SOLVING READING PROBLEMS USING TABLES

Reading problems terrorize students. Reading problems with two or more parts seem to be especially confusing. This study guide attempts to help students make sense of these problems.

When a problem compares two or more items, one of them will be used for the base of comparison. Ask yourself, "Which term do I know nothing about?" That one becomes your variable (x). Then the other term is expressed in terms of this variable.

> Example: One number is 6 more than twice another. The sum of these numbers is 21. Set up a table using the terms "one number" and "another." The problem describes "one number" but tells very little about "another." So "another" becomes our "x" term and "one number" becomes $2x + 6$. Our equation, in English, is "one number" plus "another" is 21. We translate this into algebra, then solve it. See table 1.

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Item	How many?	Solution (added when done)
One number	$2x + 6$	16
Another	x	5
Result	21	

Equation

$2x + 6 + x = 21$

$3x + 6 = 21$

$-6 \quad -6$

$\frac{3x}{3} = \frac{15}{3}$

so… $x = 5$

and $2x + 6 = 16$

Other problems that need a table are age, coin, mixture and investment problems. The basic format of the table remains the same, but students are encouraged to arrange the columns in an order that makes sense to them.

Age problems usually use two time periods ("now" and "then"). The equation is created from the relationship between the ages of two (or more) people.

> Example: Bill is 12 years older than Sally. In five years the sum of their ages will be 40. How old are they now? Look at these three sentences. The first sentence tells you the relationship <u>now</u> (notice that we know nothing about Sally, she becomes the "*x*"). The second tells you to add five years to their current ages and also sets up your equation (Bill + 5 plus Sally + 5 = 40.) The third sentence tells you what you are required to answer (<u>Both</u> ages, <u>now</u>.)

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Item	Age Now	Age in 5 yrs	Solution (added when done)
Bill	$x + 12$	$(x + 12) + 5$	21
Sally	x	$x + 5$	9
		40	

Equation

$(x + 12) + 5 + x + 5 = 40$

$2x + 22 = 40$

$-22 \quad -22$

$\frac{2x}{2} = \frac{18}{2}$

so… $x = 9$

and $x + 12 = 21$

Coin, investment, and mixture problems require a "value" column or sometimes two.

Example (Coin): I have $2.30 in nickels, dimes and quarters. I have three times as many dimes as nickels. I have two more quarters than nickels. How many of each coin do I have? Sentence one tells you the total and which "items" you have. Number two tells you the relationship between the dimes and nickels (What do you know about my nickels? Nothing!) Sentence three gives you the relationship of quarters to nickels (still no facts about nickels, so it is our "*x*"). The last sentence gives you your task: find three answers – Nickels, dimes, and quarters!

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Item	How Many	Value of one	Total Value	Solution
Nickel	x	.05	.05x	3
Dime	3x	.10	.10(3x)	9
Quarters	x + 2	.25	.25(x + 2)	5
			2.30	

Notice that column two times column three equals column four (total). Also, column four adds up to the final total ($2.30). This gives your equation.

Equation

.05x + .10(3x) + .25(x + 2) = 2.30

or* 5x + 10(3x) + 25(x + 2) = 230 *

5x + 30x + 25x + 50 = 230

60x + 50 = 230

-50 -50

$\frac{60x}{60} = \frac{180}{60}$

so… x = 3 (nickels)

and 3x = 9 (dimes)

and x + 2 = 5 (quarters)

Example (Investment): Sue invested eight times as much at 6% as she did at 4%. Her investments earned a total of $104.00 this year. How much did she invest at each level? Sentence one tells you the "items" you have (6% and 4%) and what the relationship is (You know nothing about her 4% investment, so it is the "x"). Number two tells you the total of her investments ($104.00). The last sentence gives you your task: find two answers – both of the investments.

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Item	How Much	Math Value	Total Value	Solution
6%	8x	.06	.06(8x)	$1600
4%	x	.04	.04x	$200
			104.00	

Equation

.06(8x) + .04x = 104.00

or* 6(8x) + 4x = 10400

48x + 4x = 10400

$\frac{52x}{52} = \frac{10400}{52}$

so… x = 200 (4%)

and 8x = 1600 (6%)

Summary: Choose the one you know nothing about to become your main variable (x). The other unknowns can be written in terms of this one.

If you have two terms and don't know either of them, but you do know the total, let either of them be "x" and let the other one be the total minus x. Example: if two ages add up to 60, then one person is "x" and the other is "60 – x."

Modify this table format to fit the problems you have and your style of learning. Visual aids work better when you feel they relate to you.