

Name: \_\_\_\_\_

## Place Value and Base Ten

### Place Value:

Our number system is a *place value* system. We have only ten digits, 0 through 9. But with just these ten digits, we can express any whole number no matter how large it is.

The reason we can do this is because the *value* of each digit in whatever number we are talking about depends upon its *place* in the number.

In the number 462, the digit 4 stands for 4 hundreds because it is in the hundreds place. The digit 6 stands for 6 tens because it is in the tens place. And the digit 2 stands for 2 ones because it is in the ones place.

### Base Ten:

Our number system is based on the number 10. We say that it is a base ten number system.

Thousands	Hundreds	Tens	Ones
1,000	100	10	1

Each place in our number system has a value that goes with it.

The value of the ones place is 1.

The value of the tens place is 10.

The value of the hundreds place is 100.

The value of the thousands place is 1000.

Etc...

*Each place in our number system has a value that is 10 times the value of the place directly to its right.* This is why we say that our system is a base 10 system.

The value of the tens place (10) is 10 times the value of the ones place (1).

The value of the hundreds place (100) is 10 times the value of the tens place (10).

The value of the thousands place (1000) is ten times the value of the hundreds place (100).

*Each digit in a number has a value that goes with it. The value of a digit in a place value number system is equal to the digit times the value of its place:*

A 6 in the ones place has a value equal to  $6 \times 1 = 6$ .

A 6 in the tens place has a value equal to  $6 \times 10 = 60$ .

A 6 in the hundreds place has a value equal to  $6 \times 100 = 600$ .

A 6 in the thousands place has a value equal to  $6 \times 1000 = 6000$ .

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## Place Value and Base Ten

Let's take a look at the number 462.

The digit 4 is in the hundreds place.

The hundreds place has a value of 100.

The digit 4 in 462 has a value equal to  $4 \times 100 = 400$ .

The digit 6 in 462 is in the tens place.

The tens place has a value of 10.

The digit 6 in 462 has a value of  $6 \times 10 = 60$ .

The digit 2 in 462 is in the ones place.

The ones place has a value of 1.

The digit 2 in 462 has a value of  $2 \times 1 = 2$ .

When we write a number in expanded form we are writing it as the sum of the values of its digits. The number 462 can be written in expanded form as  $400 + 60 + 2$ .

The value of any digit in any place is 10 times the value it would have if it were in the place directly to the right of the place it's in.

For example, the value of a 3 in the hundreds place is 10 times the value of a 3 in the tens place.

1. What is the value of the underlined digit? (**Remember**—the value of a digit is a number.)

123

678

333

345

333

333

2. The value of a 7 in the hundreds place is \_\_\_\_\_ times the value of a 7 in the tens place.
3. The value of a 5 in the tens place is \_\_\_\_\_ times the value of a 5 in the ones place.
4. The value of 9 in 903 is \_\_\_\_\_ times the value of 9 in 390.