

# 1.5

## Use a Problem Solving Plan

**Goal** • Use a problem solving plan to solve problems.

*Your Notes*

### VOCABULARY

**Formula** An equation that relates two or more quantities

### A PROBLEM SOLVING PLAN

Use the following four-step plan to solve a problem.

**Step 1** Read and Understand Read the problem carefully. Identify what you want to know and what you want to find out.

**Step 2** Make a Plan Decide on an approach to solving the problem.

**Step 3** Solve the Problem Carry out your plan. Try a new approach if the first one isn't successful.

**Step 4** Look Back Check that your answer is reasonable.

### Example 1 *Read a problem and make a plan*

You have \$7 to buy orange juice and bagels at the store. A container of juice costs \$1.25 and a bagel costs \$.75. If you buy two containers of juice, how many bagels can you buy?

#### Solution

**Step 1** Read and Understand What do you know? You know how much money you have and the price of a bagel and a container of juice.

What do you want to find out? You want to find out the number of bagels you can buy.

**Step 2** Make a Plan Use what you know to write a verbal model that represents what you want to find out. Then write an equation and solve it.

**Example 2** Solve a problem and look back

Solve the problem in Example 1 by carrying out the plan. Then check your answer.

**Solution**

**Step 3** Solve the Problem Write a verbal model. Then write an equation. Let  $b$  be the number of bagels you buy.

Price of juice (in dollars)		Number of containers		Price of bagel (in dollars)		Number of bagels		Cost (in dollars)
↓		↓		↓		↓		↓
<u>1.25</u>	•	<u>2</u>	+	<u>0.75</u>	•	$b$	=	<u>7</u>

The equation is  $\underline{2.5} + \underline{0.75} b = \underline{7}$ . One way to solve the equation is to use the strategy *guess, check, and revise*.

**Guess** an even number that is easily multiplied by 0.75. Try 4.

$\underline{2.5} + \underline{0.75} b = \underline{7}$	<b>Write equation.</b>
$\underline{2.5} + \underline{0.75} (4) \stackrel{?}{=} \underline{7}$	<b>Substitute 4 for <math>b</math>.</b>
$\underline{5.5} \neq \underline{7}$	<b>Simplify; 4 <u>does not</u> check.</b>

Because  $\underline{5.5} < \underline{7}$ , try an even number greater than 4. Try 6.

$\underline{2.5} + \underline{0.75} b = \underline{7}$	<b>Write equation.</b>
$\underline{2.5} + \underline{0.75} (6) \stackrel{?}{=} \underline{7}$	<b>Substitute 6 for <math>b</math>.</b>
$\underline{7} = \underline{7}$	<b>Simplify.</b>

For \$7 you can buy 6 bagels and 2 containers of juice.

**Step 4** Look Back Each additional bagel you buy adds \$0.75 to the \$2.50 you pay for the juice. Make a table.

<b>Bagels</b>	0	1	2	3	4	5	6
<b>Total Cost</b>	<u>2.50</u>	<u>3.25</u>	<u>4</u>	<u>4.75</u>	<u>5.5</u>	<u>6.25</u>	<u>7</u>

The total cost is \$7 when you buy 6 bagels and 2 containers of juice. The answer in step 3 is correct.

## Your Notes

✔ **Checkpoint** Complete the following exercise.

1. Suppose in Example 1 that you have \$12 and you decide to buy three containers of juice. How many bagels can you buy?

11 bagels

### FORMULA REVIEW

#### Temperature

$C = \frac{5}{9}(F - 32)$ , where  $F =$  degrees Fahrenheit  
and  $C =$  degrees Celsius

#### Simple interest

$I = Prt$ , where  $I =$  interest,  $P =$  principal,  
 $r =$  interest rate (as a decimal), and  $t =$  time

#### Distance traveled

$d = rt$ , where  $d =$  distance traveled,  $r =$  rate,  
and  $t =$  time

#### Profit

$P = I - E$ , where  $P =$  profit,  $I =$  income, and  
 $E =$  expenses

✔ **Checkpoint** Complete the following exercise.

2. In Example 1, the store where you bought the juice and bagels had an income of \$7 from your purchase. The profit the store made from your purchase is \$2.50. Find the store's expense for the juice and bagels.

\$4.50

## Homework