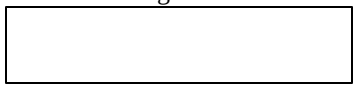
Story Problems

Strategy	**Example 1**
1. Read the problem carefully, as many times as necessary to understand what the problem is saying and what it is asking (what things are given, what things do you need to find out?).	The length of a rectangle is 7 more than 3 times the width. If the perimeter is 54 cm., find the dimensions of the rectangle.
2. Use pictures, tables, or diagrams whenever you think it will make the information clearer.	length width 
3. Ask whether there is some underlying relationship or formula that you need to know. If not, then the words of the problem itself should give you the relationship. Write out the relationship using words (not numbers or variables).	For this problem, we need to know that: **perimeter = 2(length) + 2(width)**
4. Clearly identify the unknown quantity (or quantities). Assign a variable and write down what the variable stands for.	The unknown quantities are length and width. **Let w = width of the rectangle.** **Then length = 3w + 7.**
5. Using the information from steps 3 and 4, write a mathematical equation.	perimeter = 2(length) + 2(width) **54 = 2(3w+7) + 2w**
6. Solve the equation.	**54 = 6w + 14 + 2w** **54 = 8w + 14** **40 = 8w** **5 = w**
7. Make sure you answer what is asked in the problem.	The problem asks for the dimensions. We found that the width is 5 cm. To find the length, we need to use length = 3w + 7, so length = 3(5) + 7 = 22.
8. Check your answer to make sure it makes sense.	Check: perimeter = 2(length) + 2(width) 54 = 2(22) + 2(5) Yes!

Example 2 (two variables)

Last year, Troy invested $14,000. He invested part of the money into a certificate paying 9% interest and the rest into a bond paying 11% interest. At the end of the year, Troy had earned $1,350. How much did he deposit into each account?

Steps 2, 3, and 4 from strategy on other side:
Here we can combine steps 2, 3 and 4 into a table that organizes the information. The unknown quantities are the amounts invested into each account and the underlying relationship is that interest = principle * rate * time (I = prt).

Account	Amount invested	Interest earned (I = prt)
Certificate paying 9% interest	x	x(0.09)(1)
Bond paying 11% interest	y	y(.11)(1)

Write a mathematical equation (step 5):
Here, we have information to write two equations.
Amount invested = x + y = 14000
Interest earned = 0.09x + 0.11y = 1350

Solve the equation (I will use the substitution method) (step 6):

First, solve one equation for y.
x + y = 14000
y = 14000 - x

Next, substitute the above expression into the other equation.
0.09x + 0.11(14000 – x) = 1350
0.09x + 1540 – 0.11x = 1350
-0.02x + 1540 = 1350
-0.02x = -190
x = 9500

Finally, plug the value for x into either equation to get y.
y = 14000 – 9500
y = 4500

Answer the question (step 7):
Troy invested $9,500 into the certificate paying 9% interest and $4,500 into the bond paying 11% interest.

Check the answers (step 8):
9500 + 4500 = 14000 (YES!)

0.09(9500) + 0.11(4500) = 1350
855 + 495 = 1350 (YES!)