Lesson 6.1 Reteach *Using the Percent Proportion*

In a **percent proportion**, one ratio compares *part* of a quantity to the *whole* quantity. The other ration is the equivalent percent, written as a fraction, with a denominator of 100.

$$\frac{\text{part}}{\text{whole}} = \frac{\text{percent}}{100}$$

Example 1: Find each percent.

a. Twelve is what percent of 16?

$\frac{a}{b} = \frac{p}{100} \longrightarrow \frac{12}{16} = \frac{p}{100}$ Replace the variables.

$12 \cdot 100 = p \cdot 16$ Find the cross products.

$1200 = 16p$ Multiply.

$75 = p$ Divide.

So, twelve is 75% of 16.

b. What percent of 8 is 7?

$\frac{a}{b} = \frac{p}{100} \longrightarrow \frac{7}{8} = \frac{p}{100}$

$p \cdot 8 = 100 \cdot 7$

$700 = 8p$

$87.5 = p$

So, 87.5% of 8 is 7.

Example 2: Find the part or the whole.

a. What number is 1.4% of 15?

$\frac{a}{b} = \frac{p}{100} \longrightarrow \frac{a}{15} = \frac{1.4}{100}$ Replace the variables.

$a \cdot 100 = 15 \cdot 1.4$ Find the cross products.

$100a = 21$ Multiply.

$a = 0.21$ Divide.

So, 0.21 is 1.4% of 15.

b. 225 is 36% of what number?

$\frac{a}{b} = \frac{p}{100} \longrightarrow \frac{225}{b} = \frac{36}{100}$

$225 \cdot 100 = 36 \cdot b$

$22{,}500 = 36b$

$625 = b$

So, 225 is 36% of 625.

Lesson 6.3 Reteach *Using the Percent Equation*

A **percent equation** is an equivalent form of the percent proportion. In a percent equation, the percent is written as a decimal.

$$\text{part} = \text{whole} \bullet \text{percent}$$

Example: Solve each problem using a percent equation.

a. Find 22% of 95.

$p = 0.22(95)$

$p = 20.9$

So, 22% of 95 is 20.9.

b. 15 is what percent of 75?

$15 = n(75)$

$0.2 = n$

So, 15 is 20% of 75.

c. 90 is 20% of what number?

$90 = 0.2w$

$450 = w$

So, 90 is 20% of 450.

Lesson 6.4 Reteach *Percent of Change*

A **percent of change** is a ratio of the amount of change to the original amount.

$$\text{percent of change} = \frac{\text{big} - \text{small}}{\text{original}}$$

Example 1: Find the percent of change from 75 yards to 54 yards.

Step 1 Subtract to find the amount of change.

$54 - 75 = -21$ final amount-original amount

Step 2 Write a ratio that compares the amount of change to the original amount. Express the ratio as a percent.

$$\text{percent of change} = \frac{\text{amount of change}}{\text{original amount}}$$

$$= \frac{-21}{75} = -0.28 \text{ or } -28\%$$

A **percent of error** is a ratio of the amount of error to the actual value of a measurement.

$$\text{percent of error} = \frac{\text{big} - \text{small}}{\text{actual}}$$

Example 2: Dominic estimates that the length of a ribbon is 75 centimeters. It is actually 66 centimeters long. What is the percent of error of his estimate?

Step 1 Subtract to find the amount of error.

$75 - 66 = 9$ Subtract the actual value from the estimate.

Step 2 Write a ratio that compares the amount of change to the original measurement. Express the ratio as a percent.

$$\text{percent of error} = \frac{\text{amount of error}}{\text{actual value}} \times 100 = \frac{9}{66} \times 100 \approx 0.13$$

So, the percent error is 13.6%

Lesson 6.5 Reteach *Discount and Markup*

A store sells items for more than it pays for those items so it can make a profit. The amount of increase is the **markup.** The percent of markup is a percent of increase. The amount the customer actually pays for an item is the **selling price.**

Example 1: Find the selling price if a store pays $167 for a set of luggage and the markup is 38%.

Method 1: Find the amount of the markup first.

The whole is $167. The percent is 38. You need to find the amount of the markup, or the part.

Let m represent the amount of the markup.

$m = 0.38 \cdot 167$ part = percent · whole

$m = 63.46$ Multiply.

Add the markup to the cost. So, $167 + $63.46 = $230.46.

Method 2: Find the total percent first.

The customer will pay 100% of the store's price plus an extra 38%, or 138% of the store's price.

Let p represent the price.

$p = 1.38(167)$ part = percent · whole

$p = 230.46$ Multiply.

The selling price is $230.46.

When a store has a sale, the **discount** is the amount by which the regular price is reduced. The percent discount is a percent of decrease.

Example 2: Find the sale price of a purebred German Shepherd puppy that is regularly $450 and is on sale for 35% off.

Method 1: Find the amount of discount first. Let d represent the amount of the discount.

$d = 0.35 \cdot 450$ part = percent · whole

$d = 157.50$ Multiply.

Subtract the discount from the original cost. So, $450 – 157.50 = $292.50

Method 2: Find the total percent first. Let p represent the sale price.

The amount of the discount is 35%, so the customer will pay 100% - 35% or 65% of the original cost.

$p = 0.65(450)$ part = percent · whole

$p = 292.50$ Multiply.

The sale price is $292.50.

Lesson 6.6 Reteach *Simple and Compound Interest*

Interest is the amount of money paid or earned for the use of money by a financial institution. To find, use the formula:

$$I = prt$$

where I is the interest earned, p is the principal (the amount of money invested or borrowed), r is the interest rate (written as a decimal), and t is the time in years. **Simple interest** is paid only on the initial principal.

Example 1: Find the simple interest for $500 invested at 3.2% for 5 years.

$I = prt$ Write the simple interest formula.

$I = 500 \cdot 0.032 \cdot 5$ Replace p with 500, r with 0.032, and t with 5.

$I = 80$ Simplify.

The simple interest is $80.

Compound interest is paid on the initial principal and on interest earned in the past. To find, use the formula:

$$A = p(1 + r)^t$$

where A is the total amount, p is the principal (the amount of money invested or borrowed), r is the interest rate (written as a decimal), and t is the time in years.

Example 2: What is the total amount of money in an account where $350 is invested at an interest rate of 7.25% compounded annually for 2 years?

Find the amount of money in the account at the end of the first year.

$A = p(1 + r)^t$ Write the compound interest formula.

$A = 350(1 + 0.0725)^2$ Replace p with 350, r with 0.0725, and t with 2.

$A = 402.5896 \approx 402.59$ Simplify.

At the end of the two years, there is $402.59 in the account.