Activity: Selected Assignments from the May Optional Work Packet

Week: May 18 – May 22

Grade 6

Class Math

Teachers: Ms. Carter, Mr. Dedrick, Ms. Hartley
Ms. K. Ross, Mr. Reed

Key Content/Modeling:
Pearson Topic 6: Understand and Use Percents

- Estimate to Find Percent
- Find the Percent of a Number
- Find the Whole Given a Part and a Percent

You Try:
- Try-It
- Do You Understand?
- Do You Know How?
- Practice

Show me what you know (Proof of learning):
Complete your work and e-mail pictures (or solutions) to your teachers.

Self-Assessment:
Did I complete all of the tasks?
Did I try my best?

Priority Standard(s):
6.RP.A Understand ratio concepts and use ratio reasoning to solve problems.
6.RP.A.3c Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

What am I learning?
I can use percents to represent numbers and parts of numbers.

How do I know I learned?
Learning Evidence in 1-3 Descriptors
I fully completed all tasks and checked my answers to make sure they made sense to answer the questions.

Extra Learning Opportunities: Find some math in your community! Did you use ratio reasoning for cooking? Did you have to add or subtract decimals when you were shopping? Did you find any ratios in your video games? Tell us about what you’ve found on e-mail; we’d love to hear all about it!
Good Morning Students

Monday May 18, 2020

Today Focus:

- In the May 2020 Family Resource Packet
- Resource Packet Link:

Learning Target:

- Make Sense of Problems and Persevere in Solving Them
- Construct Viable Arguments
- Model with Mathematics

Special Note:

- Read each example and do your best in completing all work. If you have any questions, are stuck on a problem, or want me to check your work, please email me and I will be sure to get back with you.
- Take a picture of your work and send it via email for all feedback.
- If you are having trouble accessing the resource packet, please let me know so I can work on ways of getting it to you.
- Paper copies of the resource packet are available to pick up at First Creek on Tuesdays and Thursdays at lunch time.

Tips & Hints:

- Read the entire problem before beginning to work to an answer.
- What do you know about each problem?
- What’s unknown about each problem (what are you trying to discover)?
- Can you draw a diagram (or picture) to help understand the problem?
- https://youtu.be/rR95Cbcjzus (Math Antics - Finding the Percent of a Number)
- https://youtu.be/Uf-R1le2I4Q (Math Antics - What Percent is it?)
- https://youtu.be/HxEQxS0QSwg (Math Antics - Percents: Missing Totals)
The following pages can also be accessed through your Pearson account

6-4 Estimate to Find Percent

**KEY CONCEPT**

Fraction equivalents, rounding, or compatible numbers can be used to estimate the percent of a number.

\[ 8\% \approx 10\% \text{ and } 10\% = \frac{1}{10} \]

\[ \frac{8\% \times 300,000}{10} = 30,000 \]

\[ 27\% \approx 25\% \text{ and } 25\% = \frac{1}{4} \]

300 is a compatible number for 297.

\[ \frac{27\% \times 300}{4} = 75 \]

*New Math Symbol*

\[ \approx \text{ Means “approximately equal to” - this symbol means that the two sides of it are almost the same.} \]

For example: \[ 18.99 \approx 19 \]

6-4 Example 1

**EXAMPLE 1** Represent Percents

What percent of people prefer Bright White Toothpaste?

A **percent** is a rate in which the first term is compared to 100. The percent is the number of hundredths that represents the part of the whole.

**Model with Math**

Decimal grids, number lines, or equivalent fractions can be used to represent percents.

**ONE WAY** Use a grid to represent the percent.

\[ \frac{7}{10} = \frac{70}{100} = 70\% \]

You can use the % symbol to represent percent.

**ANOTHER WAY** Use number lines to represent the percent.

\[ \frac{7}{10} \text{ is equivalent to } \frac{70}{100} \]

\[ \frac{70}{100} = \frac{700}{1000} = 70\% \]

Percent is always compared to 100.

**ANOTHER WAY** Use an equivalent fraction to find the percent.

Multiply both the numerator and the denominator by 10.

\[ \frac{7}{10} \times 10 = \frac{70}{100} \]

\[ \frac{70}{100} = 70\% \]

70% of people prefer Bright White Toothpaste.
Try It!

Jane won 9 out of the 10 video games she played. What percent of the video games did Jane win?

Convince Me! When using an equivalent fraction to find a percent, why do you write 100 as the denominator?

6-4 Example 2

Examine Percents and Wholes

Each line segment represents 100%, but the segments are not the same length. Use equivalent rates to find the percent, or part, of each line segment that points A and B represent.

Point A is at \( \frac{1}{2} \) of the line segment. Point B is at \( \frac{1}{4} \) of the line segment.

Point A = 50%

\[
\frac{1 \times 50}{2 \times 50} = \frac{50}{100} = 50\
\]

2 \( \times 50 = 100 \), so multiply the numerator and the denominator by 50.

Point B = 25%

\[
\frac{1 \times 25}{4 \times 25} = \frac{25}{100} = 25\%\
\]

4 \( \times 25 = 100 \), so multiply the numerator and the denominator by 25.

Try It!

Which point represents 50% on the second line segment? Explain.
### Example 3

You can use percent and mental math to find the length of a line segment.

**A.** If $CD$ represents 10%, what is the length of a line segment that is 100%?

$$
\begin{array}{c}
C & D \\
\text{4 in.} \\
\end{array}
$$

100% is $10 \times 10\%$, so the length of the line segment is $10 \times 4$ inches, or 40 inches.

**B.** If $EF$ represents 200%, what is the length of a line segment that is 100%?

$$
\begin{array}{c}
E & F \\
\text{6 in.} \\
\end{array}
$$

100% is $\frac{1}{2}$ of 200%, so the length of the line segment is $\frac{1}{2}$ of 6 inches, or 3 inches.

### Try It!

If $CD$ represents 100%, what is the length of a line segment that is 25%? Explain.

### Do You Understand?

1. **Essential Question:** How can you estimate to find the percent of a number?

2. Is there more than one fraction you could use to estimate 27% of 200? Explain.

3. What compatible number could you use to estimate 75% of 35? Why is this number compatible with 75%?

4. **Use Structure:** Out of 195 students, 9% have hazel eyes. How can you estimate the number of students with hazel eyes? **MP3**

### Do You Know How?

In 5–8, estimate the percent of each number.

5. 47% of 77

$$
\begin{array}{c}
47\% \wedge \? \wedge 77 \wedge \?
\\
of \wedge \? = \?
\end{array}
$$

6. 18% of 48

$$
\begin{array}{c}
18\% \wedge \? \wedge 48 \wedge \?
\\
of \wedge \? = \?
\end{array}
$$

7. 73% of 800

8. 31% of 94

9. Tara sent party invitations to 98 people. Eighty-two percent of the people said they will come to the party. About how many people said they will come to the party? Explain.
Quick Review
Fraction equivalents, rounding, or compatible numbers can be used to estimate the percent of a number.

Example
Estimate 24% of 83.
24% ≈ 25% and 25% = \( \frac{1}{4} \)
83 rounds to 80.
\( \frac{1}{4} \times 80 = 20 \)
24% of 83 is about 20.

Practice
In 1–6, estimate the percent of each number.

1. 22% of 96
2. 38% of 58
3. 9% of 89
4. 76% of 41
5. 48% of 71
6. 27% of 62

7. Joanna wants to buy a backpack that costs $37.98. The sales tax rate is 8.75%. Estimate the amount of sales tax that Joanna will pay.
6-5 Find the Percent of a Number

**KEY CONCEPT**

Percent equations have a part, a whole, and a percent. You can use the equation to solve for the part, the whole, or the percent.

Find the Part:
What is 12% of 6.75?

\[
x = 0.12 \times 6.75
\]

\[
x = 0.81
\]

12% of 6.75 is 0.81.

Find the Percent:
What percent of 6.75 is 0.81?

\[
p \times 6.75 = 0.81
\]

\[
6.75p = 0.81
\]

\[
p = \frac{0.81}{6.75} = 0.12
\]

12% of 6.75 is 0.81.

If you have two of the three pieces of “part,” “whole,” and “percent;” you can write an algebraic equation to find the missing piece.

- Convert the percentage into a decimal or fraction.
  - 80% = \( \frac{80}{100} = .80 \)
  - 80% = \( \frac{4}{5} = .8 \)
- Part = Whole \( \times \) Percent
Example 1

The fourth, fifth, and sixth graders at Great Oaks School are taking a field trip. Of the 575 students attending the field trip, how many are sixth graders?

Make Sense and Persist The percents in the circle graph sum to 100%, which represents 575 total students, or the whole.

Use a double number line diagram and benchmark fraction equivalents to estimate 36% of 575.

36% ≈ 33 1/3% = 1/3 and 575 ≈ 600

Number

Percent

0 200 600

0 1 100%

36% of 575 is about 1/3 of 600.

About 200 sixth graders are attending.

Use the decimal form of a percent to find 36% of 575.

The decimal form of 36% is 0.36.

0.36 × 575 = 207

You can also use a calculator.

Enter: 0.36 × 575

Display: 207

207 is close to 200.
The answer is reasonable.

There are 207 sixth graders attending the field trip.

Try It!

Suppose 68% of the students attending the field trip were boys. How can you use the double number line diagram above to find the number of boys and to check whether your answer is reasonable?

Convince Me! In finding the percent of a number, when might you want to use the fraction form of the percent instead of the decimal form?
6-5 Example 2

D’wayne plans to wallpaper 72.5% of a 60-square-foot wall. How many square feet of the wall does D’wayne plan to wallpaper? Find 72.5% of 60.

Write an equation.

\[ x = 0.725 \times 60 \]
\[ x = 43.5 \]

So, 43.5 is 72.5% of 60.

D’wayne plans to wallpaper 43.5 square feet.

Try It!

What is 0.8% of 35?

6-5 Example 3

What percent of 92 is 11.5?

Write an equation.

\[ p \times 92 = 11.5 \]
\[ 92p = 11.5 \]
\[ p = \frac{11.5}{92} \]
\[ p = 0.125 \text{ or } 12.5\% \]

So, 11.5 is 12.5% of 92.

Try It!

What percent of 120 is 72?
Do You Understand?

1. **Essential Question** How can you find percents?

2. Describe the equation you use to find the unknown part in a percent problem.

3. Describe the equation you use to find the percent value in a percent problem.

4. **Be Precise** In the expression 34% of 60, what operation does the word “of” mean?

5. **Use Appropriate Tools** How can you use a calculator to find what percent of 180 is 108?

Do You Know How?

6. What is 28% of 50?

7. What is 2.1% of 60?

8. What percent of 315 is 126?

9. What percent of 120 is 28.8?

10. An electronics company has 450 employees. The company plans to increase its staff by 30%. How many new employees will the company hire?

11. The original price of a computer game is $45. The price is marked down by $18. What percent of the original price is the markdown?

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**LESSON 6-5 Find the Percent of a Number**

**Quick Review**

Percent equations have a percent value, a whole, and a part.

**Example**

What is 16% of 73.5?

Let \( x = \) the unknown part.

\[ x = 0.16 \times 73.5 \]

\[ x = 11.76 \]

16% of 73.5 is 11.76.

What percent of 22 is 9.35?

Let \( p = \) the percent value.

\[ 22p = 9.35 \]

\[ \frac{22p}{22} = \frac{9.35}{22} \]

\[ p = 0.425 = 42.5\% \]

42.5% of 22 is 9.35.

**Practice**

Find each part or percent.

1. 9% of 124

2. What percent of 20 is 3?

3. 24% of 35

4. What percent of 110 is 71.5?

5. 43% of 82

6. What percent of 30 is 24?

7. On Tuesday, 620 students attended a middle school. A survey showed that 341 students brought lunch to school that day. What percent of the students brought their lunches?
6-6 Find the Whole Given a Part and a Percent

**KEY CONCEPT**

You can use a double number line diagram or an equation to find the whole when the percent and a part are known.

Use a diagram.

<table>
<thead>
<tr>
<th>0%</th>
<th>100%</th>
<th>150%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>n</td>
<td>12</td>
</tr>
</tbody>
</table>

Each mark represents an increase of 2.

150% of 8 is 12.

**Example 1**

**Find the Whole in a Percent Problem**

Bree scored 90% on her math test. Out of the total possible points on the test, her score was 135 points. How many points were possible on the test?

**Model with Math**

Have you ever wondered how to find the total possible points on a test?

- **ONE WAY** Use a double number line diagram to find the total possible points.
- **ANOTHER WAY** Use an equation to find the total possible points.

Think: 90% of what number is 135?

- **ONE WAY**
  - Bree scored 135 points, which was 90%.
  - Each mark on the line represents 15 points.
  - Add to find the total possible points, \( p \) :
    \[
    135 + 15 = 150
    \]
  - There were 150 total possible points on the test.
- **ANOTHER WAY**
  - 90% of what number is 135?
  - Let \( p \) = the total number of possible points.
  - 90% of \( p \) = 135
  - \( 0.90p = 135 \)
  - Solve the equation:
    \[
    p = \frac{135}{0.90} = 150
    \]
  - Write 90% as a decimal.
  - There were 150 total possible points on the test.

**Reminder** When writing out an equation:

- **of** means multiply
- **is** means equals
- Always convert the percentage into a fraction or decimal.

“25% of what number is 125?” Becomes “0.25 \times n = 125”
Try It!

Bree took another math test and scored 152 points, which was 95% of the total possible points on the test. What was the total number of possible points?

Convince Me! How could you use a double number line diagram to check your answer?

6-6 Example 2

D’wayne plans to wallpaper 72.5% of a 60-square-foot wall. How many square feet of the wall does D’wayne plan to wallpaper? Find 72.5% of 60.

Model with Math You can use a double number line diagram to help write an equation to find the part in a percent problem. 

Write an equation.

\[ x = 0.725 \times 60 \]

\[ x = 43.5 \]

So, 43.5 is 72.5% of 60.

D’wayne plans to wallpaper 43.5 square feet.

Try It!

What is 0.8% of 35?
**6-6 Example 3**

**EXAMPLE 3**  
**Find the Percent**

What percent of 92 is 11.5?

Write an equation.

\[ p \times 92 = 11.5 \]
\[ 92p = 11.5 \]
\[ p = \frac{11.5}{92} \]

\[ p = 0.125 \text{ or } 12.5\% \]

So, 11.5 is 12.5\% of 92.

**Model with Math**  
You can use a double number line diagram to help write an equation to find the percent of a number.  

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**Try It!**

What percent of 120 is 72?

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**Do You Understand?**

1. **Essential Question**  
   How can you find the whole in a percent problem?

2. When you write an equation for a problem such as 300\% of what number is 180, what do you use to represent the phrase ‘what number’?

3. When you find the whole in a percent problem in which the percent is greater than 100\%, is the whole less than or greater than the part?

4. **Be Precise**  
   Tony participated in 6 races, or 10\% of the events. Do the 6 races represent the part, the percent, or the whole? Tell what the others represent.  

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**Do You Know How?**

5. 40\% of what number is 80?

6. 300\% of what number is 90?

7. 70\% of what number is 112?

8. 35\% of what number is 28?

9. 7.5\% of what number is 15?
Quick Review
You can use an equation or a double number line diagram to find the whole when given the part and the percent.

Example
80% of what number is 96?
Let \( n \) = the whole. Write an equation, rename the percent as a decimal, and solve for \( n \).

\[
80\% \cdot n = 96 \\
0.8n = 96 \\
\frac{0.8n}{0.8} = \frac{96}{0.8} \\
n = 120
\]

80% of 120 is 96.

Practice
Find each whole.

1. 140% of what number is 308?

2. 62% of what number is 186?

3. 80% of what number is 120?

4. 40% of what number is 10?

5. Desmond paid 8.5% sales tax when he bought a new phone. The sales tax was $12.75. What was the total cost of the phone, including tax?