

Tackling Word Problems

How do you feel when you see word problems in your math text book? If you are like most students, you experience a certain level of anxiety when working through word problems. The good news is that you can learn to break down the information in word problems and translate from the English words on the page to the math you will need to use to solve the problem.

George Polya, a Hungarian mathematician in the early part of the 20th century, devised a four step process for understanding and solving word problems. The four steps are:

- 1. Understand the problem.**
- 2. Devise a plan.**
- 3. Carry out the plan.**
- 4. Look back.**

Understand the Problem

The first thing you should do is read the problem in its entirety. Don't make the mistake of reading part of the problem and assuming you know what it is asking of you. The first time you read through the problem you are trying to gain an overall understanding of the context of the problem and the question that is being asked. After you have the overall understanding of the problem, read it through again looking for more detail.

Notice you have not written anything yet. All you should do at first is read the problem and try to understand it. Only after you have fully read the problem for understanding should you pick up your pencil and start to write.

Devise a Plan

As you begin to devise a plan for solving your word problem, It is helpful to look for similarities between the problem you are given and any previous word problems that you have solved. Not only will this help you to decide how to solve the problem at hand, but it will increase your confidence level if you have already successfully solved a similar problem.

Your instructor may have specific instructions for what you need to do for word problems. If he or she has given you a format to follow, do what he or she has asked you to do. If not, here is a method that may help you to work through the problem.

1. Write a “GIVEN” statement. You will write the word GIVEN and then write down the information in the problem that you have which will help you to solve the problem.

2. Write a “FIND” statement. You will write the word FIND and then write down the question that you are being asked.

3. Sometimes a problem can be represented by a picture. If this is the case with your word problem, make a drawing and label it with any information you know. Also label the parts of the drawing as unknown if you do not yet have the information.

4. If you are at a level of math where you will be using variables and equations to solve word problems, the next step is to write a “LET” statement. You will write the word LET and then assign a variable name to an unknown. Often the unknown will come straight from your FIND statement.

5. Now you need to look at your GIVEN and FIND statements and see what the relationship is between what you know and what you are looking for. This is the step that takes a lot of practice. Don’t expect to master word problems overnight. There are often specific clue words in the problem that will help you know what operation you should use. This chart of key words may help you:

Addition	Subtraction	Multiplication	Division	Equality
Sum	Difference	Product	Quotient	Equals
Plus	Minus	Times	Divide	Is equal to
Added to	Subtract	Multiply	Shared equally	Is/was
More than	Less than	Multiply by	Among	Yields
Increased by	Decreased by	Of	Divided by	
Total	Less	Double/triple	Divided into	

Taken from Basic College Mathematics by Elayn Martin-Gay

Carry Out the Plan

Now that you have assigned a variable and decided what operations or processes you might use, it is time to go ahead and write your equation and solve it or otherwise do the math necessary to solve the problem. Different types of problems will require different work at this step.

Make sure that whatever math you do in this step is neat and easy to follow. If it isn't you won't be able to do the last step of this process (look back) and your teacher will have a challenge grading your work.

Look Back

The final step of this process is to look back at what you have done. Look at your final statement and make sure that you did indeed find what you were asked to find. Check all of your work. The most important component of this step is to make sure that your answer is reasonable. For instance, you can't have a length that is negative, and you might question yourself if you are finding the height of a person and your answer is twelve feet tall. Perhaps you could estimate your answer and you can confirm that the actual answer is close to that estimate. All of these things strengthen your confidence in your answer and help you to be a better problem solver.

