



How to Solve Word Problems That Use Percents

100 percent of percent problems can be solved if we follow the correct steps. In this lesson, we'll practice solving a variety of different percent problems.

Percent Word Problems

Meet Ashley. Here's Ashley's house.

It's what you might call a fixer upper. She could definitely use some help.

In this lesson, we're not going to help Ashley redo her floors or paint, but we will help her with some percent word problems. These problems are about as common as the termites in Ashley's walls. What? She didn't know there were termites. Oh no.

Well, while she fumigates, let's talk about how to solve these problems. First, the word **percent** just means per hundred. If you have 100 nails, 50% of that is 50 nails. If you have 8 paint brushes, 50% is 4 brushes. To figure this out, we can set up a simple equation: $50/100 = x/8$. 50% is the same as 50/100.

In a percent word problem, we follow a few steps. First, read the entire problem. Makes sense, right? Next, identify the question. We can't solve it if we don't know what it's asking.



Meet Ashley and see her house.

Third, identify the relevant details. This can be the tricky part. We're looking for a few key things. We might see a percent, which is identified with this symbol (%), unless that's what we're trying to find out. There might be a whole or a part. A whole is the original number. In our paint brush example, 8 is our whole. This is also sometimes called the base. 4 is our part; that's part of the whole, or base.

It's important that we figure out what's what so we can get to step four - solve the problem. As we'll see, there are often different, equally effective ways to solve percent problems. It's like fixing a leaky pipe. As long as you make it stop leaking, it doesn't matter if you solder in a new section or just put gum on it. Well, ok, gum isn't a long-term fix. But in percent problems, you may have multiple options.

Finding the Percent

Alright, time to help Ashley. She's retiling a bathroom and she runs into this problem: A bathroom requires 470 tiles. If Ashley has 355 tiles, what percent of the bathroom tiling can she complete?

Let's think about our steps. We read the problem. And what's the question? We're trying to find the percent of the bathroom she can tile. What details do we know? We know the whole; that's 470. That's the total number of tiles she should have. We also know the part: 355.

How do we solve it? There are a few different ways, but let's try an easy one to remember. Let's compare the part to the whole, so we have $355/470 = x/100$. Here, x is the percent of the tiles. 100 would be all the tiles, which is 470. To figure out what x is, just cross multiply. So $470x = 35,500$. Divide by 470, and $x = 75.5\%$. That's our answer!

Sadly, that doesn't cover the walls with tiles. But at least Ashley knows how much coverage she'll have.

Finding the Part

In that problem, we found the percent. What if we need to find the part? Ashley's at the hardware store and she encounters this: A table saw's original price is \$250. If it's on sale for 15% off, what is the sale price?

This time, we want to find the part. The sale price is going to be a part of the whole price, which is \$250. We know the percent: 15. But be careful. The saw is 15% off, so the part we're trying to find is 85% of the whole.

Ok, with that in mind, we could set up two fractions again, but there's another, simpler method. Let's convert 85% to a decimal. To do that, we just drop the sign and move the decimal point two places to the left. So it becomes .85. Now we can multiply .85 times the whole, 250. That gets us \$212.50. So our sale price is \$212.50.

Finding the Whole

Ashley was psyched to find a deal on a table saw. She hopes to also score a deal on some drywall. She needs a lot, and here's what she learns: A hardware store has 30% of its drywall on display, with the rest stored in the warehouse. If 72 panels are on display, how many in total are available?

We're trying to find the total number of drywall panels. So we want the whole. We know the part: 72 panels. And we know the part is 30% of the whole.

Let's try a new method. We can call the whole x . We know the 30% times x is 72. In other words, whatever x is, 72 is 30% of that. If we turn 30% into a decimal, our equation looks like this: $72 = .30x$. Now we divide by .30, and we get $x = 240$. So the store has 240 drywall panels, including those on display and in the warehouse. That'll cover a lot of wall!

Percent Change

Let's try one more kind of percent problem. This one involves some electrical work. Sparky the electrician originally said his labor would cost \$525 but now says it'll cost \$610. By what percent did the cost increase?

Before we can find the percent increase, we need to find the change in dollars. $610 - 525$ is 85. So Sparky's charging \$85 more. We can find the percent with a little division. To find percent change, divide the absolute change by the original. This works for increases or decreases.

Here, our original price is 525, and our difference is 85. 85 divided by 525 is .16. If we convert that to a percent, it's 16%. So \$525 to \$610 is a 16% increase. Let's hope Sparky spends that money on some safety equipment.

Lesson Summary

To summarize, we learned about solving percent word problems. Percent just means per hundred.

When we solve these word problems, we follow four steps. First, read the problem. Next, identify the question. Third, identify the relevant details. This includes looking for things like the percent in question, the whole and the part. Finally, solve the problem.

We looked at different ways of solving these problems, including setting up two fractions, converting percents to decimals and using a variable to stand in for our missing number. And maybe, just maybe, we helped Ashley fix her house. It's got to be at least, what, 5% better?

Learning Outcomes

Following this lesson, you'll have the ability to:

- List the four steps that will help you solve percent word problems
- Solve percent word problems by setting up fractions, converting percents to decimals and using variables