

Word Problems Hints

Integers or Number problems:

English Phrase	Algebraic Expression
A number multiplied by 17	$17x$
Six subtracted from 5 times a number	$5x - 6$
The quotient of 12 and a number, decreased by 5 times the number	$\frac{12}{x} - 5x$
Two consecutive numbers total 145. Find the two numbers.	$X + (X + 1) = 145$
Three consecutive odd numbers total 51. Find the three #s.	$X + (X+2) + (X+4) = 51$
Three consecutive even numbers total 24. Find the three #s.	$X + (X+2) + (X+4) = 24$

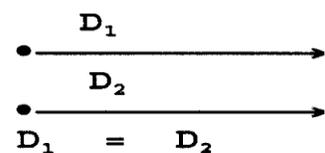
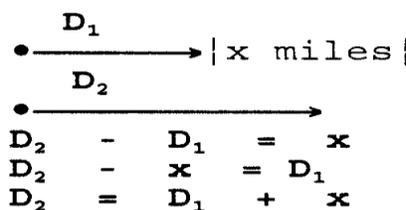
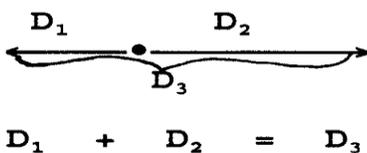
Rate • Time = Distance

$$(R)(T) = D \text{ or } D/R = T \text{ or } D/T = R$$

D = R x T

D 1			
D 2			

- i. record any data about rates and times
- ii. fill the distance box by multiplying **R x T**  
**DO NOT** use the distance numbers in this box
- iii. Once you: have expressed the distance with a rate x time symbol, add (if looking for the total distance), subtract (one option when one distance exceeds the other) or make the expressions equal (when the distances are the same)



Alan and Don are cyclists. Alan averages 11 miles per hour and Don averages 14 miles per hour. They start from TVI at the same time and travel in opposite directions. After how long will they be 100 miles apart?

$$11x + 14x = 100$$

Albuquerque and Denver are approximately 450 miles apart. A car leaves Albuquerque traveling towards Denver at 70 miles per hour. At the same time, another car leaves Denver traveling at 80 miles per hour. How long will it take for them to meet?

$$70X + 80X = 450$$

## Mixture Word Problems

A chemistry lab experiment calls for the students to work with a 30% sulfuric acid solution. The supply room has 50% and 20% sulfuric acid solutions on hand, how much of each should be mixed to obtain 12 liters of 30% acid solution?

*Think of mixtures as inputs being combined to produce an output:*

$$\begin{array}{c} \text{X} \\ 50\% \end{array} + \begin{array}{c} (12-X) \\ 20\% \end{array} = \begin{array}{c} 12 \text{ liters} \\ 30\% \end{array}$$

$$.50X + .20(12-X) = .30(12)$$

How many gallons of fuel costing \$1.89 per gallon must be mixed with 25 gallons of fuel costing \$1.68 per gallon to obtain a mixture costing \$1.75 per gallon?

$$\begin{array}{c} \text{X} \\ 1.89 \end{array} + \begin{array}{c} 25 \\ 1.68 \end{array} = \begin{array}{c} (25+X) \\ 1.75 \end{array}$$

$$1.89X + 25(1.68) = 1.75(25+X)$$

## Simple Interest Problems PRT=I

Your nest egg is \$12000. You want to invest in two stocks one at 6% and the other at 8% annually. How much should be invested at each rate if the total interest earned for the year will be \$890?

$$\begin{array}{c} \text{X} \\ 6\% \end{array} + \begin{array}{c} (12000-X) \\ 8\% \end{array} = \begin{array}{c} \$890 \end{array}$$

$$.06X + .08(12000-X) = \$890$$

You invest \$12000 in two accounts paying 6% and 9% annual interest, respectively. At the end of the year, the accounts earn the *same* interest. How much was invested at each rate?

$$\begin{array}{c} 6\%X \end{array} = \begin{array}{c} 9\%(12000-X) \end{array}$$

$$.06X = .09(12000-X)$$

Ans. 4 hours, 3 hours, 4 liters @ 50%, 8 liters @ 20%, 12.5 gallons, \$3500 @ 6%, \$8500 @ 8%  
\$7200 @ 6%, \$4800 @ 9%