

**Selecting and Implementing Standards-Based Mathematics Curricula**

*The following article is an adapted excerpt from the September 1998 issue of Curriculum Connections, a newsletter published by the K-12 Mathematics Curriculum Center (K-12 MCC). The NSF-funded K-12 MCC assists school districts as they select and implement standards-based comprehensive mathematics curricula. The center offers a series of seminars, resource guides, cases, referrals, and phone consultations to facilitate discussion and decision-making within a district. These efforts are geared toward key aspects of selecting and effectively using mathematics curricula consistent with the NCTM Standards. The center supports 13 curricula including two published by Everyday Learning Corporation: Everyday Mathematics for elementary students from the University of Chicago School Mathematics Project and the secondary curriculum, Contemporary Mathematics in Context (CMIC) from the Core-Plus Mathematics Project.*

Through interviews with teachers and administrators, the K-12 MCC has gathered some useful pointers about the process of selecting and implementing standards-based mathematics programs.

**Think long-term.**

Successful selection and implementation of new standards-based curricula requires a thoughtful process. These programs are vastly different from their predecessors in varying degrees. They introduce significant changes in teaching (and learning) practices: students learn mathematical reasoning, ways of communicating about mathematics, and ways of making connections between mathematical ideas; students interact with a range of materials representing problem situations (manipulatives, calculators, computers, diagrams, etc.); and students work collaboratively as well as individually.

The materials that make up these comprehensive programs look different. Many of the new texts include content that has not been part of conventional mathematics programs (for example, data analysis) and are organized much differently than traditional texts. Ideas are learned in different sequences than in traditional programs. Mathematical concepts are embedded in applications; the more teachers become acquainted with the materials, the better they comprehend the depth of the mathematics

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within lessons. A thoughtful and involved review of the materials you're considering will help your committee make an informed decision.

The differences in the new materials imply a significant change for teachers in their approach to teaching mathematics. Understanding the philosophy behind the development of the programs has helped teachers fully appreciate the need for new pedagogical practices. Consequently, before selecting or using new programs, teachers need more time not only to learn the materials, but also to adapt their classroom strategies. In addition, building community understanding of the theory and approach of new programs requires a longer timeline. Parents and other community members want assurance that a new mathematics program will improve student learning and can be taught effectively; your selection committee should incorporate time to involve these stakeholders in the process.

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Thinking long-term applies to implementation as well as selection. Through our discussions with practitioners, we've learned of a variety of implementation models practiced by districts. The important consideration is for your district to create a plan that will best serve the needs of your students, teachers, and community.

### **Plan for professional development.**

As we've talked with teachers, administrators, curriculum developers, and publishers involved with standards-based curriculum programs, all have stressed the need for ongoing professional development to make these programs effective for students. Teachers need opportunities to be learners of both new mathematical content and new pedagogical practices. Teachers

need time to develop the necessary understanding of the very different ways these new materials represent and teach mathematical concepts. One lead teacher stated, "The school has to make a commitment to give teachers some kind of release time so the teachers can deal with bringing this new stuff into their lives, because it is a big change in their lives." Teacher training is recommended, both prior to and during the process of teaching the new programs. Some successful strategies have included workshops taught by experienced teachers of the curriculum, the assistance of demonstration teachers or classroom coaches during the early phases of implementation, common planning time for teachers of the new curriculum, and peer support for troubleshooting.

Many districts that have had success adopting standards-based materials had ongoing professional development in place, which helped their teachers to be better prepared to teach the new curricula. Districts engaged in long-term planning for a new program might want to think about how their current professional development program could help support a curriculum adoption down the road.

### **Reach out to stakeholders.**

Students and teachers are not the only groups of people who will recognize that these materials are different; parents, other community members, and administrators alike will find that "mathematics" doesn't look the same as it did when they were in school. As one mathematics supervisor said, "It is very frightening to parents when you tinker with the mathematics program." Keeping parents informed of the changes in their children's mathematics education helps parents feel more comfortable. Some schools host parents' nights, during which parents are invited to "math class" where they experience lessons from the new curriculum. Other schools send home regular letters to parents explaining the philosophy and method behind the mathematics their children are practicing. A K-12 mathematics coordinator from a large rural district told us about a parent handbook the district team

created for each unit: “It’s been our most successful strategy, the best thing for dealing with the questions. It really lays out what the program is trying to do, and helps people see where the math is in some problems.”

A strategic implementation involves various groups of stakeholders in both selecting and implementing the new program. One curriculum consultant for a rural state systemic initiative explains, “Our committee used the community members all the way through the process of identifying what they wanted the content to be .... They talked together about what was important to look for in a curriculum and what they wanted students to know.” By actively seeking the input and support of members of the community, districts and schools not only promote greater community involvement in education, but also expand the wide range of community resources and support available to their students.

### **Maintain strong leadership.**

Introducing standards-based mathematics into a community can be a challenging process that requires a leader or leaders who can maintain the vision for improved mathematics education within the district. The leadership role includes orchestrating materials selection and implementation that is consistent with the district’s vision, as well as being a public representative of that vision. One lead teacher told us, “Leadership is the key .... It is important to have someone who will say to the district as a whole, to teachers and administrators and parents, ‘This is the philosophy. This is the curriculum we are going to use, and this is how we will implement the curriculum.’”

Many mathematics supervisors, department chairs, and lead teachers have played this lead role in a variety of ways. They facilitate a selection process that gives people adequate time to learn about the materials, has clear selection criteria, and involves appropriate stakeholders. They establish a strategic plan for introducing the new materials to the schools. They arrange for adequate professional development. It is evident that they create lines of communication and discussion among teachers, parents, and administrators.

### **Seek support.**

While the change to standards-based curricula may seem daunting, it is necessary for schools and districts to recognize the challenge and seek appropriate support. Several mechanisms exist to nurture your district’s process. Some of these resources reside within the district: the lead teachers interested in innovative materials and methods, the funds districts normally have for mathematics and science, such as Eisenhower funds, that could be directed toward supporting curriculum implementation, and local universities that may already provide professional development. National resources also exist. The National Science Foundation has funded elementary, middle, and high school level imple-

mentation centers, as well as the K–12 MCC, to help provide schools and districts with information and resources about standards-based curricula. Additionally, each of the curriculum programs has a corresponding “satellite” implementation center to help schools learn specifically about that program. Resources like the National Science Foundation’s Local Systemic Change grants provide funding for teacher enhancement.

### **Think about cross-grade transitions.**

In standards-based curricula some concepts are learned in different sequences than they have been with traditional materials. When students transition into a standards-based program, there are multiple structural changes in their mathematics classroom and style of learning. Therefore, districts thinking about using a standards-based program should give some consideration to their mathematics curriculum from a K–12 perspective. Whether your district seeks to implement new curricula at all grade levels or at only one grade level, it may be impossible to find programs that “perfectly match” those at other grade levels. As you plan your K–12 curriculum, examining the articulation between grade levels will help your district find the areas of overlap or the gaps, and will help you anticipate where students may need extra support with new pedagogy. Good communication across grade levels is helpful in this process, as is information from publishers, developers, and users of the programs.

### **For more information**

The themes presented above constitute some guidelines for your curriculum selection process. To provide more in-depth guidance in thinking about selection and implementation strategies, the K–12 MCC will soon offer *Choosing a Standards-Based Mathematics Curriculum*. This guide provides an in-depth look at the selection and implementation process, addressing topics such as committee selection, development of selection criteria, designing professional development, and implementation. For more information about these and other materials, please contact Ki McClennan, K–12 Mathematics Curriculum Center, Education Development Center, 55 Chapel Street, Newton, MA 02458-1060; phone 1-800-332-2429; E-mail: [mcc@edc.org](mailto:mcc@edc.org).

Everyday Learning publishes *Connected Geometry*, written by authors at Education Development Center, Inc.