2-10 Change Expressed as a Percent

🔊 Vocabulary

● Review

1. What is a *percent*? Use the term *ratio* in your definition.

2. Write the *percent* of a dollar each coin represents.

penny	nickel	dime	quarter
____ %	____ %	____ %	____ %

● Vocabulary Builder

change (noun) **chaynj**

Main Idea: When a quantity increases or decreases, it undergoes a **change**.

Examples: If the temperature of a room **changes** from 78°F to 75°F, the **change** is a *decrease* of 3°F. If the temperature of the room **changes** from 65°F to 69°F, the **change** is an *increase* of 4°F.

● Use Your Vocabulary

Describe each *change* as an *increase* or a *decrease*.

3. 72 to 84

4. 25 to 16

5. $.99 to $1.02

You can find the percent change when you know the original amount and how much it has changed.

If the new amount is greater than the original amount, the percent change is a *percent increase*. If the new amount is less than the original amount, the percent change is a *percent decrease*.

Key Concept   Percent Change

Percent change is the ratio of the **amount of change** to the original amount. The **amount of change** is the amount of increase or decrease.

> **Percent Change**
>
> $p\% = \dfrac{\text{amount of increase or decrease}}{\text{original amount}}$

6. Draw a line from each phrase in Column A to the correct subtraction expression in Column B.

Column A	Column B
amount of increase	original amount − new amount
amount of decrease	new amount − original amount

✓ Problem 1   Finding a Percent Decrease

Got It? The average monthly precipitation for Chicago, Illinois, peaks in June at 4.1 in. The average precipitation in December is 2.8 in. What is the percent decrease from June to December?

7. Write an expression to show the change in temperature from June to December.

[ ] − [ ]

8. Complete the equation.

$$\text{Percent change} = \frac{\boxed{} - \boxed{}}{4.1} \qquad \text{Substitute.}$$

$$= \frac{\boxed{}}{4.1} \qquad \text{Simplify.}$$

$$\approx \boxed{} \% \qquad \text{Write as a percent.}$$

9. The percent decrease in precipitation is about [ ] %.

✓ Problem 2   Finding a Percent Increase

Got It? In one year, the toll for passenger cars to use a tunnel rose from $3 to $3.50. What was the percent increase?

10. The new amount of the toll is $ [ ] .

The original amount of the toll is $ [ ] .

11. Explain how you know you are finding a percent increase.

_____

_____

Lesson 2-10

12. Substitute the values you know into the Percent Change formula.

$$\text{Percent change} = \frac{\boxed{} - \boxed{}}{\boxed{}}$$

13. Now solve the equation. Write the result as a percent.

14. The price of the toll increased by about $\boxed{}$ %.

✅ **Problem 3** **Finding Percent Error**

Got It? You think that the distance between your house and a friend's house is 5.5 mi. The actual distance is 4.75 mi. What is the percent error in your estimation?

15. In the percent error ratio, you find an absolute value in the numerator. The absolute value of a number is always negative / nonnegative .

16. Complete the steps to solve the problem.

$$\text{percent error} = \frac{|\,\text{estimated value} - \text{actual value}\,|}{\text{actual value}} \qquad \text{Write the ratio.}$$

$$= \frac{|\,5.5 - \boxed{}\,|}{\boxed{}} \qquad \text{Substitute.}$$

$$= \frac{\boxed{}}{\boxed{}} \qquad \text{Simplify.}$$

$$\approx \boxed{} \text{, or about } \boxed{} \% \qquad \text{Write the result as a percent.}$$

✅ **Problem 5** **Finding the Greatest Possible Percent Error**

Got It? The diagram at the right shows the dimensions of a gift box to the nearest inch. Its measured volume is 360 in.^{3}, and the greatest possible error in volume is about 24%. If the gift box's dimensions were taken to the nearest half inch, how would the greatest possible error be affected?

5 in.

12 in.

6 in.

17. The greatest possible error in each measurement is half the unit of measure. Find the least and greatest possible measurements for each dimension.

$5 - 0.25 = \boxed{}$ $\qquad$ $6 - 0.25 = \boxed{}$ $\qquad$ $12 - \boxed{} = \boxed{}$

$5 + 0.25 = \boxed{}$ $\qquad$ $6 + \boxed{} = \boxed{}$ $\qquad$ $\boxed{} + \boxed{} = \boxed{}$

18. Find the minimum and maximum possible volumes. Use $V = \ell wh$.

$V = (11.75) \cdot (5.75) \cdot \boxed{}$ $\qquad$ $V = (12.25) \cdot (6.25) \cdot \boxed{}$

$\approx \boxed{}$ in.^{3} $\qquad\qquad$ $\approx \boxed{}$ in.^{3}

19. Now find the differences and circle the greater difference.

minimum volume difference $\qquad\qquad$ maximum volume difference

$360 - \boxed{} = \boxed{}$ $\qquad\qquad$ $\boxed{} - 360 = \boxed{}$

20. Complete the equation to determine the greatest possible percent error.

$$\frac{\text{greater difference in volume}}{\text{measured volume}} = \frac{\boxed{}}{360} \approx \boxed{} \text{, or about } \boxed{} \%$$

21. Compare your answer from Exercise 20 to the original greatest possible error of about 24%. How is greatest possible error affected if you measure to the nearest half inch rather than to the nearest inch?

_____

✔ Lesson Check • Do you UNDERSTAND?

Vocabulary Determine whether each situation involves a *percent increase* or a *percent decrease*.

A hat that originally cost $12 sold for $9.50.

You buy a CD for $10 and sell it for $8.

A store buys glasses wholesale for $2 per glass. The store sells them for $4.50.

Underline the correct word to complete each sentence.

22. When the new amount is greater than the original amount, the percent change is a

percent increase / decrease .

23. When the new amount is less than the original amount, the percent change is a

percent increase / decrease .

24. The price of the hat went down, so it is a percent increase / decrease .

25. The price of the CD went down, so it is a percent increase / decrease .

26. The price of the glasses went up / down , so it is a percent increase / decrease .

✔ Math Success

Check off the vocabulary words that you understand.

☐ percent change ☐ percent increase ☐ percent decrease ☐ percent error

Rate how well you can *solve percent increase and decrease problems*.

Need to review $\quad$ 0 $\quad$ 2 $\quad$ 4 $\quad$ 6 $\quad$ 8 $\quad$ 10 $\quad$ Now I get it!