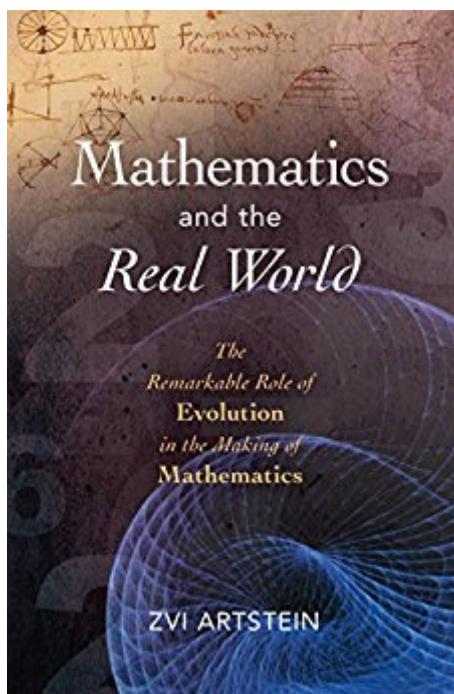


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# Mathematics And The Real World: The Remarkable Role Of Evolution In The Making Of Mathematics



## Synopsis

In this accessible and illuminating study of how the science of mathematics developed, a veteran math researcher and educator looks at the ways in which our evolutionary makeup is both a help and a hindrance to the study of math. Artstein chronicles the discovery of important mathematical connections between mathematics and the real world from ancient times to the present. The author then describes some of the contemporary applications of mathematics—in probability theory, in the study of human behavior, and in combination with computers, which give mathematics unprecedented power. The author concludes with an insightful discussion of why mathematics, for most people, is so frustrating. He argues that the rigorous logical structure of math goes against the grain of our predisposed ways of thinking as shaped by evolution, presumably because the talent needed to cope with logical mathematics gave the human race as a whole no evolutionary advantage. With this in mind, he offers ways to overcome these innate impediments in the teaching of math.

## Book Information

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## Customer Reviews

The true mark of a masterpiece is that it makes you think, regardless of the amount of new facts that it teaches you. I just finished reading Zvi Artstein's new book Mathematics and the Real World, the Remarkable Role of Evolution in the Making of Mathematics, and it sure made me think! I already "knew" most of the content of Artstein's book, but I still could not lay it down. It is a real page-turner! The engaging, often humorous, way that he presents the highlights of current mathematical knowledge, and attitudes, should appeal to a very wide audience, from the "educated layman" (even those who dislike math and science) all the way to Abel and Nobel prize winners. He touches on so many subjects, even social science, economics, and finance, yet he starts at the very beginning, with the cave-dwellers, and in fact even "lower", with mathematical abilities of animals. But the main significance of this amazing one-in-a-generation summing-up of current mathematical knowledge (the Davis-Hersh "Mathematical Experience", ca. 1980, comes to mind, and also Poincaré's "Science and Method", ca. 1910) is in finally explaining Barbie's complaint Math is so hard and not only to "bimbos" like Barbie, but even to nerds like us. Precise mathematical thinking is so unnatural, since evolution did not prepare us to tackle it, and it is amazing that in spite of this fact, we went quite a long way. But if you take Artstein's message seriously, it could have far-reaching implications, on how to improve our mathematical teaching, to both future mathematicians, and, even more importantly, future scientists (both physical and social), and even Joe the plumber! I found the concluding chapter, on education, particularly insightful, and it gave me hope that if we take Artstein's lessons seriously, we have a chance to teach math naturally, and win over the 99 percent of humankind who (openly!) hate math. So let's get to work! As a modest first step, I figured out much better ways to prove that the square-root of 2 is irrational. I also have some remarks and short errata. I am looking forward to reading this masterpiece at least two more times!

Very nice coverage of math for math lovers. Artstein makes interesting observations on the development of mathematical principles based on their history and relationship with the natural world. His analogies with the process of evolution made me think and were, for the most part, a good contribution to the subject. The book handles the more obtuse concepts (of which there are plenty) by explaining them in English and referring the reader to either an appendix or other sources for more detail. It is a good approach for the math lover who wants to understand, not use, these concepts. I found the book enjoyable, especially the history.

This book is an approach very important for understanding the role and the development of the mathematics actually. We can see here as the informatics has generated many technical operations

whom allow us to resolve problems whom before needed biggest calculations. All that is made possible by the strong use of statistics. However this back-ground is completed with an historical analysis which starts in the Greek world and continues after Middle Age with Euler, Leibnitz, Newton. Actually the most important sectors are, next statistics, the game theory and the probability. We must consider with attention the concept of randomness.

I've enjoyed the book. I don't have the advanced math background to appreciate all the subjects covered, but the history of the people who contributed to the development of mathematics is very interesting. I've been reading the Kindle version where the diagrams and formulas are rather tiny. I wish they were bigger.

The content was just what I expected and book was in excellent physical condition.

Interestring history of the mathematical thinking and how this tool helped us see the world. The author points key moments when new concepts appeared, how near / far they are from intuitive thinking and how they changed our understanding of the world around us.

In about 400 pages of main text, the author guides the reader through i) the evolution of mathematics throughout the ages up to modern times, focussing on its usefulness in enhancing human evolution, ii) some uses of mathematics in probability, human behavior, computers, etc., and iii) research and education in mathematics. Throughout the book, some more technical sections are included in smaller print between a pair of parallel lines; the author points out that these may be skipped without loss of continuity or understanding of the main text. I found the book to be well written despite its being translated from Hebrew. The author writes in a very clear, careful and authoritative style thus enhancing the book's accessibility. I believe that the author has lived up to the book's title in focussing on real world mathematics, at least most of the time. A few discussions on more abstract mathematical concepts with no obvious practical applications have been included. However, the author correctly points out that many mathematical objects that were developed/discovered in the past with no practical uses at the time have eventually found applications in the physical world and continue to do so. The only shortcoming that I found in this book pertains to the author's technical sections. I found several of these to be less than clear. For example, the Monty Hall problem is briefly discussed. I recommend that anyone wanting to learn about this problem, its history, its controversy and its

solution should look elsewhere; the discussion given here was not at all clear compared to other sources. Overall, I found this to be quite an enjoyable book. It will likely appeal mainly to mathematics enthusiasts and teachers but highly interested/motivated general readers could also learn much from it.

Best book I've ever read on Math or science. Especially important for math teachers at all levels.

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