



## Estimating a Difference by Rounding

After studying this lesson, you will understand rounding basics. You'll also learn how to quickly solve subtraction problems by using your rounding skills.

### Rounding Numbers Can Be Helpful

In math and in real life, you will come across many problems where you need to find the difference. For instance, when you go shopping and you use a coupon for \$10 off your purchase of \$50 or more, in order to find out your total amount due, you need to find the difference. You need to subtract the \$10 from the amount that you are purchasing. So difference problems are really just subtraction problems.

Many times, you do want to be exact and use the numbers you are given to find an exact answer, but sometimes, **rounding**, replacing a number with an approximate simpler number, can give you a general idea of what kind of exact answer to get, a so-called rough estimate. This helps you a lot when you are out shopping. If you can round your numbers and quickly get an estimate of your exact answer, you won't be surprised at the register when the final purchase price is given to you. You will already know that it will be close to your estimated - your rounded - answer.

Do you remember how to round? You pick how much you want to round to. You can pick tens, hundreds, thousands, and so on. Or you can pick to a certain decimal point, like two decimal points, three decimal points and so on. Either way, once you have chosen how much to round to, you will then look at the number directly to the right of the digit you chose to round to. If it is 5 or higher, then you round your digit up, and if it is less than 5, then you round down by keeping the digit you are rounding and bringing all the numbers to the right of that digit to 0.

For example, rounding the number 16 to the tens place gives you 20. You round up because the number directly to the right of the digit that you are rounding - the 6, which is directly to the right of the 1 in the tens place - is 5 or greater. The 1 in the tens place changes to a 2. If our number is 13, then we round down by keeping our tens digit, the 1, and bringing the 3 down to get 0. We get 10.

Let's look at a couple of examples.

## Example 1

You are shopping at the store where you have the \$10 off coupon for purchases of \$50 or more. Right now, all the things you have in your cart add up to \$87.24. Use rounding to help you estimate what kind of a total to expect at the register.

This problem is a difference or subtraction problem. It wants you to subtract the \$10 from your current total. So we are essentially performing the subtraction  $\$87.24 - \$10$ . The problem wants us to round. But how much do we round to? Well, since the problem didn't specify how much to round to, it is up to us. Since we have a \$10 coupon and our current total has a tens digit, we will round to the tens place.

The \$10 is already rounded to the tens for us. The \$87.24 needs to be rounded. We follow our rules and look at the digit directly to the right of the digit we are rounding to, the 7. Is this digit 5 or greater? Yes, so we round up. We get \$90. Our subtraction problem now becomes  $\$90 - \$10$ . Isn't this a very simple problem you can easily and quickly do in your head? This is the beauty of rounding. Our rounded answer is \$80. We can expect to pay around \$80 at the cash register.

## Example 2

Estimate  $456 - 240$ . Round to the hundreds.

In this problem, it actually tells us how much to round. That makes our job easier. Rounding 456 to the hundreds gives us 500, since our digit to the right of the hundreds place is a 5 (5 or greater). Rounding 240 to the hundreds gives us 200, since our digit to the right of the hundreds place is a 4 (less than 5). Now all we have to do is to subtract our rounded numbers,  $500 - 200$ . Can you do this easily? That's right, it equals 300. Our rounded answer is 300. We can expect our exact answer to be around 300.

## Lesson Summary

Now, let's review what we've learned. We learned that **rounding**, replacing a number with an approximate simpler number, can be a quick and easy way to get an estimate of your subtraction problem. It lets you know what number your exact answer should be around. To round, we use the 5 or greater than 5 rule. If the digit to the right of the digit we are rounding to is 5 or greater, then we round up. But if the digit is less than 5, then we round down by keeping the digit we are rounding and bringing all the digits to the right of that digit to 0.

# Learning Outcome

After watching this lesson, you should be able to apply the concept of rounding numbers to make subtraction problems much easier to solve.