

Lesson Summary

- Within each problem, there are keywords that determine if the problem represents a percent increase or a percent decrease.
- Equations can be used to solve percent problems using the basic equation
$$\text{Quantity} = \text{Percent} \times \text{Whole}.$$
- *Quantity* in the percent formula is the amount of change (increase or decrease) or the amount after the change.
- *Whole* in the percent formula represents the original amount.

Problem Set

1. A store advertises 15% off an item that regularly sells for \$300.
 - a. What is the sale price of the item?
 - b. How is a 15% discount similar to a 15% decrease? Explain.
 - c. If 8% sales tax is charged on the sale price, what is the total with tax?
 - d. How is 8% sales tax like an 8% increase? Explain.
2. An item that was selling for \$72.00 is reduced to \$60.00. Find the percent decrease in price. Round your answer to the nearest tenth.
3. A baseball team had 80 players show up for tryouts last year and this year had 96 players show up for tryouts. Find the percent increase in players from last year to this year.
4. At a student council meeting, there was a total of 60 students present. Of those students, 35 were female.
 - a. By what percent is the number of females greater than the number of males?
 - b. By what percent is the number of males less than the number of females?
 - c. Why is the percent increase and percent decrease in parts (a) and (b) different?
5. Once each day, Darlene writes in her personal diary and records whether the sun is shining or not. When she looked back through her diary, she found that over a period of 600 days, the sun was shining 60% of the time. She kept recording for another 200 days and then found that the total number of sunny days dropped to 50%. How many of the final 200 days were sunny days?
6. Henry is considering purchasing a mountain bike. He likes two bikes: One costs \$500, and the other costs \$600. He tells his dad that the bike that is more expensive is 20% more than the cost of the other bike. Is he correct? Justify your answer.

7. State two numbers such that the lesser number is 25% less than the greater number.
8. State two numbers such that the greater number is 75% more than the lesser number.
9. Explain the difference in your thought process for Problems 7 and 8. Can you use the same numbers for each problem? Why or why not?
10. In each of the following expressions, c represents the original cost of an item.
- i. $0.90c$
 - ii. $0.10c$
 - iii. $c - 0.10c$
- a. Circle the expression(s) that represents 10% of the original cost. If more than one answer is correct, explain why the expressions you chose are equivalent.
 - b. Put a box around the expression(s) that represents the final cost of the item after a 10% decrease. If more than one is correct, explain why the expressions you chose are equivalent.
 - c. Create a word problem involving a percent decrease so that the answer can be represented by expression (ii).
 - d. Create a word problem involving a percent decrease so that the answer can be represented by expression (i).
 - e. Tyler wants to know if it matters if he represents a situation involving a 25% decrease as $0.25x$ or $(1 - 0.25)x$. In the space below, write an explanation that would help Tyler understand how the context of a word problem often determines how to represent the situation.