# Writing Decimals and Fractions as Percents

Earlier you learned to write equivalent fractions.

a. $\frac{3}{20} = \frac{?}{100}$

$\frac{3}{20} \times \frac{5}{5} = \frac{15}{100}$

$\frac{5}{5} = 1$, so $\frac{3}{20} \times \frac{5}{5}$ does not change the value.
Remember the Multiplication Property of One.

b. Simplify $\frac{18}{200}$

$\frac{\overset{1}{\cancel{2}} \cdot 9}{\underset{1}{\cancel{2}} \cdot 100}$

$\frac{2}{2} = 1$, so canceling common factors does not change the value

$\frac{9}{100}$

In an earlier chapter, you learned that $\frac{15}{100}$ can be written as 15%. You also know that $\frac{15}{100}$ has a decimal value of .15 or 0.15. If you understand that a percent tells how many parts out of 100 parts, it is easy to know $\frac{9}{100}$ is 9% and .09 is 9%.

Later in your text, you will learn how to write any fraction or decimal as a percent.

You will use two things learned earlier.

1. A number × one = that same number.
   (Refer to the Multiplication Property of One in your text.)
2. 100% = $100 \times \frac{1}{100} = \frac{100}{100} = 1$

| In other words, multiplying a number by 100% does not change the value because 100% is a name for one. |
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↑
Know this

Let's look at the numbers we used at the beginning of this lab.

$\frac{3}{20} \times 100\%$

$= \frac{3}{\cancel{20}_{1}} \times \cancel{100\%}^{5}$ NOTICE 100% is $\frac{100\%}{1}$ because $100 = \frac{100}{1}$

$= 15\%$

Also $0.15 \times 100\% = 15\%$

$\frac{18}{200} \times 100\% = \frac{18}{\cancel{200}_{2}} \times \cancel{100\%}^{1} = 9\%$

Also $0.09 \times 100\% = 9\%$

To write the percent value of any number (fraction, decimal or whole number), multiply that number by 100%. The answer must include the % symbol!

| EXAMPLES: | Write as a percent: |
|---|---|
| a. 0.075 | $0.075 \times 100\% = 7.5\%$ |
| b. $\frac{5}{6}$ | $\frac{5}{6} \times \frac{100\%}{1} = \frac{500\%}{6} = 83\frac{1}{3}\%$ |
| c. $\frac{1}{300}$ | $\frac{1}{300} \times 100\% = \frac{1}{300} \times \frac{100\%}{1} = \frac{1}{3}\%$ |
| d. 1.9 | $1.9 \times 100\% = 190\%$ |
| e. 0.002 | $0.002 \times 100\% = 0.2\%$ |

**NOTICE** In d, 1.9>1, so its percent value is more than 100%. In c. and e, $\frac{1}{300} < \frac{1}{100}$ and 0.002 < 0.01, so their percent values are less than 1%.

The other values are less than 100% but more than 1%. PAY ATTENTION to these relative values. You will catch careless errors this way!

1-10. Write as a percent.

1. $\frac{3}{5}$

2. 0.06

3. $\frac{7}{25}$

4. 0.003

5. $\frac{1}{200}$

6. 6

7. 1.595

8. 0.327

9. $\frac{5}{9}$ Answer can be rounded to the nearest tenth of a percent. This will be an approximate value of $\frac{5}{9}$

10. $\frac{3}{16}$ Answer with remainder written in fractional form. This is the exact value of $\frac{3}{16}$

There is a short cut to writing decimals as percents. LOOK at the answers to 2, 4, 6, 7 and 8 above. Think how the problem's decimal point was changed. What also changed?

2. 0.06 = 6%
4. 0.003 = 0.3%
6. 6 = 600%
7. 1.595 = 159.5%
8. 0.327 = 32.7%

NOTICE that the decimal point is moved two places to the right and the % sign is attached. You may use this short cut to change from a decimal to a percent if you understand it. Do not get it confused with changing from a percent to a decimal.

Why does this work?

Refer to your text. Doesn't multiplying a number by 100 move its decimal point 2 places to the right? (100 × number changes the value, but 100% = 1 so attaching the % after moving the decimal point two places to the right is a short cut for multiplying the number by 100% ( a name for 1).

<u>BE SURE YOU KNOW WHEN TO USE 100%</u> and when to use $\frac{1}{100}$.

If you multiply by 100%, your answer will become a <u>percent</u>. It will now start out as a percent, but will have the % only in the answer.

When the problem already is a percent, that "%" is replaced with $\frac{1}{100}$ and multiplied if you want the fraction value. The answer will no longer have the "%" symbol. Similarly if the problem is a percent and you need to know its decimal value, replace the "%" with 0.01 and multiply. Again, the "%" will not be in the answer.

Be sure you can write the percent name for any fraction decimal or whole number.

Also be sure you know how to write a given percent as a fraction, decimal or whole number.

The worksheet, "**Commonly Used Percents and Fractions** " will help you to understand percents. Knowing these values will allow you to work quickly when those percents are used, and it will also enable you to estimate answers before you do the work and to check to see if answers are reasonable after your work is done!

Answer 11-17.

11. What is the value of 100%

12. Write the Multiplication Property of One.

13. A. How can you find the percent value of a number?
    B. Why does this not change the value of the number?

14. What is the percent value of one?

15. What is the percent value of a number greater than 1?

16. What is the percent value of a number less than 1?

17. If the value of a number is less than 0.01, its percent value will be less than _____%.

ANSWERS:

1. 60%
2. 6%
3. 28%
4. 0.3%
5. $\frac{1}{2}\%$
6. 600%
7. 159.5%
8. 32.7%
9. 55.6% (rounded from 55.55…%)
10. $18\frac{3}{4}\%$
11. 1
12. A number × 1 = that number
13. A. Multiply the number by 100%
    B. 100% = 1, and multiplying by 1 does not change the value
14. 100%
15. More than 100%
16. Less than 100%
17. 1%

It would be helpful to you if you would write the answers to 11-17 in complete sentences! Writing helps you learn! Try it!