

- What is the mathematics being learned?
- How is the mathematics developed?
- What is the nature of the work of students?
- What is the role of the teacher?
- What will students likely take away from the lesson?



What are the differences between
these textbook lessons?



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Textbooks available today reflect huge differences in philosophies about how students learn mathematics.



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Textbooks should...

- Include many rich problems for students to tackle.
- Contain investigations that engage students in thinking about important mathematical ideas.
- Expect students to share and discuss their ideas about mathematics.
- Value and encourage use of multiple strategies and representations.
- Interweave and connect “big ideas” of mathematics across the grades (but not needlessly repeat topics).



What matters most - evaluating textbooks

- Is the mathematics content and sequence right?
- Are the suggested instructional activities of high quality - do they engage students?
- What support is provided for helping teachers enact good instruction?



Mathematics Content Emphasis

- The math content is aligned with sound curriculum goals.
- The mathematics emphasizes an appropriate balance of skill development, conceptual understanding, and mathematical processes.
- Mathematical ideas are connected and interwoven across strands rather than studied in isolation.
- Mathematical topics are presented in appropriate depth and built on in subsequent grades to develop mathematical sophistication of the topic over time.
- Contextual problems appropriate for and engaging to students are utilized, where appropriate, to give rise to the mathematical ideas.
- Materials maintain high expectations for all students.



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Engaging Instructional Activities

- Activities foster the development of a mathematical disposition (mathematics as a way of thinking).
- Lessons promote classroom dialogue and communication about student thinking.
- Lessons utilize worthwhile mathematical tasks and problems that can be modified to engage, motivate, and challenge students at varying levels to think mathematically.
- Where appropriate, lessons involve use of instructional technology, manipulatives, and other tools to visualize complex concepts, acquire and analyze information, and communicate solutions.
- Activities promote student engagement in inquiry-based learning, reflection, critical thinking, problem solving, sense-making.



Teacher Support

- Materials provide tools for assessing student learning to gauge, guide and enhance student learning.
- Materials provide opportunities for teachers to increase their own understanding of the mathematical ideas students are studying.
- Materials suggest ways to adapt instructional activities for special needs students.
- Materials provide information regarding what students might already know about the mathematical ideas in the unit, including common misconceptions.
- Materials provide a rich source of problems, exercises, and projects that can be used for homework.
- Materials provide useful diagrams, charts, data sets, models to help students conceptualize mathematical ideas.



A Variety of Textbooks Exist

- You may need to ask publisher representatives for a full list of their products (NSF-funded and Publisher-developed).
- As district leaders, you will certainly need to do your homework (what exists, what is aligned with our standards, can we support teachers to use new models of textbooks?)



Can textbooks serve as a catalyst for change for an entire school or district?

If so, under what conditions?



Critical Elements

Leadership

- district and school level
- commitment of resources

Teacher buy-in

- recognize a need to change
- willingness to change
- learn new ways of teaching

Shared goals for students

- active learning
- understanding and skills

Professional development

- initial implementation
- ongoing support
- opportunities for networking



My advice

- Resist the temptation to choose a textbook that will be “easier” to teach.
- Resist the temptation to purchase the textbook that comes with the most “stuff.”
- Look beyond alignment to state standards.
- Review the “engagement” level of textbook activities.
- Resist the temptation to think about a curriculum as a collection of activities or favorite lessons.
- It’s not just about adopting a new textbook -- ongoing professional development based on the textbook is critical.





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An NSF Center for Learning and Teaching

Mathematics curriculum:

what is important, what is expected,

how it is organized and sequenced,

how it is taught, and what students learn

is the core around which mathematics education revolves.

ANNOUNCEMENTS

**Upcoming Conference -
Future Curriculum Trends
in School Algebra and
Geometry - May 2008** [\[link\]](#)

**Conference Archive -
Doctoral Programs in
Mathematics Education -
Sept. 2007** [\[link\]](#)

**New report - State-level
high school mathematics
standards and graduation
requirements** [\[link\]](#)

**New book - Perspectives
on the Design and
Development of School
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edited by Chris Hirsch,
published by NCTM** [\[link\]](#)



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