Math 7: Week of May 11th

Lesson 12: Fractions, Decimals & Percents
Lesson 16: Solving Percents Using Proportions

Targets:
  #1 Convert between fractions, decimals and percents.
  #2 Find the percent of a number using proportions.
  #3 Find a missing number using proportions with percents.

Directions:
- Go through the slides (notes) and work through the examples on a separate piece of paper.
- Complete the practice problems on a separate piece of paper.
- Check your answers with the key given at the end of the lesson.
- Check Google Classroom for the schedule of online help sessions.

Vocabulary

Percent: A ratio that compares a number to 100.

Write Percents as Fractions and Decimals

- ⬜ **Percent as a fraction:** Write the value of the percent in the numerator of the fraction and 100 in the denominator. Write the fraction in simplest form.

- ⬜ **Percent as a decimal:** Write it as a fraction and then convert the fraction to a decimal using division.

Example 1

Write each percent as a fraction __and__ a decimal.

a. 25%
1. Convert to a fraction and simplify. $\dfrac{25}{100} = \dfrac{1}{4}$

2. Convert to a decimal.
                                                $1 \div 4 = 0.25$
     Answer: $25\% = \dfrac{1}{4} = 0.25$

b. 88%
1. Convert to a fraction and simplify. $\dfrac{88}{100} = \dfrac{22}{25}$

2. Convert to a decimal. $22 \div 25 = 0.88$

     Answer: $88\% = \dfrac{22}{25} = 0.88$

Example 2

Write each decimal as a percent.

a. 0.65

   Multiply by 100 $0.65 \cdot 100 = 65$
   Write with % symbol.   **65%**

b. 0.5

   Multiply by 100 $0.5 \cdot 100 = 50$
   Write with % symbol.   **50%**

Example 3

Write each fraction as a percent.

a. $\dfrac{2}{5}$ Convert to a decimal. $2 \div 5 = 0.4$
             Multiply by 100. $0.4 \cdot 100 = 40$
             Write with % symbol.   40%

       $\dfrac{2}{5} = 40\%$

b. $\dfrac{1}{3}$
        Convert to a decimal. $1 \div 3 = 0.\overline{3}$
        Multiply by 100.
        Write with % symbol. $0.\overline{3} \cdot 100 = 33.\overline{3}$
                                        $33.\overline{3}\%$

    $\dfrac{1}{3} = 33.\overline{3}\%$

Use this diagram to help convert!
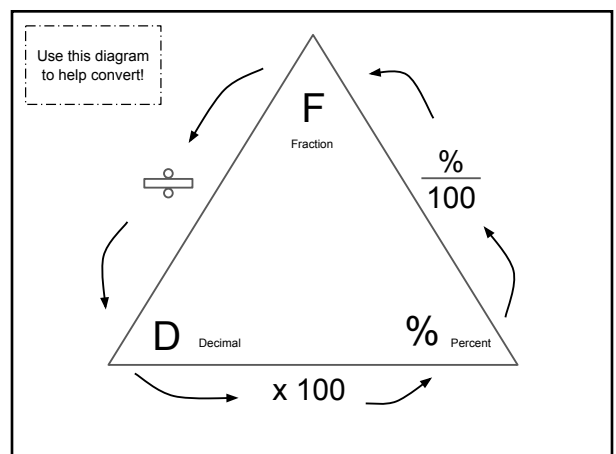
Practice~ *Lesson 12:* Fractions, Decimals & Percents

Write each percent as a <u>fraction</u> in simplest form. Write each as a <u>decimal</u>.

1. 75% **2.** 12% **3.** 20% **4.** 95% **5.** 160%

Write each decimal as a <u>percent</u>.

6. 0.01 **7.** 0.4 **8.** 0.5 **9.** 0.35 **10.** 1.25

Write each fraction as a <u>percent</u>.

11. $\frac{24}{100}$ **12.** $\frac{9}{10}$ **13.** $\frac{3}{4}$ **14.** $\frac{2}{3}$ **15.** $\frac{7}{8}$

Solve Percent Problems Using Proportions

To find the percent, part or whole value for numbers in a percent problem:

1. Write the percent as a ratio.

2. Write the ratio for the part of a number to its whole value.

3. Write a proportion using the ratios from **Steps 1 and 2**.

4. Solve the proportion. $\dfrac{percent}{100} = \dfrac{part}{whole}$

Key words:

$\dfrac{percent}{100} = \dfrac{is}{of}$

Example 1

<u>What is</u> 24% of 75?

1. Write the proportion.

$$\frac{24}{100} = \frac{x}{75}$$

2. Solve the proportion.

$$\frac{100x}{100} = \frac{1800}{100} \qquad \frac{24 \cdot 75}{100}$$
$$x = 18 \qquad x = 18$$

<u>18</u> is 24% of 75.

Example 2

Thirty-one is 62% <u>of what number</u>?

1. Write the proportion.

$$\frac{62}{100} = \frac{31}{x}$$

2. Solve the proportion.

$$\frac{62x}{62} = \frac{3100}{62} \qquad \frac{31 \cdot 100}{62}$$
$$x = 50 \qquad x = 50$$

31 is 62% of <u>50</u>.

Example 3

<u>What percent</u> of 40 is 18?

1. Write the proportion.

$$\frac{x}{100} = \frac{18}{40}$$

2. Solve the proportion

$$\frac{1800}{40} = \frac{40x}{40} \qquad \frac{18 \cdot 100}{40}$$
$$45 = x \qquad 45 = x$$

<u>45%</u> of 40 is 18.

Example 4

In 2006, people over the age of 65 made up 13% of the population in Oregon. The total population was approximately 3,700,000. Find the number of people over 65.

1. Write a proportion.

$$\frac{13}{100} = \frac{x}{3,700,000}$$

2. Solve the proportion

$$\frac{13 \cdot 3,700,000}{100} \qquad x = 481,000$$

There were approximately 481,000 people over 65.

Practice~ *Lesson 16:* Solving Percents Using Proportions

Use a proportion to solve. Round your answer to the nearest tenth if necessary.

1. What is 30% of 90?

2. One is 2% of what number?

3. What percent of 200 is 68?

4. What is 40% of 55?

5. Sixteen is 64% of what number?

6. What percent of 120 is 24?

7. What percent of 45 is 30?

8. What is 10% of 350?

9. What is 150% of 80?

10. Seventy is 40% of what number?

11. A middle school in Eugene wanted to collect 4,000 pounds of food for the can food drive. So far, they have collected 72% of their goal. How many pounds of food has the school collected?

Practice Answers:

Check your work!

Answers Provided Here!

If you're stuck, ASK! Help sessions are provided each week. Check Google Classroom for dates and times.

Lesson 12

1. $\frac{3}{4}$; 0.75
2. $\frac{3}{25}$; 0.12
3. $\frac{1}{5}$; 0.2
4. $\frac{19}{20}$; 0.95
5. $1\frac{3}{5}$; 1.6
6. 1%
7. 40%
8. 50%
9. 35%
10. 125%
11. 24%
12. 90%
13. 75%
14. 66.6%
15. 87.5%

Worksheet 16

1. 27
2. 50
3. 34%
4. 22
5. 25
6. 20%
7. 66.7%
8. 35
9. 120
10. 175
11. 2,880 pounds

FINAL SLIDE FOR MATH 7!