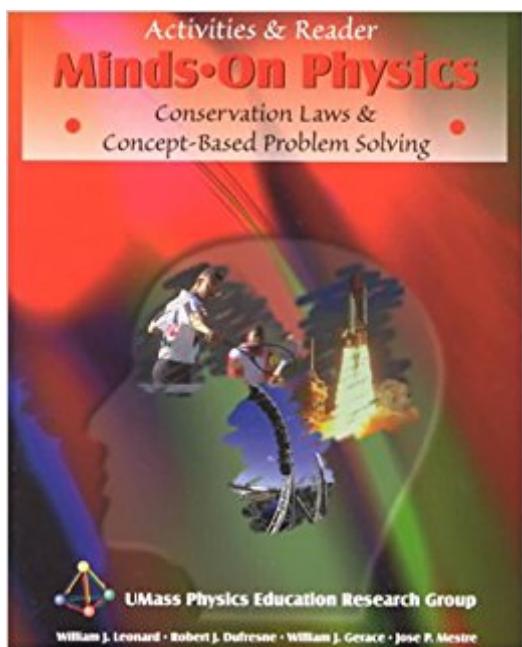


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# Minds On Physics: Conservation Laws And Concept - Based Problem Solving, Activities Reader



## **Synopsis**

Book by Leonard, William, Dufresne, Rob, Gerace, William

## **Book Information**

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## **Customer Reviews**

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As described.

At first glance this book looks like a workbook, but in reality it puts the reading in a separate section in the back. Students should first explore the ideas, and then read about them. It has been designed using good research into physics education, and has been field tested. An independent evaluator has found that students who learn physics using this series of texts exhibit "expert like" ability to solve problems. Most educators, politicians, and the general public are not aware that there is a branch of physics called Physics Education Research (PER). This research done by physicists has been able to push up student understanding and problem solving ability. This text series is based on the that research, unlike most texts. The standard texts often include research based ideas as decorations, when they even bother to include them. If this text is combined with a research based teaching method such as Modeling (modeling.asu.edu), research shows that students get high gain in understanding. Most HS classes only achieve 10% normalized gain, but with research based teaching gain ranges from 30% to 70% or higher. The main problem with the text is that students who are used to conventional teaching, think they don't have a textbook. HS students want to be

told everything, and are not used to the idea that the only way to learn something well is to do their own thinking. This book promotes thinking so students on surveys will respond "We had to learn things by ourselves". This response shows they got the idea. The other problem is that teachers must change their way of teaching in the direction that is currently recommended. But once they do this, the increased student learning is very gratifying. But if they are unwilling to change, they will find this text to be uncongenial, and they will be better using a traditional text. A big advantage of this text is that it breaks down the topics into separate slim volumes which are easy to carry and if three hole drilled will fit into a standard 3 ring notebook. So students can carry their work, and the text all in one relatively thin notebook. There is a companion teacher's guide which is very complete unlike most texts. The usual text just has a teacher's edition with side bars, while the companion details what the students might think, and how the lessons might be implemented. The teacher's guide while good for the instructors, will probably be fairly impenetrable by students. So it will not help students who buy it. This series also can be bought by a district without fear of obsolescence. There will probably be no new editions, so just replacements for dog eared texts need to be purchased later. The students put answers on duplicatable answer sheets and are not supposed to write in the books. The master answer sheets are in the teacher's guides. So this series of books can save money compared to a comparable traditional text. Since each volume is used for a limited time, they tend to wear well. The main improvement that could be made by the publisher is to supply it already with holes for putting it into a standard binder. There are 6 volumes in this series, but the first three are the most important. A typical course may only use sections from the last three volumes. This review applies to all volumes in this series.

I used this book for my physics class, and I thought it contained good problems for practice. It was very understandable, but I would not use it as a study guide. It definitely lacks the explanation a first time physics student would need, especially since physics IS very confusing. Use this book with other, more explanatory books.

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