



A Mind for Numbers: How to Excel at Math and Science (Even If You Flunked Algebra)

By Barbara Oakley

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Whether you are a student struggling to fulfill a math or science requirement, or you are embarking on a career change that requires a higher level of math competency, *A Mind for Numbers* offers the tools you need to get a better grasp of that intimidating but inescapable field. Engineering professor Barbara Oakley knows firsthand how it feels to struggle with math. She flunked her way through high school math and science courses, before enlisting in the army immediately after graduation. When she saw how her lack of mathematical and technical savvy severely limited her options—both to rise in the military and to explore other careers—she returned to school with a newfound determination to re-tool her brain to master the very subjects that had given her so much trouble throughout her entire life.

In *A Mind for Numbers*, Dr. Oakley lets us in on the secrets to effectively learning math and science—secrets that even dedicated and successful students wish they'd known earlier. Contrary to popular belief, math requires creative, as well as analytical, thinking. Most people think that there's only one way to do a problem, when in actuality, there are often a number of different solutions—you just need the creativity to see them. For example, there are more than three hundred different known proofs of the Pythagorean Theorem. In short, studying a problem in a laser-focused way until you reach a solution is not an effective way to learn math. Rather, it involves taking the time to step away from a problem and allow the more relaxed and creative part of the brain to take over. *A Mind for Numbers* shows us that we all have what it takes to excel in math, and learning it is not as painful as some might think!

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Editorial Review

Review

“A good teacher will leave you educated. But a great teacher will leave you curious. Well, Barbara Oakley is a great teacher. Not only does she have a mind for numbers, she has a way with words, and she makes every one of them count.”

—**Mike Rowe, creator and host of Discovery Channel’s “Dirty Jobs” and CEO of mikeroweWORKS**

“If you struggled through math and slept through science, there’s hope. In *A Mind for Numbers*, polymath Barbara Oakley reveals how to unlock the analytic powers of our brains so we can learn how to learn. This book should be required reading for students—and for my mother.”

—**Adam Grant, *New York Times*-bestselling author of *Give and Take***

“Superb not only for those who are struggling or who are expert at math, but for readers who wish to think and comprehend more efficiently.”

—***Library Journal***

“An ingeniously accessible introduction to the science of human cognition—along with practical advice on how to think better.”

—**James Taranto, *The Wall Street Journal***

“In my book *The Math Instinct*, I described how we have known since the early 1990s that all ordinary people can do mathematics, and in *The Math Gene*, I explained why the capacity for mathematical thinking is both a natural consequence of evolution and yet requires effort to unleash it. What I did not do is show *how* to tap in to that innate ability. Professor Oakley does just that.”

—**Keith Devlin, NPR Weekend Edition’s “Math Guy”**

“A wonderful book! How do you come to *love* math and science, and how do you come to *learn* math and science? Read *A Mind for Numbers*. Barbara Oakley is the magician who will help you do both.”

—**Francisco J. Ayala, University Professor and Donald Bren Professor of Biological Sciences, University of California, Irvine, and former President and Chairman of the Board, American Association for the Advancement of Science**

“Being good at science and mathematics isn’t just something you *are*; it’s something you *become*. This users’ guide to the brain unmask the mystery around achieving success in mathematics and science. I have seen far too many students opt out when they hit a rough patch. But now that learners have a handy guide for ‘knowing better’ they will also be able to ‘do better.’”

—**Shirley Malcom, Head of Education and Human Resources Programs, American Association for the Advancement of Science**

“*A Mind for Numbers* is an excellent book about how to approach mathematics, science, or any realm where problem solving plays a prominent role.”

—**J. Michael Shaughnessy, Past President of the National Council of Teachers of Mathematics**

“I have not been this excited about a book in a long time. Giving students deep knowledge on *how to learn* will lead to higher retention and student success in every field. It is a gift that will last them a lifetime.”

—**Robert R Gamache, Ph.D., Associate Vice President, Academic Affairs, Student Affairs, and International Relations, University of Massachusetts, Lowell**

"A *Mind for Numbers* helps put students in the driver's seat—empowering them to learn more deeply and easily. This outstanding book is also a useful resource for instructional leaders. Given the urgent need for America to improve its science and math education so it can stay competitive, *A Mind for Numbers* is a welcome find."

—**Geoffrey Canada, President, Harlem Children's Zone**

"It's easy to say 'work smarter, not harder,' but Barbara Oakley actually shows you how to do just that, in a fast-paced and accessible book that collects tips based on experience and sound science. In fact, I'm going to incorporate some of these tips into my own teaching."

—**Glenn Harlan Reynolds, Beauchamp Brogan Distinguished Professor of Law, The University of Tennessee**

"A *Mind for Numbers* is a splendid resource for how to approach mathematics learning and in fact learning in any area. Barbara Oakley's authoritative guide is based on the latest research in the cognitive sciences, and provides a clear, concise, and entertaining roadmap for how to get the most out of learning. This is a must-read for anyone who has struggled with mathematics and anyone interested in enhancing their learning experience."

—**David C. Geary, Curators' Professor of Psychological Sciences and Interdisciplinary Neuroscience, University of Missouri**

"For students afraid of math and science and for those who love the subjects, this engaging book provides guidance in establishing study habits that take advantage of how the brain works."

—**Deborah Schifter, Principal Research Scientist, Science and Mathematics Programs, Education Development Center, Inc.**

"A *Mind for Numbers* explains the process of learning in a fascinating and utterly memorable way. This book is a classic, not only for learners of all ages, but for teachers of all kinds."

—**Frances R. Spielhagen, Ph.D., Director, Center for Adolescent Research and Development, Mount Saint Mary College**

About the Author

Barbara Oakley is a professor of engineering at Oakland University in Rochester, Michigan. She has received many awards for her teaching, including the coveted National Science Foundation New Century Scholar Award.

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Thomas Edison is one of the most prolific inventors in history, with over one thousand patents to his name. *Nothing* got in the way of his creativity. Even as his lab was burning to the ground in a horrific accidental fire, Edison was excitedly sketching up plans for a new lab, even bigger and better than before. How could Edison be so phenomenally creative? The answer, as you'll see, relates to his unusual tricks for shifting his mode of thinking.

Shifting between the focused and diffuse modes

For most people, shifting from focused to diffuse mode happens naturally if you distract yourself and then allow a little time to pass. You can go for a walk, take a nap, or go to the gym. Or you can work on

something that occupies other parts of your brain: listening to music, conjugating Spanish verbs, or cleaning your gerbil cage *The key is to do something else until your brain is consciously free of any thought of the problem.* Unless other tricks are brought into play, this generally takes several hours. You may say – *I don't have that kind of time.* You do, however, if you simply switch your focus to other things you need to do, and mix in a little relaxing break time.

Creativity expert Howard Gruber has suggested that one of the three "B's" usually seems to do the trick: the bed, the bath, or the bus One remarkably inventive chemist of the mid-1800s, Alexander Williamson, observed that a solitary walk was worth a week in the laboratory in helping him progress in his work. (Lucky for him there were no smartphones then.) Walking spurs creativity in many fields; a number of famous writers, for example, including Jane Austen, Carl Sandburg, and Charles Dickens, found inspiration during their frequent long walks.

Once you are distracted from the problem at hand, the diffuse mode has access and can begin ping-pong about in its big-picture way to settle on a solution. After your break, when you return to the problem at hand, you will often be surprised at how easily the solution pops into place. Even if the solution doesn't appear, you will often be further along in your understanding. It can take a lot of hard, focused mode work beforehand, but the sudden, unexpected solution that emerges from the diffuse mode can make it feel almost like the "Ah-hah!" mode.

Users Review

From reader reviews:

Blanche Watson:

Reading a e-book tends to be new life style within this era globalization. With examining you can get a lot of information that will give you benefit in your life. Along with book everyone in this world can share their idea. Guides can also inspire a lot of people. Lots of author can inspire their particular reader with their story or their experience. Not only the storyplot that share in the books. But also they write about the information about something that you need example of this. How to get the good score toefl, or how to teach children, there are many kinds of book that you can get now. The authors on earth always try to improve their expertise in writing, they also doing some exploration before they write for their book. One of them is this A Mind for Numbers: How to Excel at Math and Science (Even If You Flunked Algebra).

Bernard Kovach:

Precisely why? Because this A Mind for Numbers: How to Excel at Math and Science (Even If You Flunked Algebra) is an unordinary book that the inside of the book waiting for you to snap that but latter it will shock you with the secret that inside. Reading this book adjacent to it was fantastic author who all write the book in such incredible way makes the content interior easier to understand, entertaining way but still convey the meaning entirely. So , it is good for you because of not hesitating having this anymore or you going to regret it. This amazing book will give you a lot of advantages than the other book have such as help improving your ability and your critical thinking technique. So , still want to delay having that book? If I were you I will go to the e-book store hurriedly.

Scott Padilla:

Playing with family in a very park, coming to see the coastal world or hanging out with close friends is thing that usually you have done when you have spare time, in that case why you don't try issue that really opposite from that. Just one activity that make you not feeling tired but still relaxing, trilling like on roller coaster you are ride on and with addition of knowledge. Even you love A Mind for Numbers: How to Excel at Math and Science (Even If You Flunked Algebra), you are able to enjoy both. It is good combination right, you still need to miss it? What kind of hang type is it? Oh seriously its mind hangout fellas. What? Still don't understand it, oh come on its identified as reading friends.

Molly Salazar:

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