 + 50,000,000 + 8,000,000 + 600,000 + 30,000 + 7,000 + 900 + 40 + 5 + \frac{4}{10} + \frac{3}{100} + \frac{2}{1000}$$

## Examples of Numbers in Words

- 21, 500, 612 is read as twenty-one *million*, five hundred *thousand*, six hundred twelve.
- 5, 023, 000, 023.7 is read as five *billion*, twenty-three *million*, twenty-three and seven *tenths*.
- 5, 213.034 is read as five *thousand*, two hundred thirteen and thirty-four *thousandths*.

## Examples of Expanded Form

- The expanded form of 6, 721 is  $6000 + 700 + 20 + 1$ .
- The expanded form of 21, 003.7 is  $20,000 + 1,000 + 3 + \frac{7}{10}$ .
- The expanded form of 280, 501.027 is  $200,000 + 80,000 + 500 + 1 + \frac{2}{100} + \frac{7}{1000}$ .

## Let's Try It

Write each number in words.

- 31, 502, 016, 512
- 4, 211.15
- 218, 002.0256

## Let's Try It

Write each number in expanded form.

- 51, 203
- 4, 301.7
- 5, 016, 005.025

## Practice

**Write each number in words.**

- 31, 763, 981
- 5, 678.213
- 1, 000, 001.0045

**Write each number in standard form.**

- fifty million, three hundred five thousand, eleven
- twenty-three thousand, four hundred forty-five and eighty-eight thousandths
- ten thousand, fifty-two and twelve hundredths

**Write each number in expanded form.**

- 21, 506
- 500, 701.578
- 2, 000, 817.034

**Write each number in standard form.**

- $3,000 + 200 + 50 + 4$
- $200 + 5 + \frac{2}{10} + \frac{4}{100}$
- $30,000 + 500 + 7 + \frac{6}{10} + \frac{9}{1000}$

## Tips

- When reading a number only use the word “and” when denoting the decimal point.
- When converting a decimal from words to decimal notation, make sure the last digit is in the correct place by inserting zeros if necessary. For example, five and twenty-three thousandths is 5.023. The last digit 3 must lie in the thousandths place.
- Writing zeros after the the last digit to the right of the decimal point does not change the value of the number.

$$5.8 = 5.80 = 5.800$$

# Place Value

## Answers to Practice

Write each number in words.

- 1) 31,763,981  
thirty-one million, seven hundred sixty-three thousand, nine hundred eighty-one
- 2) 5,678.213  
five thousand, six hundred seventy-eight and two hundred thirteen thousandths
- 3) 1,000,001.0045  
one million, one and forty-five ten thousandths

Write each number in standard form.

- 4) fifty million, three hundred five thousand, eleven  
50,535,011
- 5) twenty-three thousand, four hundred forty-five and eighty-eight thousandths  
23,445.088
- 6) ten thousand, fifty-two and twelve hundredths  
10,052.12

Write each number in expanded form.

- 7) 21,506  
 $20,000 + 1,000 + 500 + 6$
- 8) 500,701.578  
 $500,000 + 700 + 1 + \frac{5}{10} + \frac{7}{100} + \frac{8}{1000}$
- 9) 2,000,817.034  
 $2,000,000 + 800 + 10 + 7 + \frac{3}{100} + \frac{4}{1000}$

Write each number in standard form.

- 10)  $3,000 + 200 + 50 + 4$   
3,254
- 11)  $200 + 5 + \frac{2}{10} + \frac{4}{100}$   
205.24
- 12)  $30,000 + 500 + 7 + \frac{6}{10} + \frac{9}{1000}$   
30,507.609