

## Outreach Book List - Maths

Maths			
Title of book	Suggested By	Blurb	Review
1 <b>Humble Pi, by Matt Parker</b>	<i>Ela Kemp, Makerspace Leader</i>	What makes a bridge wobble when it's not meant to? Billions of dollars mysteriously vanish into thin air? A building rock when its resonant frequency matches a gym class leaping to Snap's 1990 hit I've Got The Power? The answer is maths. Or, to be precise, what happens when maths goes wrong in the real world. As Matt Parker shows us, our modern lives are built on maths: computer programmes, finance, engineering. And most of the time this maths works quietly behind the scenes, until ... it doesn't. Exploring and explaining a litany of glitches, near-misses and mishaps involving the internet, big data, elections, street signs, lotteries, the Roman empire and a hapless Olympic shooting team, Matt Parker shows us the bizarre ways maths trips us up, and what this reveals about its essential place in our world.	<i>What's not to like - clever people getting it wrong! ...and the consequences that follow!</i>
2 <b>Factfulness by Hans Rosling</b>	<i>Alessandra Lochen, Research Postgraduate School of Public Health</i>	When asked simple questions about global trends - why the world's population is increasing; how many young women go to school; how many of us live in poverty - we systematically get the answers wrong. So wrong that a chimpanzee choosing answers at random will consistently outguess journalists, Nobel laureates and investment bankers. In Factfulness, Professor of International Health and a man who can make data sing, Hans Rosling, together with his two long-time collaborators Anna and Ola, offers a radical new explanation of why this happens, and reveals the ten instincts that distort our perspective. It turns out that the world, for all its imperfections, is in a much better state than we might think. But when we worry about everything all the time instead of embracing a worldview based on facts, we can lose our ability to focus on the things that threaten us most. Inspiring and revelatory, filled with lively anecdotes and moving stories, Factfulness is an urgent and essential book that will change the way you see the world.	<i>By the late statistician, which is a data-driven look into misconceptions around global health and economic inequality. Very light and easy read for those not familiar with the topics.</i>
3 <b>How to lie with statistics by Darrell Huff</b>	<i>Maria Portela, Undergraduate Bioengineering</i>	This book introduces the reader to the niceties of samples (random or stratified random), averages (mean, median or modal), errors (probable, standard or unintentional), graphs, indexes and other tools of democratic persuasion.	<i>This is a book that will make you question every single statistical figure you have ever encountered. It is not intended to be a course in statistics, and in fact, there are no equations on it. Instead, it uses many examples to show how easy it is to build misleading arguments and lists several devices by which data can be manipulated (willingly or not) to force a meaningless conclusion. When I studied statistics in high school, I found it hard to break away from mathematical descriptions and understand how to apply them to the real world. This book was really helpful to put those concepts into perspective, practice spotting statistical artefacts, and rethink the way I read scientific studies. It is written in a good-humoured, fast-paced style, quite easy to follow, and heavily illustrated. However, the book is from the 50s so do bear in mind some language and examples are terribly outdated. The main points are still valid, perhaps even more, today, in our data-driven world, than they were 70 years ago.</i>

## Outreach Book List - Maths

<p><b>4 Why does E=mc<sup>2</sup>? By Brian Cox and Jeff Forshaw</b></p>	<p><i>Scott Marley, Outreach Leader</i></p>	<p>What does E=mc<sup>2</sup> actually mean? Dr. Brian Cox and Professor Jeff Forshaw go on a journey to the frontier of twenty-first century science to unpack Einstein's famous equation. Explaining and simplifying notions of energy, mass, and light-while exploding commonly held misconceptions-they demonstrate how the structure of nature itself is contained within this equation. Along the way, we visit the site of one of the largest scientific experiments ever conducted: the now-famous Large Hadron Collider, a gigantic particle accelerator capable of re-creating conditions that existed fractions of a second after the Big Bang. A collaboration between one of the youngest professors in the United Kingdom and a distinguished popular physicist, Why Does E=mc<sup>2</sup>? is one of the most exciting and accessible explanations of the theory of relativity.</p>	<p><i>I have to admit to being a little biased on this one, as Brian Cox and Jeff Forshaw both taught me physics at Manchester a long time ago! This is a highly readable and accessible explanation of the theory of relativity with a minimal amount of mathematics. If you want something with a bit more mathematical oomph, then go for another book by the same authors, 'The Quantum Universe: Everything that can happen, will happen'.</i></p>
<p><b>5 Fermat's last theorem by Simon Singh</b></p>	<p><i>Scott Marley, Outreach Leader</i></p>	<p>In 1963 a schoolboy browsing in his local library stumbled across the world's greatest mathematical problem: Fermat's Last Theorem, a puzzle that every child can understand but which has baffled mathematicians for over 300 years. Aged just ten, Andrew Wiles dreamed that he would crack it. Wiles's lifelong obsession with a seemingly simple challenge set by a long-dead Frenchman is an emotional tale of sacrifice and extraordinary determination. In the end, he was forced to work in secrecy and isolation for seven years, harnessing all the power of modern mathematics to achieve his childhood dream. Many before him had tried and failed, including a 18-century philanderer who was killed in a duel, and an 18-century Frenchwoman who had to attend maths lectures at the Ecole Polytechnique disguised as a man. A remarkable story of human endeavour and intellectual brilliance over three centuries, 'Fermat's Last Theorem' will fascinate both specialist and general readers.</p>	<p><i>Can a book about mathematics be impossible to put down? This one is! Fermat's last theorem reads like the most gripping of detective novels with the detectives involved spanning 400 years from Fermat to Andrew Wiles. Along the way, we meet Euler, Cauchy, Turing, Hilbert, and many other greats of the mathematical world, and see how one man's obsessions finally cracked a seemingly unsolvable problem.</i></p>