

# ALGEBRA 1

## Chapter 1, Section 1

### Variables in Algebra

#### VOCABULARY:

• Variable –
• Variable Expression –
• Substitute –
• Simplify –
• Unit Analysis –
• Verbal Model –

#### GOALS:

- Evaluate a variable expression.
- Write a variable expression that models a real-life situation.

1. Evaluating a Variable Expression – this involves substituting a numerical value for a variable in a mathematical expression.

Examples: Evaluate the expressions below when  $x = 3$ .

<b>a.</b> $8x$	<b>b.</b> $\frac{9}{x}$	<b>c.</b> $x + 5$	<b>d.</b> $11 - x$
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2. Evaluating a Real Life Expression: (Speed) – this models a real life situation to solve problems which have a finite answer. One example is that of average speed and the formula is:

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{d}{t} \quad \text{or you can use Distance} = (\text{speed}) \bullet (\text{time})$$

You also need to take into account the measure of time being used, whether minutes, hours, etc.

Examples:

<b>a.</b> If a car traveled 240 miles in 4 hours what was its average speed?
<b>b.</b> If a car traveled at 55 miles per hour for 6 hours how far did it travel?
<b>c.</b> How long will it take a car traveling at 50 miles per hour to travel 275 miles?
<b>d.</b> What is the speed of a car traveling 3 miles in 2 minutes?

3. Evaluating a Real Life Expression: (Simple Interest) – this also models a real life situation which involves money and how much interest you might gain. In this formula, simple interest is calculated by your original money  $P$  (principal) at an annual interest rate ( $r$ ) for ( $t$ ) years. The formula is shown below.

Simple Interest =  $P \bullet r \bullet t$  where  $P$  is in dollars,  $r$  is a percentage but converted to a decimal and  $t$  is the time in years.

Examples:

<b>a.</b> Deposit of \$200; Interest rate of 5%; for 3 years $S = P \bullet r \bullet t \longrightarrow S = (200)(0.05)(3) = \boxed{\$30.00}$
<b>b.</b> Deposit of \$500; Interest rate of 4%; for 2 years
<b>c.</b> Deposit of \$250; Interest rate of 5.5%; for 0.5 years
<b>d.</b> Deposit of \$2000; Interest rate of 6.25%; for 18 months