

Math Word Problem Solving Tips From An Experienced Math Tutor

As a teacher and math tutor, I have seen many students struggle with solving word problems. Who of us doesn't remember being asked questions about 2 trains leaving different stations at different speeds, and being asked to figure out when they will meet? While some of us love these types of problems, many others have great difficulty tackling these sorts of questions. Often we just don't know where to begin, or what strategies we should be using to try to find an answer.

This article is intended to help people who struggle with word problems, by providing them with a strategic approach and a set of tools to use when encountering questions of this sort. Like most writings on problem solving, this article leans heavily on the ideas and writings of George Polya (1887-1985) a mathematician who refined many of the ideas for problem solving that are in common use today. His classic book 'Solve It' is a must read for the advanced student – a simplified system is provided below:

An Approach to Problem Solving:

Start by being sure that you understand the problem – I can't tell you the number of times that teachers see students turn in copious amounts of work that fails to answer the question that was actually asked. This is often heartbreaking for both the student and the teacher.

Always try to restate the problem in your own words. If you can't rephrase the problem, then there is a good chance that you may not fully understand it.

Be clear on what you need to accomplish. Think about what information you will need. Is there any information missing? Can it be found by using the information that is present?

Make a plan – once you are confident that you know what the question is asking and what data will be needed to answer it, start thinking about how you will tackle the problem

Think about if you have seen a similar question before. If so, how did you solve it?

Solve a simpler problem – if some parts of the problem are not clear try simplifying it and solving what you know. This is a form of 'divide and conquer' – once you have solved a part of the problem it is not uncommon for the answer to the mysterious part to suddenly jump out at you. You can also try simplifying the data – if the numbers are too big and awkward then make them smaller and simpler. This allows you to get clear on the steps and processes involved in solving the problem.

Draw a picture – often using a diagram will help to organize the data in a way that allows your brain to create additional connections between the pieces and possibly spark some ideas.

List your data – can you put it in a table? Can you organize it?

Can you spot a pattern?

Do you know a formula? Are there any formulas that you know that could be relevant to the problem? Think about how you could possibly use them in this particular instance.

Can you work backwards? Sometimes approaching a problem in the other direction can cause your mental light bulb to turn on!

Guessing is great! Take a guess if you can and then check if your guess is close. Many of us adults were taught never to guess when we were in school – this is unfortunate as guessing and estimation are powerful problem solving tools.

Carry out your plan – you've got your plan so now it's time to execute it. Use one of the approaches above that you think fit the situation best. Don't be afraid to drop one approach and try another if you don't seem to be making headway.

Look back – is there another method? Could you solve it a different way? Is there a general principle that can be applied?

About the Author:

Ian Cunliffe is an experienced tutor and teacher serving North and West Vancouver, BC. Ian can be reached at ian@vancouver tutoring service.com or at 778 230 0177. Check out his website at <http://www.vancouver tutoring service.com>

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