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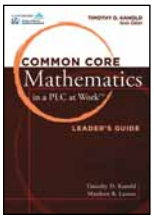
Common Core Mathematics in a PLC at Work™: Leader's Guide, Timothy D. Kanold and Matthew R. Larson, 2012. Grades Pre-K–12, 155 pp., $24.95 paper. ISBN 978-1-936765-47-8. Stock no. 14387. National Council of Teachers of Mathematics and Solution Tree Press; www.nctm.org.



Professional Learning Communities (PLCs) focused on the understanding and implementation of the Common Core State Standards for Mathematics (CCSSM) is, the authors argue, one viable response to the literature that demonstrates the challenges created when teachers work in isolation. Kanold and Larson further argue that PLCs are needed to bring about sustainable change in schools in lieu of what they call "one-shot" professional development. To support the work of PLCs and their leaders, this book provides a wealth of resources to address critical areas of need as well as paint a picture of the promise of a PCL when all entities are truly collaborating.

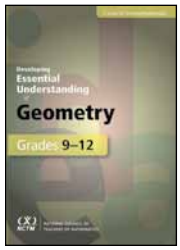
The book's strength is its practical examples. Incremental actions in the form of steps, stages, or tiers are suggested to help collaborative groups begin and sustain their work while focused on student learning, development, and assessment. The examples provided allow leaders and teachers to "see" what each step, stage, or tier might look like. Tools and rubrics are embedded throughout the text and help illuminate major ideas in each chapter.

The questions at the end of chapters along with the variety of included tools make this book a helpful resource for schools interested in developing PCLs, whether their focus is on the Common Core or other important issues. In addition, the tools and rubrics are available online and can be modified by individual groups or leaders to fit their specific needs.

—Stacy Reeder
University of Oklahoma
Norman, OK

Prices of software, books, and materials are subject to change. Consult the suppliers for the current prices. The comments reflect the reviewers' opinions and do not imply endorsement by the National Council of Teachers of Mathematics.

Developing Essential Understanding of Geometry for Teaching Mathematics in Grades 9–12, Nathalie Sinclair, David Pimm, and Melanie Skelin; Rose Mary Zbiek, series ed., 2012. 109 pp., $35.95 paper. ISBN 978-0-87353-692-9. Stock no. 14123. National Council of Teachers of Mathematics; www.nctm.org.



This recent addition to NCTM's Essential Understanding series highlights four key ideas that geometry teachers need to consider in the teaching of geometry: diagrams, variance and invariance, definitions, and proof. The understanding and assessment of these ideas, along with the vertical and horizontal alignment of geometry topics, is the book's focus.

One key area that the authors emphasize is the importance of variance—that is, change—in the study of geometry. One highlighted example is the intersection of a circle with a line. Specifically, if a chord is rotated at a point of intersection with the circle so that it becomes a tangent, then that line is also perpendicular to a radius at that point. Further, this explanation verifies the root meaning of the word *right*, which relates to balance (p. 12). In other words, the tangent is balancing on the point of tangency; if not, it would be intersecting the circle at two points. Word origins and roots are used throughout the book to help clarify and illuminate many geometric terms.

While reviewing this book, I had many "aha!" moments when the authors made connections between geometry and other areas of mathematics. For example, when decomposing a triangle into a rectangle to develop the area formula, students need to know the algebra concepts of slope and midpoint of the sides of a triangle (p. 54).

Reading this book will expand and strengthen any experienced geometry teacher's knowledge. Note: Thinking is required!

—Lynn Mitzel
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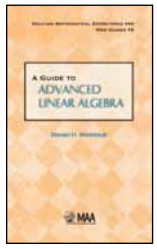
FROM OTHER PUBLISHERS

A Guide to Advanced Linear Algebra, Stephen H. Weintraub, 2011. 255 pp., $39.95 cloth. ISBN 978-0-88385-351-1. The Mathematical Association of America; www.maa.org.



A Guide to Advanced Linear Algebra is the newest addition to the Dolciani Mathematics Exposition Series (no. 44) and the MAA guides (no. 6). Its approach to linear algebra is strictly theoretical; no computational issues are addressed. The book assumes that readers know most of the basics in linear algebra; thus, it is certainly not suited for beginning students.

In addition, this book is not suitable for students with a rich knowledge of algebra, who would already be familiar

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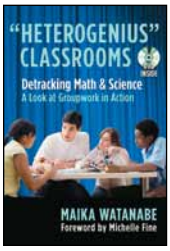
with the material presented here. Those who would benefit from such a book are upper-division undergraduate students or beginning graduate students who lack formal depth in proof of theorems of linear algebra as well as teachers who need a refresher in these topics.

The book is well organized. It approaches linear algebra from a purely algebraic perspective—namely, the concepts of vector spaces and linear transformations. Definitions, remarks, lemmas, examples, theorems, and proofs are labeled simply and, most of the time, clearly. The author's intent is evident in his organization of the text. He starts with basic definitions and theorems of vector spaces and linear transformations and then moves to matrices of linear transformations; determinants, eigenvalues, and eigenvectors; and then inner product spaces. The beginning synopsis of each chapter gives a view of the author's intent for that chapter and allows readers to focus on the content.

This book provides readers with valuable knowledge. It would be most useful as a reference book for teachers who wish to revisit the major ideas and proofs of the topics of linear algebra.

—Cynthia Barb
Kent State University at Stark
North Canton, OH

"Heterogenius" Classrooms: Detracking Math and Science—A Look at Groupwork in Action, Maika Watanabe, 2012. Foreword by Michelle Fine. 98 pp. + DVD, $36.95 cloth. ISBN 978-0-8077-5246-3. Teachers College Press; www.teacherscollegepress.com.



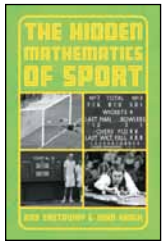
In *"Heterogenius" Classrooms*, Watanabe presents a framework for instruction in a detracked, heterogeneous classroom. She defines *detracking* as "universally accelerating all students." Through her research at three urban charter schools, she found that all students make academic achievement gains in a detracked program. The book and DVD explain the benefits of detracking and how to instruct effectively through group work. The book provides four lesson plans, rubrics, handouts, and reflections that model group work. Watanabe also addresses the necessary additional supports for students and teachers for all to be successful through this framework.

"Heterogenius" Classrooms is intended for use by all educators, from teacher education programs to school- and district-level administrators to classroom teachers. The book and DVD can be used to spark discussion and inspire ideas about how to implement effective group work. Although the setting for this framework is urban charter schools, the framework can be applied to schools of all sizes and demographics. The book and DVD highlight the six characteristics of group-worthy tasks and provide four examples of such tasks. I wish the DVD had included a lengthier clip of a group-worthy task in action and had featured the teacher's role in facilitating the learning through the task.

Although detracking may not be a reality for all schools, Watanabe's ideas are worth considering as educators strive to provide effective instruction for all students.

—Fenecia Foster
Sawyer Public School
Sawyer, ND

The Hidden Mathematics of Sport, Rob Eastaway and John Haigh, 2011. 199 pp., $15.52 (U.S) cloth. ISBN 9781907554223. Anova BookStore; www.anovabooks.com.



This book is fun! The fact that most of the sports mentioned here are uncommon ones for a U.S. audience—not ignored, just underappreciated—puts the reader in a novel framework yet with an old friend: mathematics.

The fact that sport and mathematics are intertwined is not news to anyone, particularly to any baseball, basketball, or hockey fan, but this relationship exists in many other sports as well. Certainly, we are all aware of tennis and soccer (make that "football"!), but don't forget about rugby, cricket, snooker, darts, horse racing, high jumping, triathlons, and all the Olympic sports, just to name a few. If this list sounds Anglocentric, you've divined the book's origin.

Don't take up this book expecting to be "schooled" in sports-generated mathematical nuances or (for the most part) references to advanced mathematics. But the mathematics here is approachable and intelligible at the secondary school level—counting arguments, game theory, some very simple physics, tournament design, and elementary statistics. Even the efficacy of cheating is addressed. And the authors have added a few teaser problems to each chapter to make you think about both the sport itself and the mathematics lurking behind it. They also provide ample additional references to pursue suggested topics more fully.

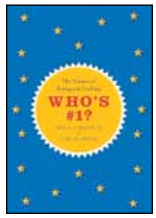
I won't spoil your read, but here are a few intriguing questions discussed in the book:

- In shot put, are you better off adding 1 percent to the height of the release or 1 percent to the speed?
- Who or what were Running Rein and Flocton Grey?
- What's a googly?
- How does Pythagoras's theorem apply to the triathlon?
- Statistically, what is the best tactic for running an 800 meter race?
- What's unusual about the football road signs in Britain?

You may collect some ideas for classroom projects, you will certainly enjoy the writing, and you will come away pleased, a little challenged, and not drained or pushed over the edge mathematically. Definitely worth reading!

—J. Kevin Colligan
RABA Center, SRA International
Columbia, MD

Who's #1? The Science of Rating and Ranking, Amy N. Langville and Carl D. Meyer, 2012. 266 pp., $29.95 cloth. ISBN 978-0-691-15422-0. Princeton University Press; www.press.princeton.edu.



The authors' stated purpose is to provide a single resource that describes several techniques and uses of both ratings and rankings, including some new

strategies that they have devised themselves. The audience they identify is vast, from mathematicians to sports enthusiasts to gamblers. Although they suggest that some fundamental knowledge of linear algebra and optimization is helpful, they encourage those without this knowledge to read the book anyway. However, some examples are not helpful for those without the mathematical grounding; at other times, the mathematics is overwhelmed by the number of data points in the example.

The book contains some fascinating applications, such as the 2000 U.S. presidential election, but focuses more on sports examples, some of which become tedious. The authors also provide a reference list that offers numerous avenues for pursuing details and nuances.

In several instances, the authors begin with a theory and then illustrate the theory with an application; in others, they build to the theory from an application. This inconsistency, which makes some chapters appealing to the nonmathematical reader and other chapters appealing to the mathematical reader, can make the text difficult to follow at times.

Overall, the book does achieve the authors' stated purpose. Readers will find many interesting ideas as they grapple with the complexities of the science of rating and ranking.

—Bob Horton
Clemson University
Clemson, SC

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New from NCTM: The Essential Guide to Navigating Your First Years of Teaching Secondary Mathematics

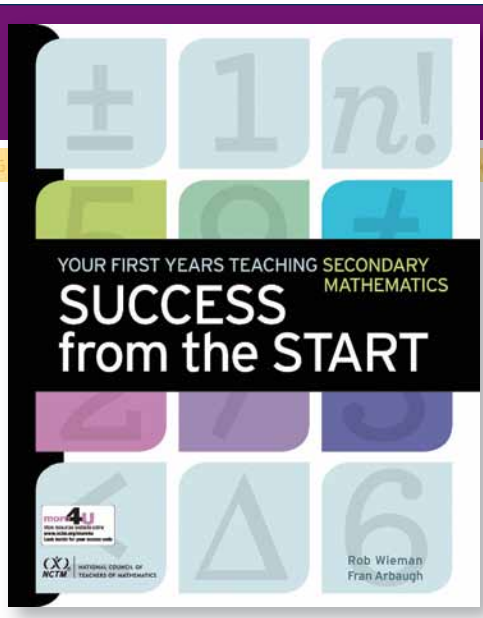
THE FUTURE. INSPIRING TEACHERS. ENGAGING STUDENTS. BUILDING THE FUTURE. INSPIRING

Success from the Start: Your First Years Teaching Secondary Mathematics

BY ROB WIEMAN AND FRAN ARBAUGH

You just signed your first contract to teach secondary math. You're excited but you have many questions and concerns:

- What do I do when students don't "get" the lesson?
- What about students who struggle with math they supposedly learned in elementary school?
- How do absent students make up the work?
- Do I assign seating or let students sit wherever they want?
- Should I let students work in groups?
- How much homework should I assign and grade?



Based on classroom observations and interviews with seasoned and beginning teachers, ***Success from the Start: Your First Years Teaching Secondary Mathematics*** offers valuable suggestions to improve your teaching and your students' opportunities to learn. The authors explore both the visible and invisible aspects of teaching and offer proven strategies to make the work meaningful—not merely manageable. Success from the start means being prepared from the start. This book not only teaches you how to be an effective math teacher but also gives you the tools to do it well.

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