



How Math Works: A Guide to Grade School Arithmetic for Parents and Teachers

By G. Arnell Williams

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We hear all the time how American children are falling behind their global peers in various basic subjects, but particularly in math. Is it our fear of math that constrains us? Or our inability to understand math's place in relation to our everyday lives? How can we help our children better understand the basics of arithmetic if we're not really sure we understand them ourselves?

Here, G. Arnell Williams helps parents and teachers explore the world of math that their elementary school children are learning. Taking readers on a tour of the history of arithmetic, and its growth into the subject we know it to be today, Williams explores the beauty and relevance of mathematics by focusing on the great conceptual depth and genius already inherent in the elementary mathematics familiar to us all, and by connecting it to other well-known areas such as language and the conceptual aspects of everyday life. The result is a book that will help you to better explain mathematics to your children. For those already well versed in these areas, the book offers a tour of the great conceptual and historical facts and assumptions that most simply take for granted.

If you are someone who has always struggled with mathematics either because you couldn't do it or because you never really understood why the rules are the way they are, if you were irritated with the way it was taught to you with the emphasis being only on learning the rules and "recipes" by rote as opposed to obtaining a good conceptual understanding, then *How Math Works* is for you!

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Editorial Review

Review

How Math Works delivers exactly what it promises: an extremely thorough explanation of numeration and the four basic operations. It's completely fascinating, but information-dense and academic. It could serve as a text for a graduate-level course in the history of arithmetic...All explanations are accompanied by detailed diagrams and multiple methods: a "coin system" (basically enhanced tally marks), an abacus, and written out in Arabic numerals (though you'll learn about Roman numerals, too). Learn how ancient Egyptians multiplied using doubling charts. It's pretty amazing. If you've always wanted to understand math but never quite grasped it, this book can help you see how the numbers dance. (*Tulsa Book Review*)

Williams is a huge fan of using diagrams and pictures along with step-by-step breakdowns of each concept he discusses. Williams sets the stage by beginning with the 'coin system,' which is basically the method of tally marks, the abacus, and Arabic numerals. The reader will also obtain an understanding of how the Romans had a difficult time coming to grips with the number zero, negative numbers, and how the Egyptians used doubling charts to multiply numbers. The examples in the book are simple to understand yet the history is more complex. When reading the book, the reader is sent on a journey through history that is compelling and downright fun. (*Mathematical Association of America*)

I don't know about you but I honestly have to admit that Math confuses me at times! As a Homeschool parent, I find that often it seems like Greek language to me. I have struggled with Math since high school and now that my son is 10, I feel that I need to have a better understanding of Math. Thanks to *How Math Works* by G. Arnell Williams I do feel like I at least have a better understanding of Math. I love that the book explains the history of arithmetic and the author connects it to other areas such as language which is a subject I love. My son enjoyed learning more about numbers and how they came about and I honestly feel that I now am more capable of explaining Math to my son. I'm still not an expert in the subject, but it would take a lot for me to accomplish that goal. I do like that this book was also interesting to read and I highly recommend it to all parents and teachers. Math no longer seems like a complicated and boring subject to me. This book truly has helped me to see the beauty in Math and that is a big accomplishment! (*Home Education Magazine*)

This guide outlines the rich history of math by answering how it formed and how it functions. Williams clearly articulates how math was founded through relationship patterns using symbols such as tally marks, abacus tables, and Hindu - Arabic (numeral) methods. He writes about how necessary these methods are when teaching foundational algorithms in elementary school classrooms. As an elementary school math teacher, I recommend this book for those who are curious about math and are interested in knowing more about its history and how it works. (*Teaching Children Mathematics*)

What are numbers? Where did our numbers come from? And why do we calculate with them the way we do? This entertaining, well-written, and instructively illustrated book is a mine of information for anyone (children, parents, teachers, etc.) fascinated by such questions. (Robin Wilson, emeritus professor of pure mathematics, Open University Pembroke College, Oxford)

About the Author

G. Arnell Williams (MS Yale) is an associate professor of mathematics at San Juan College in New Mexico. He has won numerous teaching awards for helping people to overcome their fear of math.

Users Review

From reader reviews:

Patricia Smith:

Book is to be different per grade. Book for children until finally adult are different content. As we know that book is very important normally. The book *How Math Works: A Guide to Grade School Arithmetic for Parents and Teachers* seemed to be making you to know about other knowledge and of course you can take more information. It doesn't matter what advantages for you. The reserve *How Math Works: A Guide to Grade School Arithmetic for Parents and Teachers* is not only giving you a lot more new information but also to become your friend when you truly feel bored. You can spend your current spend time to read your reserve. Try to make relationship with all the book *How Math Works: A Guide to Grade School Arithmetic for Parents and Teachers*. You never truly feel lose out for everything should you read some books.

Paul Heisler:

Playing with family in a very park, coming to see the water world or hanging out with close friends is thing that usually you have done when you have spare time, subsequently why you don't try thing that really opposite from that. One particular activity that make you not experiencing tired but still relaxing, trilling like on roller coaster you are ride on and with addition details. Even you love *How Math Works: A Guide to Grade School Arithmetic for Parents and Teachers*, you could enjoy both. It is excellent combination right, you still want to miss it? What kind of hangout type is it? Oh can occur its mind hangout fellas. What? Still don't understand it, oh come on its called reading friends.

Robert Stitt:

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Jason Caldwell:

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