Name _____ Date _____ Class _____

**Math Skills** **LESSON 3**

# *Solve for Acceleration*

Acceleration is a measure of how much the velocity of an object changes in a unit of time. Acceleration is measured in units such as $m/s^2$.

Acceleration is the change in velocity during a time interval divided by the time interval during which the velocity changes. This can be shown by the equation below, where $a$ = acceleration, $v_f$ = final speed, $v_i$ = initial speed, and $t$ = total time.

$$a = \frac{(v_f - v_i)}{t}$$

Pablo is running sprints. At **10** seconds, his speed is **2** m/s. At **20** seconds, his speed is **4** m/s. What was his acceleration during this time? To solve this problem, follow the steps below.

Step 1 Identify the variables given in the problem.
Subtract to find the time interval.
$v_f = \mathbf{4}$ m/s
$v_i = \mathbf{2}$ m/s
$t = \mathbf{20}$ s $- \mathbf{10}$ s $= \mathbf{10}$ s

Step 2 Substitute the known values to solve the equation.
You are solving for $a$, the acceleration.

$$a = \frac{(v_f - v_i)}{t}$$

$$a = \frac{(\mathbf{4}\text{ m/s} - \mathbf{2}\text{ m/s})}{\mathbf{10}\text{ s}}$$

$$a = \mathbf{0.2}\text{ m/s}^2$$

## Practice

**1.** After 30 s, a runner is sprinting at 3 m/s. But, 10 s later, the runner is sprinting at 3.8 m/s. What is the runner's acceleration during this time?

**2.** A car was moving at 14 m/s. After 30 s, its speed increased to 20 m/s. What was the acceleration during this time?

**3.** Kiko is coasting on her bicycle down a hill. After 3 s, her speed is 10 m/s. After 8 s, her speed is 25 m/s. What is her acceleration during this time?

**4.** Han's younger sister is riding her tricycle in a straight line. After 3 s, her speed is 0.5 m/s. After 5 s, her speed is 1.5 m/s. What is her acceleration during this time?