NAME_____

Module 7 **Ratio, Proportion, and Percent**
Lesson 7 **Problem Solving with Percents**

Lesson Notes 7.7

Lesson Objectives

- Solve real-world percent problems including percent of increase and decrease with or without technology.
- Solve real-world percent problems involving simple and compound interest with or without technology.

Subtopic 1 Percent of Increase and Percent of Decrease

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

1 Kathy used 240 cell phone minutes last month. This month, she used 600 minutes. What was the percent of change from last month to this month?

$$600 - 240 = 360$$

$$\text{percent of increase} = \frac{360}{240} = \frac{3}{2} = 1\frac{1}{2} = 150\%$$

2 The original price of a camera is $300. The price decreased 20%. What is the new price of the camera?

$$20\% \text{ of } 300$$
$$0.2 \times 300 = 60$$

Amount of decrease: $60
New price = original price – amount of decrease
New price: $300 – $60 = $240

Subtopic 2 Simple Interest

Interest is the **amount paid** for the use of money.

- When you **save** money, the bank pays you interest.
- If you **borrow** money, you have to pay the bank interest.

Simple Interest
$I = Prt$

I: Interest
P: **Principal**
r: rate
t: **time in years**

3 Lori saved $400 for three years at a rate of 4%. Find the amount of simple interest and the total amount in the account.

$$I = Prt$$
$$I = 400(0.04)(3)$$
$$I = 48$$
Total amount = $400 + $48 = $448

Subtopic 3 Compound Interest

Compound interest is interest calculated on both the principal and any **interest** already added on.

Annually: **Once** a year
Semiannually: **Twice** a year
Quarterly: Four times a year
Monthly: Twelve times a year

4 Five-thousand dollars was deposited at a rate of 6%, compounded annually. Find the amount of money after two years.

Interest after one year:
$$I = Prt$$
$$I = (\$5{,}000)(0.06)(1) = \$300$$
Amount in account after one year:
$$A = P + I$$
$$A = \$5{,}000 + \$300 = \$5{,}300$$
Interest for year two:
$$I = Prt$$
$$I = (\$5{,}300)(0.06)(1) = \$318$$
Amount in account after two years:
$$A = P + I$$
$$A = \$5{,}300 + \$318 = \$5{,}618$$