Also known as word problems.

The keys to solving these things are:

1. Identifying the type of problem.
2. Identifying what you are given – which of it is relevant and which of it is not.
3. Identifying what you are looking for.
4. Identifying any equations or formulas needed.
5. Being able to write unknowns in terms of what is known.
6. Translating the information from English to Mathematics.

Translating:

Certain words and phrases translate directly from English to Mathematics.

Take a look at this sentence in English:

One number is 5 less than 3 times another.

To translate:

Step	**Word/Phrase**	**Equation**	**Comments**
1.	another	x	"another" will be our starting variable
2.	3 times	3x	"times" means multiplication
3.	5 less than	3x-5	"less than" means subtract
4.	is	=3x-5	"is" means equals
5.	One number	y=3x-5	"One number" will be our other variable

English to Mathematics Vocabulary

English	**Mathematics**
is	equals
less than, difference	subtract
more than, additional, sum	add
times, of, as much	multiply
per	divide
what, one, another	a variable

Types of Problems

<table>
<tr><td>Simple Interest
Sales tax
Tip
Discount

Total = BaseAmount(1 ± Rate)
Total = BaseAmount ± BaseAmount*Rate</td><td>The variable represents the base amount.
You will be given a rate, usually in percent.
Multiply the base amount by the rate</td></tr>
<tr><td>Mixtures and Concentrations, Coins

$P_1V_1 + P_2V_2 = P_T(V_1 + V_2)$</td><td>The percent of the first times the volume of the first, plus the percent of the second times the volume of the second, equals the total percent times the sum of the volumes.

For coin problems, the percent is the face value of the coin, and the volume is the number of coins.

Special Cases:

1. If you are adding pure water to a mixture, P_2 is 0%.
2. If you are adding pure stuff to a mixture, P_2 is 100%.</td></tr>
<tr><td>Distance, Rate, and Time

<table><tr><th></th><th>rate</th><th>*</th><th>time</th><th>=</th><th>distance</th></tr><tr><td>Person 1</td><td></td><td>*</td><td></td><td>=</td><td></td></tr><tr><td>Person 2</td><td></td><td>*</td><td></td><td>=</td><td></td></tr><tr><td>Total</td><td></td><td>*</td><td></td><td>=</td><td></td></tr></table></td><td>Create a chart, and fill in using the “keys to solving” listed on the previous page.</td></tr>
<tr><td>Time Needed to Do a Job</td><td>$\frac{1}{\text{Time of Person 1}} + \frac{1}{\text{Time of Person 2}} = \frac{1}{\text{Time of Both}}$</td></tr>
</table>