Why Learn Algebra?

"Why study algebra?" If you're a parent, it's a question that you will no doubt hear as your children study the subject. If you're a student, it is a very natural question to ask, "What's the point of learning algebra in the first place?"

After all, all of the math leading up to algebra that we learned growing up such as addition, multiplication, decimals, fractions, and the like, seem to have a concrete meaning. These concepts all deal with numbers in some way or another and because of this we can wrap our brains more easily around the concepts. After all, I can pick up six pencils and give two to a friend and by using math I can figure out how many pencils I am left holding in my hand. We can all imagine situations where basic math serves us well - calculating your change in the grocery store for instance.

In short, basic math deals with numbers. Since we are all taught how to count at a young age the concepts of basic math, even though challenging at first, seem to have a practical value - even to children.

Enter Algebra. Suddenly, we are asked to deal not only with our comfortable numbers but with letters. And it doesn't stop with this. You start seeing parenthesis and exponents, and a whole potpourri of other symbols that seem to make no sense at all. This single fact more than any other turns many people off to learning algebra. At the very beginning you are asked to learn certain rules on how to calculate things in algebra. You must learn which steps are legal to do before others, and if you do them in the reverse order you get the wrong answer!

This leads to frustration. With frustration, despair follows in short order. And so the thoughts begin: "Why do I need to learn this?" "When would I ever use Algebra in real life?"

What you have to remember, though, is that basic math is riddled with special rules and symbols as well. For example, the symbols "+" and "=" were at one time foreign to us all. In addition the concept of adding fractions, as a single example, is filled with special rules that we must learn. When adding 1/3 to 1/3, for example, you keep the common denominator and add the

numerators, so that 1/3 + 1/3 = 2/3. The point here is that when you begin to learn algebra it may seem overwhelming with the rules that you must learn, but this is no different from the multitude of rules that you had to learn that dealt with basic math such as addition and subtraction.

Learning Algebra is achievable for all, you just need to take things one step at a time and learn the basic rules before moving on to more advanced topics.

But this does not answer the question of "Why should I learn Algebra?" This is a difficult question, but the simplest answer is that Algebra is the beginning of a journey that gives you the skills to solve more complex problems.

What types of problems can you solve using only the skills you learned in Algebra? I invite you to take a journey with me back to your childhood. We've all been to the playground and had a great time on the see-saw, the merry-go-round, and the slide. At one time all of us were completely fascinated with these trips to the playground, but Algebra can help you understand them. The physics of all of these playground toys can be completely understood using only Algebra. No Calculus required. For example, if you knew the weight of a person at the top of the slide and you knew the height of the slide you could roughly calculate how fast you would be traveling as you exited the bottom of the slide.

On the see-saw, let's say that a person was sitting at one end and you knew that person's weight. You'd like to sit on the other side of the see-saw, but not at the very end - you'd like to sit opposite your partner in the middle between the seat and the pivot point. Using algebra, you could calculate how heavy you'd have to be to exactly balance the see-saw.

Moving away from playground equipment, as children we were all fascinated with the magical way that magnets attract each other. Using algebra, you could calculate how much force a given magnet would pull on another magnet.

There are examples all around us of things in the everyday world that you could fully understand using only the tools in algebra. If you drop a rock off of the roof of a house, how long would it take

to hit the ground? If you dropped a second rock 100 times as heavy off of the roof of the same house, how long would it take to hit the ground? If you somehow brought a bulldozer up to the roof of the house and dropped it, how long would it take for the bulldozer to hit the ground? The answer in all three cases it takes the same amount of time to hit the ground! The time of free-fall depends only on the Earth's gravitational field (which is the same for us all) and the height of the roof you drop from. Even though the bulldozer is "heavier" than the rocks, they all fall at the same rate to the ground.

Most people would assume that learning about more "advanced" topics such as rocket propulsion and Einstein's theory of Relativity would require much more advanced math than Algebra. It is true that more advanced math is necessary to understand every facet of these and other advanced topics. However, many of the fundamental principles can be understood using only the tools in algebra. For example, the equations that describe how a spacecraft orbits the Earth only involve algebra.

Moreover, many of the central topics in Einstein's theory of special relativity can be understood only using algebra. For example, it turns out if you are traveling on a spaceship near the speed of light time actually slows down for you relative to your friends back on Earth. In other words, if you were to fly in a spaceship near the speed of light for some time and then you returned to Earth, you would find that you had aged very little while your friends on Earth have aged a great deal! Albert Einstein coined this phenomenon "time dilation" and it can easily be calculated using only Algebra. This effect is not a theoretical effect - it has actually been measured many times. In fact, the GPS system of satellites in the sky that the military and police forces depend on must take into account the effects of time dilation or else the system would not work at all! Because the satellites are moving in orbit around the Earth at speeds much smaller than the speed of light, the time dilation involved is very small - but it must be accounted for or the system would not function.

Now, you might be thinking, "I never learned how to calculate things such as this in my algebra class!" This is in fact true. All of the applications we have been talking about here are known as the study of Physics. If you had to boil the word Physics down to one

sentence it would be: "Physics is all about studying the world around us using math as a tool."

Simply put all the math that you ever learn is really a tool for understanding the world around us. And believe me, we have only begun to scratch the surface of understanding how the world works. Algebra is a stepping stone to learning about this wonderful universe that we live in. With it you have the tools to understand a great many things and you also have the skills needed to continue on and learn Trigonometry and Calculus which are essential for exploring other types of problems and phenomena around us.

So, try not to think of Algebra as a boring list of rules and procedures to memorize. Consider algebra as a gateway to exploring the world around us all.

Jason Gibson

www.MathTutorDVD.com

Jason Gibson is the founder of http://www.MathTutorDVD.com, the leading producer of educational math tutorial content on DVD. Jason has earned a BS and MS in Electrical Engineering and a MS in Physics.

Article Source: http://EzineArticles.com/?expert=Jason_Gibson