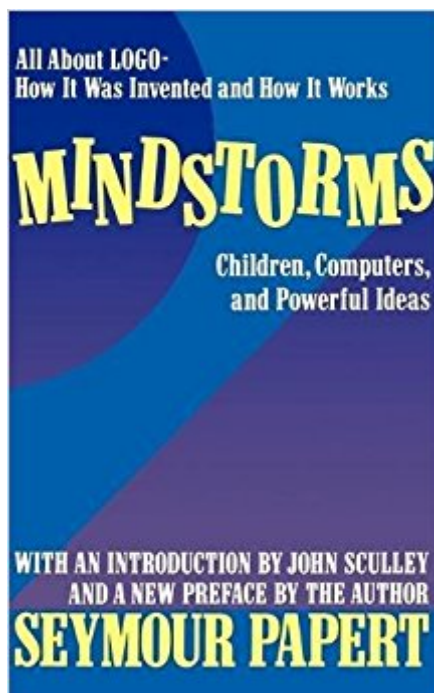


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# Mindstorms: Children, Computers, And Powerful Ideas



## Synopsis

Mindstorms has two central themes: that children can learn to use computers in a masterful way and that learning to use computers can change the way they learn everything else. Even outside the classroom, Papert had a vision that the computer could be used just as casually and as personally for a diversity of purposes throughout a person's entire life. Seymour Papert makes the point that in classrooms saturated with technology there is actually more socialization and that the technology often contributes to greater interaction among students and among students and instructors.

## Book Information

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## Customer Reviews

Seymour Papert is Lego Professor of Mathematics and Education at MIT, where he is also co-founder of the artificial intelligence and media laboratories.

I use this as the basis of a Minecraft + (i)Python class I teach, and as I tell everyone who asks, I'm really more or less working straight out of this book. It's the intellectual foundation - and stands in stark contrast to instructional material that just plows through teaching variables, loops, decision logic, procedures, and so on, i.e. the vast majority of programming literature. It was wonderful to see some of the kids "get" the math side of programming when we walked through the commonality between square and triangle functions - creating a general purpose polygon function, and then refactoring square and triangle to use it. There's so much they're being taught that they don't necessarily even realize, because it's all being delivered as something that's engaging and "fun".

This is the best book I have ever read on how to assist people to learn for themselves. Papert began his work by collaborating with Jean Piaget, and then applied those perspectives in a self-programming language designed to help children learn math and physics. Papert explains Piaget's work and provides case studies of how the programming language, LOGO, can help. He provides a wonderful contrasting explanation of the weaknesses of how math and physics are usually taught in schools. I learned quite a few things from this that I did not know before. People are very good at developing theories about why things work the way they do. I knew that these theories are almost always wrong. What I did not realize is that if you give the person a way to test their theory, the person will keep devising new theories until they hit on one that works. What is usually missing in education is the means to allow that testing to occur. An especially imaginative part of this book were the discussions of how to create theory testing solutions that are much simpler and easier to apply than any school problem you ever saw in these subjects. Papert works from a very fundamental and deep understanding of math and physics to reach the heart of the most useful thought processes for applying these subjects. It is thrilling to read about what you have known for many years, and to suddenly see it in a totally different and improved perspective. Another benefit I got from this book were plenty of ideas for how to help my teenage daughter with her math. She is very verbal, and Papert points out that math seldom teaches a vocabulary for talking about math. As a result, she memorizes a lot and gets dissociated from the subject. I got a lot of ideas for how to encourage her to personalize the concepts and problems by moving her own body. From that I realized that I often solve the same kinds of problems by recalling physical situations I have been in. But I have failed to help her make that connection because I was unaware of it on a conscious level. If you want to improve as a learner, help others learn better and faster, or simply want to understand more about different ways to think, this is a great book. I hope that all teachers get a chance to read and apply it. Enjoy learning more!

Papert was a pioneer in the field of instructional technology. Papert highlights two main constructs - one that children can learn to use technology in meaningful ways; and two, the ability to use technology as a part of the learning process effects the way future learning will take place. Papert took aspects from the Piagetian theoretical framework to support his learning philosophy. Specifically, Papert believed that children are the builders of their own intellectual structures. In other words, children use the tools around them to learn and build their intellect. Papert's theoretical framework differed slightly from Piaget's in that he highlighted the differences in the "tools" with

which children use by noting the importance of the culture surrounding those tools and the learning environment it provides. Instead of attributing slower development to complexity, as Piaget would have done, Papert believes that the culture from which the learner operates in should also be considered as a factor of development. Papert regarded teaching and learning in traditional classrooms of his time as inefficient, forced and sometimes even painful, and believed that instructional technology would transform classrooms as well as informal learning environments to more intuitive and nurturing environments. Papert certainly did not assert that instructional technology was a "magic wand" so to speak, but rather a tool that may enable a different path to success, or even an initial one! With a background in mathematics, Papert was well-aware of what he described as "mathaphobia," or the inclination of students to dislike math or believe they could not succeed in math. In an effort to combat learning obstacles like "mathaphobia," Papert created a scheme of optimal learning which would include the following components: tools for learning are integrated into the learner's "natural landscape." In other words, the learner should be able to experiment with the learning tools and relate to them in an intuitive manner. Additionally, the learning tools should be modeled by knowledgeable others, so the learner can relate to them in collaborative experiences. Papert also considered "body knowledge" to be an essential part of the learning process; learners should be able to use their kinetic intelligences on a regular basis during the learning process. The final component of optimal learning, according to Papert, is the ability to relate the new information to existing knowledge in a meaningful way. Papert used "computer-controlled cybernetic animals" or robots to explore the technology integrated learning process and optimal learning environments. Using robots and the LOGO computer language, Papert created learning tools and experiences for children and found great success when providing a free contact between the learners and their tools. Papert openly admits that he is a bit of a utopian thinker, and he writes as such, but his theories do resonate with instructional technologists, and educators overall. Educators, including myself, have seen that technology integrated learning environments can provide rich learning opportunities and Papert's Mindstorms is a great look at where technology integration started and also provides a multifaceted lens from which to critically examine where we are going in the future. I highly recommend!

This book is incredible. It ties together so much commonly known and well regarded foundational research with novel but tested ideas to break through what was formerly thought possible. The author worked with Piaget, but he was also deeply involved with computers at their very emergence. He not only correctly prophesies what was possible and likely to happen with computers in general

and in education, but he also correctly points out the danger that the true value of computers in education would be overlooked. Kids teaching computers is an opportunity for children to develop formal reasoning, iterative and algorithmic thinking, discipline, and the enjoyable side of making mistakes on the way of continuous improvement to reach a "correct" answer. Buy it. Read it. Live it. :-)

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