

## Understanding Physics Part 1



### Subject area

General Physics.

### Description

An introductory undergraduate text in classical mechanics which introduces the reader to both vector cross products and simple calculus.

### Authors

Karen Cummings, Priscilla W. Laws, Edward F. Redish and Patrick J. Cooney.

### Publishers/Suppliers

John Wiley & Sons, Inc. John Wiley and Sons, Ltd. ([www.wiley.co.uk](http://www.wiley.co.uk)).

### Date/Edition

2002/Preliminary Edition.

### ISBN

0-471-20044-1.

### Level

A-level, access, undergraduate.

### Price

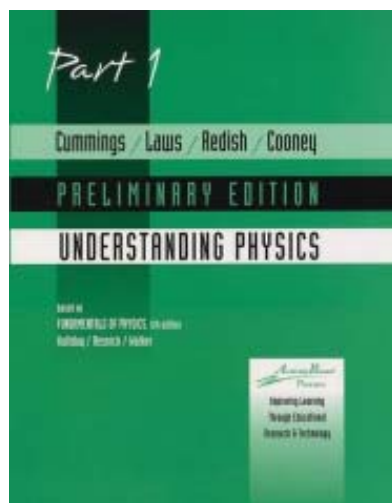
£13.16 ([www.Amazon.co.uk](http://www.Amazon.co.uk)).

Gren Ireson  
Matthew Arnold Building  
Loughborough University  
Loughborough  
Leicestershire  
LE11 3TU  
April 2002

This text sets out to cover the mechanics found in an introductory physics programme at a US college. The authors start by stating that this text is based on the sixth edition of 'Halliday and Resnick' which makes it a very difficult act to follow and given the changes made in the sixth edition I was left wondering why the publisher should want a competing text.

However reading through the twelve chapters of the text one soon becomes aware of the major differences:

1. The excellence of the narrative style, which is not interrupted by illustrative problems, these come at the end of the chapter under the title of 'Touchstone Examples' with more standard exercises being given at the end of the book.
2. The use of research into physics education, particularly in the area of student misconception and the use of 'reading exercises' to focus the attention of the student on key areas of each section. This, I feel, genuinely enhances the narrative and will certainly be a boost to the average or weaker student.



3. The linking of the narrative to experiment procedures that all students will meet (or have met) in their study of physics. This, in my view, is made all the stronger by the manner in which the authors have integrated the use of data-logging tools for gathering, analysing and presenting data.

Overall I found this a refreshing addition to the vast number of texts dealing with mechanics at the pre-university and introductory undergraduate level. Calculus is not avoided but introduced in a non-threatening way on a 'as needed' basis. SI units are used and very clear, and consistent, vector notation is adopted. The student is taken, in very gentle steps, from basic measurement and SI units to complicated rotations involving cross products. This approach tends to make the mechanics exciting by providing insights into everyday life or as the authors write. "Yet to find surprises in physics you don't need to wait till you study relativity or quantum mechanics."

The problems, both touchstone examples and those at the end of the book, offer something for everyone with the solutions to the former being particularly clear with 'key ideas' being highlighted.

My only complaint is with the size and quality of some of the diagrams and photographs. Even given the use of grey scale for both I feel the quality could, and given the quality of the narrative should, be improved. The size of the diagrams is obviously a matter of space but in places I did rely on knowing what should be in the diagram rather than being able to clearly read it!

In conclusion, notwithstanding the quality of the diagrams, I would certainly advise anyone looking for a fresh approach to the teaching of mechanics with the use of some basic calculus to give this book a try.

### Summary Review

range: \* very poor to \*\*\*\*\* excellent

Academic content	*****
Usefulness to student	*****
Usefulness to teacher	*****
Meets objectives	*****
Accuracy	*****