General Education Mathematics
Class Notes
Consumer Math: Percents, and Taxes (Section 8.1)

Percents are used every day. Understanding them will help you use them correctly.

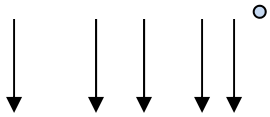
Your city is considering a sales tax of 9%. What does that mean? If your favorite store has a 30%-off sale, can you afford that sweater you've been eyeing? Percents surround us so let's start off with a solid understanding.

"Percent" means "per 100" or "part of 100"

For example, 20% means "20 parts out of every 100 parts". We could write 20% as $\frac{20}{100}$ or .20 (if we do that division).

Do you remember the shortcut for turning percents into decimals?

expl 1: What number is 16% of 70?



These problems can usually be directly translated.

Percent problems compare parts to the whole. Imagine you have a whole 70 dollars or meters or frogs or whatever. And, 16% of that 70 (or 11.2 dollars, meters, frogs, etc.) would be a **part of that whole**. The trick is to figure out what is the part and what is the whole in these problems.

$$percent = part/whole$$
or
$$percent \cdot whole = part$$

Alternatively,
$$\frac{percent\ number}{100} = \frac{part}{whole}$$

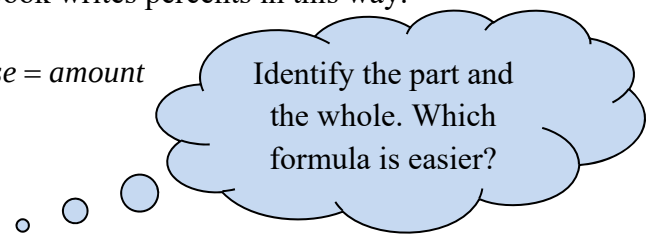
expl 2: The number 45 is 25% of what number?

Identify the part and the whole. Perhaps, use x to make an equation.

Check yourself! Does your answer make sense?

Different sources will use different words. The book writes percents in this way.

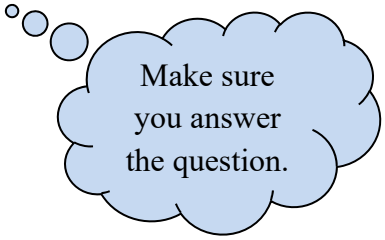
$$percent = amount/base \quad \text{or} \quad percent \cdot base = amount$$



expl 3: The number 14.8 is what percent of 60? Round the decimal to three decimal places so that the percent form is to the nearest tenth of a percent. Give answer in percent form.

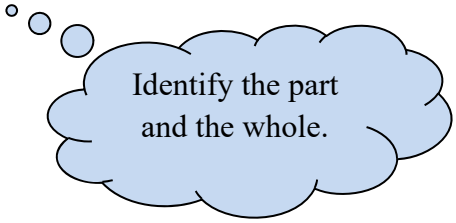
expl 4: Solve. Round to the nearest cent.

A music store is advertising a 25%-off sale. Find the discount and sales price of a CD that sells regularly for $13.



expl 5: Solve. Round to the nearest whole percent.

The cost of attending a private college rose from $19,000 in 2000 to $22,200 in 2006. Find the percent increase.



On the next page, we will see a formula for this.

Percent of Change Formula:

$$\text{percent of change} = \frac{\text{new amount} - \text{base amount}}{\text{base amount}}$$

To find the percent that something increased or decreased, the key is to know what the whole, or base amount, is. What is the bottom number? The base amount should be the amount that was true *before* the increase or decrease happened.

Federal Income Taxes:

We will be figuring how much someone owes in federal income taxes. For these problems, you will be given a table that will give you instructions on how to calculate a person's tax.

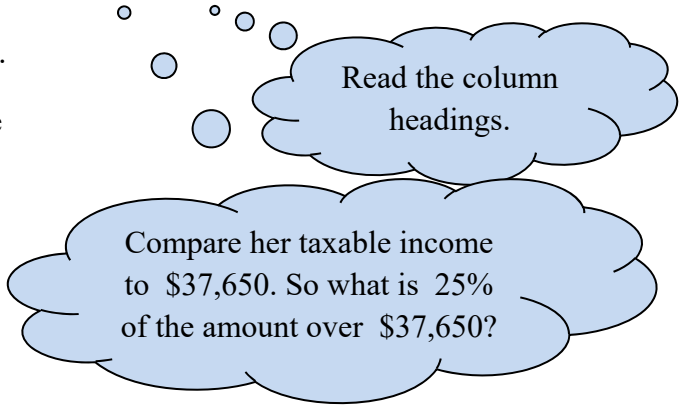
This table is taken from the instructions for filling out Form 1040 to compute the federal income tax for a person whose marriage status is single.

	If taxable income is over —	But not over —	The tax is	Of the amount over —
Line 1	$0	$9,275	$0 + 10%	$0
Line 2	9,275	37,650	927.50 + 15%	9,275
Line 3	37,650	91,150	5,183.75 + 25%	37,650
Line 4	91,150	190,150	18,558.75 + 28%	91,150
Line 5	190,150	413,350	46,278.75 + 33%	190,150
Line 6	413,350	415,050	119,934.75 + 35%	413,350
Line 7	415,050	—	120,529.75 + 39.6%	415,050

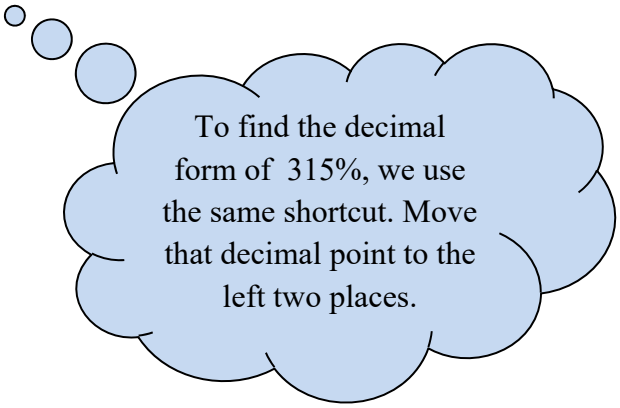
Line 3 (highlighted above) shows the calculation needed to compute the income tax for a (single) person whose taxable income is over $37,650 (column 1) but *not* over $91,150 (column 2). Columns 3 and 4 read, "The tax is $5,183.75 + 25% Of the amount over $37,650."

Let's do example 6 to show how we interpret this.

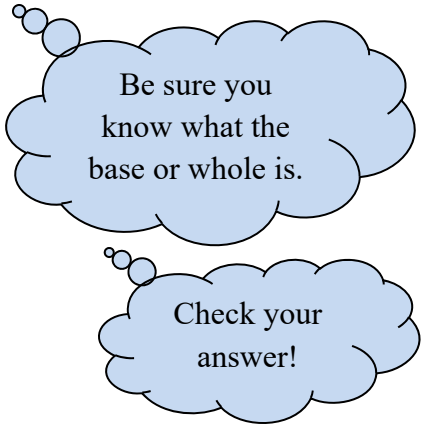
expl 6: Maxine is single and has a taxable income of $65,000. Find the tax she owes.



expl 7: When Leroy bought his house, he paid $35,000. Four decades later, when he sold it, the house had increased in value 315%. What was it worth when he sold?



expl 8: Ned's Necessities has a 10%-off sale on toilet paper. Karen buys a package for $23. How much was the original price? Round to two decimal places and include a dollar sign.



expl 9: A certain company used to sell a two-quart (64 ounces) bin of ice cream for $4.35. They now sell a 1½-quarts (48 ounces) bin for $4.00. Is their ice cream actually cheaper? Find the percent of increase *or* decrease *per ounce*.