Working With "Interest" Word Problems

When working with Interest word problems, we need to use the formula for finding interest to make the work easier to set up and solve. The Interest formula is:

$$I = Prt$$

"Interest" is equal to the "principal" multiplied by the "rate" multiplied by the "time."

We want to set up a chart that can organize the information given in the word problem.

Principal	Rate	Time	=	Interest

Based on the information given in the word problem, we can complete the chart. Here is the word problem:

A woman invests a sum of money at 6% and $3,000 more than this at 9%. If the total interest earned in one year is $4,170, how much was invested at each rate?

We have two rates given as 6% and 9%. Before entering them into the chart, we must first change them from percent to decimal form. So we have 0.06 and 0.09 to put into the chart as the rates. We were also given the total amount of interest earned on the two accounts so we can fill that in also. The time period that the interest was earned in is also given as one year. We can fill that in too. So far we have:

Principal	Rate	Time	=	Interest
	0.06	1		
	0.09	1		
Total				$4,170

The information that we do not know is the principal that was invested. That is the information we must find. We do know that $3,000 more was invested at the 9% rate. We do not know anything about the amount invested at 6%, so we are going to let that be our unknown, or *x*. That means that "x + $3,000" was invested at 9%. That is more information to put into our chart.

Principal	Rate	Time	=	Interest
x	0.06	1		
x + 3000	0.09	1		
Total				$4,170

Now we will multiply across the first two rows to give us the "Interest" information to solve the problem.

Principal	Rate	Time	=	Interest
x	0.06	1		0.06x
x + 3000	0.09	1		0.09(x + 3000)
Total				$4,170

Our equation to solve comes from the last column. We will add the first two rows together and set them equal to the total amount of interest earned.

$$0.06x + 0.09(x + 3000) = 4170$$

Now we can solve the problem!

$$0.06x + 0.09(x + 3000) = 4170$$

$$0.06x + 0.09x + 270 = 4170$$

$$0.15x + 270 = 4170$$

$$0.15x = 3900$$

$$x = 26000$$

What we found was the principal amount that was invested at 6%. To find the principal invested at 9%, we must add 26000 + 3000 (comes from the Principal column on the chart) and we get 29,000. So the answer to how much was invested at each rate is $26,000 at 6% and $29,000 at 9%.

You can and <u>should</u> verify your answer.

$$26,000(0.06) + 29,000(0.09) = 4170$$

$$1560 + 2610 = 4170$$

$$4170 = 4170$$

Since both sides are equivalent, you can be sure that your work is correct.

NOTE: If a problem does not state the time period that the investment was for, assume it to be one year.