Setting Up Different Types of Word Problems

1. **DISTANCE: there are three different types of problems involving distance:**

    Distance:

	rate	×	time	=	distance
1st		×		=	
2nd		×		=	

    A: When distances are equal, set $d_1 = d_2$.

    B: When a total distance is given, set $d_1 + d_2 = $ total distance.

    C: If one distance is less than the other, add the difference to the shorter distance when making an equation.

    D: For vehicle and wind or water current, state the vehicle speed first, then $\pm$ current speed.

    Rate:

	distance	÷	time	=	rate
1st		÷		=	
2nd		÷		=	

    A: When rates are equal, set $r_1 = r_2$.

    Time:

	distance	÷	rate	=	time
1st		÷		=	
2nd		÷		=	

    A: When times are equal, then $t_1 = t_2$.

    B: When total time is given, $t_1 + t_2 = $ total time.

2. **INTEREST – INVESTMENT TYPE PROBLEMS:**

	principle	×	rate	×	time	=	Interest
1st		×		×		=	
2nd		×		×		=	

    A: Time is usually calculated in years.

    B: If time is not in years, check to see if the rate is annual, monthly or daily. Then convert the time so it is in the same increment as the rate, even if this means working with fractions.

    C: If the interests yielded are the same, then $I_1 = I_2$.

    D: If a total amount of interest is given, add the two interests together: $I_1 + I_2 = $ total interest.

    E: If one interest is more than another: $I_1 + $ difference $ = I_2$.

    (Notice the similarities between the distance and investment problems.)

3. **NUMBER PROBLEMS:**

    A: Translate and solve. Remember: the word "and" is used to separate the information on each side of the operation symbol $(+, -, \times, \div)$.

    B: Consecutive integers

1. Consecutive	2. Consecutive; Odd or Even
$x = $ 1st integer	$x = $ 1st integer
$x + 1 = $ 2nd integer	$x + 2 = $ 2rd integer
$x + 2 = $ 3rd integer	$x + 4 = $ 3rd integer

    C: Formulas
    1. Write the formula.
    2. Insert the known information.
    3. Solve for the unknown.

4. **PROBLEMS DEALING WITH MONEY OR VALUE MIXTURES:**

	number of items	$\times$	value per item	$=$	total value of each kind
1st kind of item		$\times$		$=$	
2nd kind of item		$\times$		$=$	
Mixture (if appl.)		$\times$		$=$	total value of the different items.

    Add both totals together and set this sum equal to the total value given.

5. **SOLUTION/MIXTURE TYPE PROBLEMS:**

	volume amount	$\times$	% pure	$=$	Amount pure
beginning mixture		$\times$		$=$	
amount being added		$\times$		$=$	
amount of final mixture		$\times$		$=$	

    A: The sum of the first two relationships gives the third.
    B: In reality, the bottom line is the equation to be solved.

    (Notice the similarities between money, mixture and solution problems.)

6. **WORK OR FILLING PROBLEMS:** (These problems are always written in fractions)

	time alone $\Rightarrow$ rate of work $= \dfrac{1}{\text{time alone}}$	$\times$	time worked	$=$	part of task completed
1st		$\times$		$=$	p_1
2nd		$\times$		$=$	p_2

    A: If the task is completed, the sum of the parts must equal $(p_1 + p_2 = 1)$.
    B: If the task is not completed, then the sum is equal to that part of the task.
    C: If the two objects or people are working against each other, then the parts are subtracted according to instructions.