

LESSON 10: Percent of Change

Warm-Up

Directions: Solve the following percent problems.

1. What is 10% of 90?
2. What is 25% of 200?
3. 14 is 10% of what number?
4. 24 is 30% of what number?
5. 20 is what percent of 25?
6. 32 is what percent of 128?

LESSON 10: Percent of Change

Directions: Complete the following SOLVE problem with your teacher.

Matthew was trying to earn money for his sister's birthday. The first week he mowed 1 lawn and earned \$10. The second week he picked up two more lawns, mowing 3 lawns total and earning a total of \$30 that week. What is the difference in the amount of money he earned from Week 1 to Week 2?

S Underline the question.

This problem is asking me to find _____
_____.

O Identify the facts.

Eliminate the unnecessary facts.
List the necessary facts.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

Is your answer reasonable? (Compare your answer to the estimate.)

Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

Let's now extend our problem.

2. What other words could you use to describe the word difference?

3. In your own words explain what the following mean:

a. Increase:

b. Decrease:

4. When amounts change, they can increase or decrease. Look at the examples on the next page, decide if the change is an increase or a decrease, and how much of a change it is.

LESSON 10: Percent of Change

Directions: Complete this page with your teacher and partner.

- a. A local neighborhood watch program reported that since they began the program, car break-ins have gone from 5 per month to 1 per month in their neighborhood.
 - b. The population of Mt. Holly, North Carolina, in 2000, was about 9,600 residents. In 2008, the population was about 10,100.
 - c. A pair of boots normally sells for \$89.00. They are on sale for \$50.00.
 - d. In 1996, the minimum wage was \$4.75. In 2009, the minimum wage was \$7.25.
5. Take a look at the graphic organizer below. Use the questions below it to help you fill it in. Use the SOLVE problem from S98 to answer the questions.

Money Earned Week 1	Money Earned Week 2	Difference Between Weeks	Increase or Decrease	Ratio of Difference to What Happened First Week	Express Ratio as a Decimal	Write the Ratio as a Percent

- a. How much money was earned during Week 1?
 - b. How much money was earned during Week 2?
 - c. What is the difference that was earned between each week?
 - d. Is it an increase or decrease?
 - e. What is the ratio of the difference of what Matthew earned between each week to the amount he earned the first week?
 - f. Express the ratio as a decimal.
 - g. Change the decimal to a percent.
6. Let's summarize:
- a. Explain what the ratio you created tells us.
 - b. How did you find that change as a percent?
 - c. What you just found was the ratio of the change to the original amount and then converted it to a percent. This is called _____.
7. What does 200% represent?

LESSON 10: Percent of Change

Directions: Complete the following SOLVE problem with your teacher.

A local neighborhood watch program reported that since they began the program, car break-ins have gone from 5 per month to 1 per month in their neighborhood. What is the percent of change in the number of break-ins per month?

S Underline the question.

The problem is asking me to find _____

_____.

O Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

Is your answer reasonable? (Compare your answer to the estimate.)

Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

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Directions: Complete the following SOLVE problem with your teacher.

The population of Mt. Holly, North Carolina in 2000, was about 9,600 residents. In 2008, the population was about 10,100. What was the percent of increase in the population from 2000 to 2008?

S Underline the question.

The problem is asking me to find _____
_____.

O Identify the facts.

Eliminate the unnecessary facts.
List the necessary facts.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

Is your answer reasonable? (Compare your answer to the estimate.)

Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

LESSON 10: Percent of Change

Directions: Complete this page with your partner. Determine what the percent of change is for each question.

Problem	Ratio	Solve
1. A pair of boots normally sells for \$89.00. They are on sale for \$50.		
2. In 1996, the minimum wage was \$4.75. In 2009, the minimum wage is \$7.25.		
3. Tameka was getting \$6 a week for her allowance. Her parents decided to raise her allowance to \$9 a week.		
4. Amber's math score was a 94% at the end of Quarter 1. At the end of Quarter 2, her score had fallen by 4 points to a 90%.		

LESSON 10: Percent of Change

Directions: Complete this page with your teacher and partner.

1. Read the examples below and determine if there is a decrease or increase in the percent of change and what that percent is.
 - a. A video game system usually costs \$200. It is on sale for 30% off. What is the sale price of the system?
 - b. The toy store buys a robot action figure for \$55 from the toy company and marks the price up by 70% to sell to the public.
 - c. In 1985 the average person watched 10 hours of television per week. In 1990, another study indicated that amount had increased by 45%.
 - d. Over a ten-year period, the number of students enrolled at Martin Middle School decreased by 15% from its opening enrollment of 800.
2. Determine what the observation is for each question given below.

Question	Observation
What is different about these questions compared to the ones you previously have done?	
Use the ratio we have been using for Percent of Change $(P) = \frac{\text{difference}}{\text{original}}$ and determine what we will put in the place of what is missing.	
What will need to be done when we determine what our variable equals?	

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The problem is asking me to find _____

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L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

Is your answer reasonable? (Compare your answer to the estimate.)

Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

LESSON 10: Percent of Change

Directions: Complete the following SOLVE problem with your teacher.

The toy store buys a robot action figure for \$55 each from the toy company and marks the price up by 70% to sell to the public. What is the price of the robot action figure after the mark-up?

S Underline the question.

The problem is asking me to find _____
_____.

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Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

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Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

LESSON 10: Percent of Change

Directions: Use the percent of change formula for the problems in the chart.

Problem	Ratio	Solve
<p>1. A grocery store manager stated that their profits went up 10% this quarter. If the previous quarter had profits of \$2,000, what are the new quarter's profits?</p>		
<p>2. Last month, East Middle School had 12 students absent, on average, each day. The principal stated that this month the absentee rate decreased by 25%. How many students on average are absent each day?</p>		
<p>3. In 1985, the average person watched 10 hours of television per week. In 1990, another study indicated that amount had increased by 45%. How many hours do people watch per week?</p>		
<p>4. Over a ten-year period, the number of students enrolled at Martin Middle School decreased by 15% from its opening enrollment of 800. How many students are now enrolled?</p>		

LESSON 10: Percent of Change

Directions: Complete the following SOLVE problem with your teacher.

Casey is shopping for a snowboard. Last week, the one he wanted had a price of \$130. He thought this was too much, so he decided not to buy it. This week, the store is having a sale, and the snowboard has a price of \$100. What is the percent of change?

S Underline the question.

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_____.

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List the necessary facts.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

Is your answer reasonable? (Compare your answer to the estimate.)

Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

LESSON 10: Percent of Change

Directions: Complete this page with your teacher and partner.

1. What is the percent of change if a number goes from 90 to 81? Is it a percent decrease or a percent increase?

2. What is the percent of change if a number goes from 18 to 45? Is it a percent decrease or a percent increase?

3. Last year, the chess club had 19 members. This year, the chess club has a total of 27 members. What is the percent increase in members?

4. The local police chief said that this week the revenue from parking tickets increased 18% from \$800 last week. How much did the revenue increase? How much money was collected from parking tickets this week?

LESSON 10: Percent of Change

Homework

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Name _____ Date _____

Directions: Use the percent of change formula to solve the following problems. Round to the nearest hundredth if necessary.

1. What is the percent of change if 64 is decreased to 48?
2. What is the percent of change if 15 is increased to 21?
3. What is the percent of change if 258 is decreased to 200?
4. What is the percent of change if 45 is increased to 66?
5. The Tonkin family recently upgraded their cable tv service and added more channels. Their monthly bill has increased from \$42 to \$63. What is the percent change in their bill?
6. Beth received a 90 on her first science test. On the second science test, she received an 82. What was the percent of change in her test scores?

LESSON 10: Percent of Change

Homework
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- 7.** The number of volunteers to walk dogs at the local animal shelter last year was 20. This year, the number of volunteers has risen to 50. What is the percent increase in the number of volunteers?

- 8.** Noah the cat went to the veterinarian, who said that at 22 pounds, the cat was overweight. She put the cat on a diet, and two months later, the cat weighed 19 pounds. What was the percent of decrease in Noah's body weight?

- 9.** Ms. Barber is excited because she found out at work today that she will be getting a pay increase of 5%. Her weekly salary is currently \$800. How much will her weekly pay be going up?

- 10.** Janeka is buying a sweater. The tag on the sweater has a price of \$28. However, the sale sign says that all sweaters are on sale for 20% off. How much will she be able to take off the price of the sweater? How much will she pay for the sweater?