Modeling with Equations

Some story problems are just beautifully laid out to solve with a little bit of algebra. Many people (especially adults) view story problems with some alarm. Throw in algebra, too, and even more people get nervous. But there is a recipe to follow that often works, and it isn't hard.

1. Recognize whether the problem will be nicely modeled with algebra. This is often the hardest step. I use equations when there are quantities, both known and unknown, and mathematical relationships between them.

2. Decide what you're trying to find. This information is usually contained in the question at the end of the problem.

3. Use variables to name your unknown(s), and write down what they stand for. This step is often forgotten, but it's very important. I recommend that you use letters that remind you of what they stand for, so N for the number of nickels, or P for the number of hours Paul works. (Of course, you may use x and y if you prefer them!) And remember, each variable represents a *quantity*. So P can be the number of hours Paul works, but P can't be "Paul."

4. To find the equation(s), translate directly, word for word. Math is a language, like English or French. One reason that story problems are so difficult is that they're written in a foreign language (English); you need to translate into math in order to solve them. To help in your translation, remember that forms of the English word "to be" correspond to equals signs. If you're unsure of an equation, use numbers to check the pattern.

5. Once you have an equation, solve it.

6. Check that your answer makes sense. This is another important step that is often left out. Be sure you've answered the question (were you supposed to find the number of nickels or the amount of money?). And check your answer, both in your original equations and in the original story.

7. Write your answer in an English sentence. If you were taking a beginning French class, you'd probably answer an essay question by translating it into English, answering it, and then translating your answer back to French. When using equations to model a problem, you translate the English into math, solve the math, and then translate back into English.