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# Guesstimation: Solving The World's Problems On The Back Of A Cocktail Napkin



## Synopsis

Guesstimation is a book that unlocks the power of approximation--it's popular mathematics rounded to the nearest power of ten! The ability to estimate is an important skill in daily life. More and more leading businesses today use estimation questions in interviews to test applicants' abilities to think on their feet. Guesstimation enables anyone with basic math and science skills to estimate virtually anything--quickly--using plausible assumptions and elementary arithmetic. Lawrence Weinstein and John Adam present an eclectic array of estimation problems that range from devilishly simple to quite sophisticated and from serious real-world concerns to downright silly ones. How long would it take a running faucet to fill the inverted dome of the Capitol? What is the total length of all the pickles consumed in the US in one year? What are the relative merits of internal-combustion and electric cars, of coal and nuclear energy? The problems are marvelously diverse, yet the skills to solve them are the same. The authors show how easy it is to derive useful ballpark estimates by breaking complex problems into simpler, more manageable ones--and how there can be many paths to the right answer. The book is written in a question-and-answer format with lots of hints along the way. It includes a handy appendix summarizing the few formulas and basic science concepts needed, and its small size and French-fold design make it conveniently portable. Illustrated with humorous pen-and-ink sketches, Guesstimation will delight popular-math enthusiasts and is ideal for the classroom.

## Book Information

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## Customer Reviews

"Dr. Adam and his colleague Lawrence Weinstein, a professor of physics, offer a wide and often amusing assortment of Fermi flexes in a book that just caught my eye, *Guesstimation: Solving the World's Problems on the Back of a Cocktail Napkin*."--Natalie Angier, *New York Times*"An important skill of great use . . . is the ability to derive an approximate result from insufficient data.

*Guesstimation* is a collection of [problems] gathered from everyday life and various fields. Working out questions . . . is both entertaining and enlightening. It may also help foster your career . . . because making correct guesses quickly establishes your reputation as an expert."--Stephan

Mertens, *Science*"This book is a stimulating collection that will help the reader to reach informed judgments and will be a useful source of inspiration for mathematics and physics teachers: my only concern is that if my students have read it before they arrive at university, I may have to find a new approach to my first day's teaching."--Tony Mann, *Times Higher Education*"While few can hope to emulate the brilliance of a Nobel Prize winner like [Enrico] Fermi, coming up with pretty good guesstimates is a skill that can be taught. And that's the aim of *Guesstimation*. After a quick tutorial, the authors get down to business with a host of wide-ranging worked examples, from estimating the numbers of piano tuners in Los Angeles to figuring out the impact of deforestation on greenhouse gas levels. The results are sometimes surprising."--Robert Matthews, *BBC Focus*

*Magazine*"[*Guesstimation* is] a left-brain book that helps you approximate answers to the types of questions actually asked in some job interviews today."--Peter Coy, *BusinessWeek*"[A] delightful account of mathematical approximation, which instills the beauty and power of the back-of-the-envelope calculation. The puzzles make addictive confidence builders by breaking down tricky questions into manageable parts. Never again will you take a newspaper figure at face value without feeling the need, and confidence, to guesstimate your own figure."--Matthew Killea, *New Scientist*"*Guesstimation* is both enlightening and entertaining. I recommend it to my fellow journalists both as a tool of our trade and as a mind stretcher."--Rony V. Diaz, *Manila Times*"Any idea what fraction of land in the US is covered by either a roof or pavement? Known as a Fermi problem, this type of question requires the use of reasonable estimation, which is the focus of the book at hand. In the initial chapters, Weinstein and Adam briefly review good 'guesstimation' techniques involving numbers and explain why the use of the geometric mean is preferred over the arithmetic mean."--J. Johnson, *Choice*"How many people in the world are picking their nose right now? Weinstein and Adam 'guesstimate' the answer to this problem and 79 others, covering chemistry, physics, biology and history. The book is a step-by-step guide to problem-solving using rough-and-ready maths, the kind done on the back of a cocktail napkin. And the authors have kindly left additional questions at the end to get readers started on their own problem-solving

expedition."--Cosmos"Physics educators can use this book as a guide to including the important skill of estimation in their courses. Students may find the power of estimation to be a valuable skill and will want to work their way through this book."--Arthur Eisenkraft, American Journal of Physics"A source of imaginative problems, this book would make a nice addition to a mathematics department library."--Diane Resek, Mathematics Teacher"[I]t's quite obvious that the authors intend their book to be fun, nonthreatening, and user-friendly. There's very little not to like. . . . [T]he book can be for everybody, 'higher-up professionals' who might know math but not physics, as well as students wrestling with 'word problems.' Teachers could very well recommend it to math majors and nonmajors alike, or even use it in the classroom, in some cases as supplementary reading for the course."--Marion Deutsche Cohen, Mathematical Intelligencer"The cumulative effect of fairly simple paths to estimating solutions to a dizzying array of difficult problems is fascinating."--Ray Bert, Civil Engineering"This book will be enjoyed by anyone with an interest in estimation, but is also targeted at those applying for jobs at companies like Google, where the kind of questions considered in the book are often used in the interview process."--Paul Taylor, Mathematics Today

"Guesstimation is a delightful book that, page after page, gleams with insight into the measure of all things--from house pets to lottery tickets and from the kitchen to the cosmos. Meanwhile, the authors cleverly teach you some fundamental chemistry, physics, and biology, leaving you enlightened and curiously comfortable with all that once seemed intractable in the world."--Neil deGrasse Tyson, astrophysicist at the American Museum of Natural History, author of Death by Black Hole: And Other Cosmic Quandaries"Wow, I suddenly grasped concepts that have eluded me for a lifetime. If you work anywhere in the professional world and are aiming for the corner office, this little book could have significant impact on both your analytical abilities and the way you are perceived by others. An absolute eye-opener!"--Martin Yate, New York Times best-selling author of the Knock 'Em Dead job-search and career-management books"In a world where we are constantly bombarded with quantitative information (and disinformation) and where implausible factoids become established truths by repetition, acquiring a sound grounding in 'numeric literacy' has almost become a civic duty. Weinstein and Adam show to us that it can also be fun! An extremely useful book--not just for the intelligent layperson, but for virtually everyone: politicians, students, policymakers and, yes, sometimes even physicists."--Riccardo Rebonato, Royal Bank of Scotland, author of Plight of the Fortune Tellers"As well as giving insight into how scientists think, this book packs in more amazing facts than you could shake a stick at. Learn the technique of 'guesstimation' and you will be able to astound your friends at parties, as well as avoid getting ripped off by

misleading advertising claims. You may even be able to work out how many facts you can shake a stick at."--John Gribbin, author of *Deep Simplicity: Bringing Order to Chaos and Complexity*"A very interesting and informative work, showing both how important and how easy it can be to estimate magnitudes. This book will amuse you while it instructs."--Gino Segrè, author of *A Matter of Degrees*"This is definitely my kind of book. The authors show, using numerous examples, how readers can make numerical estimates of quantities--some absurd and some fascinating--in a wide variety of areas. This is a very useful talent--be it in everyday life, in one's career, or in job interviews."--Robert Ehrlich, author of *Eight Preposterous Propositions*"This book will benefit teachers and students in science and engineering, from grade school to college. The problems are well chosen to illustrate increasingly complex themes, culminating in energy conservation, risk assessment, and environmental problems. The solutions are careful, complete, and illuminating. General readers with a taste for mathematical puzzles will enjoy it."--Hans Christian von Baeyer, author of *The Fermi Solution*

This book teaches you how to guess better through systematically, by making assumptions and checking them. Then adjusting those assumptions if the numbers are way off. I find the technique quite useful and I believe schools should teach students how to guess. The issue that I have with the book is that it does not talk much about the limitations of guesses. After all, a guess is slightly better than no answer in a lot of times and also is just a process to think about how you would do it if you had the resources. Also, the author does not talk much about oversimplification. Einstein says things that "Everything should be made as simple as possible, but not simpler." But assumptions in the book, simplify things WAY TOO MUCH! However, despite these two limitations, I strongly recommend this book. Also, I encourage young readers to read this book because it will help you think and teach you to make assumptions, and check the reasonableness of your assumptions.

This book has been a life changer. I always wondered how do CEOs, Product Managers, etc who deal with numbers make guesses that are near perfect. They have this ability to make those guesses. I always wondered how. I stumbled upon this book by chance and the title seemed interesting. I bought this one and it was a life changing experience. This book teaches you how to guess with great accuracy. Amazing. After going through the first few exercises, I started using this skill in everyday life and it works! I was able to surprise people around me with my new found skill. This is an invaluable resource for anyone. You just need to be able to organize the data that you

already know. This book teaches how to do it. I am planning to get the guesstimation 2.0 book too.

Some of us are older than we want to admit and have to get back into math. This book was recommended by a colleague at Johns Hopkins University. So I dove in. It was worth the read. It has softly reintroduced me to mathematical problem solving. The authors were great. Humorists and instructors. If you were hoping to get a review of differential equations... This is not for you. If you want to be reminded of the fun utilities to be found in math, get your copy. I would highly recommend this for guys like me.

The author happens to have been one of my daughters Professors at Old Dominion University and I bought this book out of curiosity. I was pleasantly surprised at how it's written for the layman with even basic math skills can understand the contents. To me it was a fun and informative read. Prof. Weinstein has got a great sense of humor as well.

This book guides you through the process of making estimates. I think the American Journal of Physics used to have these kinds of problems, one of which was to estimate how long it would take for the Earth's oceans to cool by 1 degree (Celsius or Fahrenheit; it makes no difference in order of magnitude one-significant digit calculations) if the sun disappeared today. This is a good skill to have.

Fascinating book that's kept me entertained on many a long boring flights.

loved it

Very cool methods and examples for making estimations in everyday life. Coincidentally, the authors of this book (Weinstein and Adams) have both been my professors

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