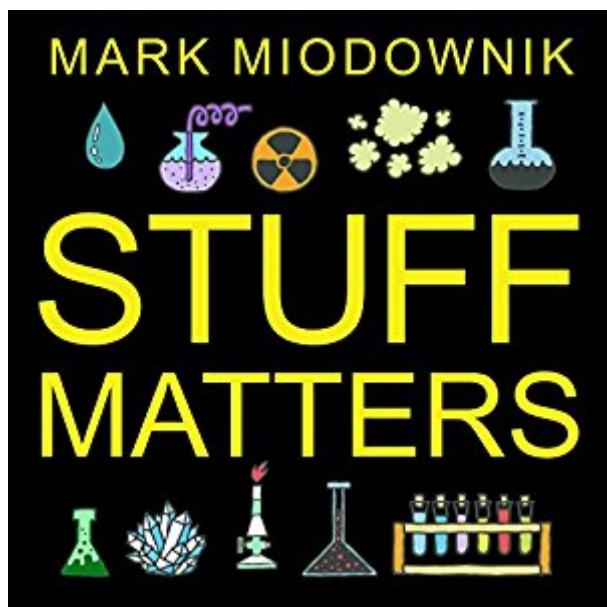


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# Stuff Matters: Exploring The Marvelous Materials That Shape Our Man-Made World



## **Synopsis**

Why is glass see-through? What makes elastic stretchy? Why does a paper clip bend? These are the sorts of questions that Mark Miodownik is constantly asking himself. A globally renowned materials scientist, Miodownik has spent his life exploring objects as ordinary as an envelope and as unexpected as concrete cloth, uncovering the fascinating secrets that hold together our physical world. From the teacup to the jet engine, the silicon chip to the paper clip, the plastic in our appliances to the elastic in our underpants, our lives are overflowing with materials. Full of enthralling tales of the miracles of engineering that permeate our lives, *Stuff Matters* will make you see stuff in a whole new way.

## **Book Information**

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## **Customer Reviews**

I purchased this book because it's my first year teaching 5th-grade science and I wanted to flesh out my curriculum with some interesting facts. What I encountered was so much more. Dr. Miodownik writes beautifully, explaining complex scientific processes in entertaining, humorous, and even deeply touching ways. I never conceived of the poetry behind the manufacture of steel, concrete, and glass. Plastic, which is so terribly maligned (justifiably, in many cases), nevertheless has an utterly fascinating and dramatic history. The chapter on chocolate is nothing short of a love letter to one of mankind's most sophisticated and delicious engineering achievements (make sure you have some on hand while you're reading—trust me). I can't wait to share my newfound knowledge and appreciation for chocolate with my students—complete with a tasting, of course. You'll also learn the story behind aerogel—something I hadn't heard of two weeks ago and which now sits

on my shelf, where it induces slack-jawed wonder in whoever happens upon it. What Dr. Miodownik has accomplished is very special. He's composed something that can't help but awaken his readers to the extraordinary world that surrounds us, one we so often take for granted.

Stuff Matters gives the reader a glimpse into the engineering and properties of many of the critical materials that we encounter in day to day life. Mark Miodownik is professors of material and society at UCL and introduces the reader gently to his expertise leaving them with a newfound appreciation for physics, engineering and chemistry. The book is highly readable and engaging and gives an excellent introduction to a subject we should all know about. Stuff Matters picks several materials that are all contained in the surroundings of the author while he drinks coffee on his roof. He starts by discussing steel and the properties of metal. He discusses how we moved from the bronze age to the iron age and what was required to jump to the steel age. The author discusses the atomic structure of metals and how simple metallurgy can fundamentally change the strength of metals due to the crystal structures. The author moves on to paper and where it comes from (plants) and how it is both made and its properties. He discusses different forms of paper including glossy, newspaper, receipt paper and money as well. The author then moves on to concrete and how it enables modern construction. Concrete has been with us from Roman times but was forgotten for millennia and was rediscovered only recently. The physics of the material are described and the properties of reinforced steel are detailed. The author moves on to a totally different kind of item, chocolate. He discusses the history and the properties and the reader is left with a newfound appreciation for chocolate making. The next subject tackled is foam. This topic takes the reader on a slightly less immediately observable material but is a fascinating tale. The reader is introduced to a material called aerogel which sounds remarkable. The author then moves in to plastic and discusses it through the story of the inventor of plastic, it is really interesting and plastic was first being focused on commercially to fill the supply demand imbalance for billiard balls. The author then discusses glass. We are shown how it is made and where it comes from. We are introduced to both modern and ancient glassmaking and the material properties of glass. The author also talks about carbon and discusses how graphite and diamond are the same material. He discusses the crystal and molecular structure of carbon atoms and how they can form together in different structures. The author discusses pottery and introduces the reader to both clay and basic pottery but extends the discussion to modern porcelain and ceramics. The author ends the topics with a story of how he broke his leg and some aspects of materials in modern medicine. He discusses plaster and how it is a simple yet incredibly important material that has changed the nature of life and death injuries for

math. He also discusses teeth and organs in reference to the 6 million dollar man to discuss what we can rebuild using todays technology. Stuff Matters introduces the reader to the basic properties of many of our most important materials used in day to day life. It does so engagingly and by the end the reader will feel like they understand a little bit more about the materials we use. Definitely recommend the book and the audience is very wide.

As I stood on a train bleeding from what would later be classified as a thirteen-centimeter stab wound, I wondered what to do. (The incident) was the birth of my obsession with materials starting with steel. from STUFF MATTERS As a schoolboy in 1985, STUFF MATTERS author Mark Miodownik was stabbed while in the London Tube by an assailant wielding a razor blade. Later, seeing a razor's edge glinting in the fluorescent lights of the local police station, Mark was launched into a life-defining raptness with the make-up of Stuff. He became a materials scientist. In the eleven chapters of this book in the popular science genre, the author delves into the nature of steel, paper, concrete, chocolate, aerogel, nitrocellulose plastic, glass, carbon, ceramic, and engineered body part replacements the lack of which would put Man back into the Stone Age. Mark shares his vast knowledge in an engaging and informal style. The book includes several of his hand-sketched drawings such as he might produce on a cocktail napkin over a pint with you in a pub near his South Bank home in London. Only once does he try too hard; when his discussion of nitrocellulose is presented as a film screenplay. Perhaps he shouldn't give up his day job just yet. For me, the best thing about popular science presentations, including STUFF MATTERS, is that I learn cool facts that will stay with me. For instance, I always thought concrete dried. But it actually traps all the internal water as it cures, i.e. when the calcium silicate fibrils in the cement crystallize. And the author's description of the classic way in which porcelain tea cups are produced was more fascinating than it seems it should be. It's all good stuff.

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