

**California Math Policy Work Group
Recommended Changes to Policy and Implementation
March 2010**

California has long been a leader in standards-based education in mathematics. The state has made steady progress in building a comprehensive policy system organized around a set of rigorous content standards for students at all levels of the public education system. However, despite this progress, the state lags on national and international assessments of math achievement. State leaders share a sense of urgency to improve this situation.

In this context, the California County Superintendents Educational Services Association (CCSESA) convened a work group to develop recommendations to improve the state's math policy system. The objective given to the work group was as follows:

Within the context of a severely challenged state resource environment, develop a state policy framework for a coordinated mathematics policy for student proficiency in Algebra that considers 1) current grade level expectations and assessments used to measure grade level standards, and 2) state and federal accountability requirements.

The policy framework would include:

- *Articulation of needed changes in state and local policies to meet or modify federal accountability/assessment requirements*
- *A multi-step action plan to meet the requirements (e.g., professional development/teacher preparation activities for teachers, extended opportunities for student learning, modifications to grade level assessments)*
- *Potential identification of federal or philanthropic resources needed to implement the plan (e.g., explore federal stimulus funds under Race to the Top and/or Innovations/What Works grants)*

The work group consisted of twenty state and local education leaders (see Appendix A for a list of members) and met four times over the fall of 2009 to develop the recommendations described below.

Organization of this document

We, the members of the work group, interpret our charge as an opportunity to ***recommend improvements to California's policy system for mathematics education so that it better promotes success in Algebra I as a minimum expectation for all students before they graduate from high school.*** We recommend a focus on Algebra I as a minimum expectation for students since it is the gateway to higher learning in mathematics, as well as student success in college and career.

By "policy system," we mean both the policies themselves (i.e., statutes, regulations, rules) and the implementation actions needed to make the policies successful (e.g., structures, systems, resources). We offer suggestions for improvement in both policy and implementation.

We also concluded early in our discussions that improving the math policy system requires changes to all components of the policy system. We categorize these components as: standards, instructional materials, teacher preparation, professional development for

teachers and leaders, student assessment, accountability, and student support. This document is organized by these components, offering recommendations for state action within each.

We believe that improving the system requires coordinated action by several state entities – the Governor, the Legislature, the State Board of Education, the Superintendent of Public Instruction (SPI), the California Department of Education, the California Commission on Teacher Credentialing, institutions of higher education (IHEs) – and by local education agencies. To the extent possible, we identify the entities that need to take action in response to these recommendations. At the same time, several members of the work group are parties to active litigation related to California math policy. In order not to jeopardize the legal positions of any party to that suit, we often refer to “the Administration, the SPI and the Legislature” as the entities needing to take action. The Administration in this context is inclusive of the Governor, the Secretary of Education, and the State Board of Education (SBE). The SPI is the Superintendent of Public Instruction.

The document represents the consensus of the group. Where we could not reach consensus on important issues, we offer some additional considerations.

Recommendations

Standards

California has rigorous and comprehensive mathematics standards in grades K-12 and a robust mathematics curriculum framework that promotes the preparation of students to succeed in algebra. These are important assets. At the same time, practice in California schools suggests some areas in the math standards that should be addressed. Notably, the breadth of the standards often encourages educators to cover a large amount of content without going deeply on key concepts that best predict success in algebra. Also, the standards need greater articulation from grade to grade.

Finally, we recognize that there is a major national effort underway to create a common core of standards in mathematics, sponsored by the National Governors Association and the Council of Chief State School Officers. Because the common core standards project is closely tied to the federal Race to the Top initiative, and because there is speculation that the common core standards may be included in the upcoming reauthorization of the federal Elementary and Secondary Education Act (ESEA), we believe that the state should continue to monitor the development of the common core.

Meanwhile, the Administration, the SPI and the Legislature should **establish a deliberative and inclusive process to address how the state would undertake a refinement to the state mathematics standards and incorporate standards developed by national consortia, as applicable**. Such a process should aim to maintain the rigor of California’s math standards while promoting greater depth in instruction and better articulation of content across grades.

In addition, the Administration, the SPI and the Legislature should **create a predictable and sensible timeline for periodic refinements to standards, frameworks, and materials adoptions**. These two structural changes would increase transparency and predictability in the state’s policy system and serve as important anchors for any other changes.

Instructional Materials

California has adopted standards-aligned core mathematics materials, algebra readiness instructional materials, and intervention materials. We believe that effective use of these materials is central to promoting proficiency in algebra for all students. There is some emerging evidence that schools across the state are using a wide array of adopted materials and that a large percentage of teachers are using the materials.¹

Building on these promising signs, we recommend that the Administration, the SPI and the Legislature **modify the adoption process to (1) emphasize the availability of a variety of technology-based materials (e.g., take advantage of Open Education Resources) and (2) alleviate pressure on elementary teachers to implement new materials adoptions in multiple core academic subjects in rapid succession.** Since there is currently a five-year moratorium on updates of curriculum frameworks and adoption of instructional materials, this can be a deliberative process and would require statutory action.

Further, to ensure more universal student access to state-adopted materials, we encourage CDE and other state partners to **increase communication to school districts about the availability of algebra readiness and intervention materials.**

Teacher Preparation

We make two observations about the teaching force in California. First, multiple subject teachers need stronger preparation and support to effectively teach standards-based mathematics. Second, single subject teachers – especially those teaching algebra – need stronger preparation and support to work effectively with struggling students. We view these two challenges as central to any effort to improve math achievement for students. Addressing them will mean making policy changes related to teacher preparation (discussed here) and professional development (discussed below).²

We believe that the SBE and CTC need to have more built-in dialogue with one another to support coherent policy-making. Specifically, the SBE and CTC should **create a clear and aligned process for revising the Mathematics Framework for K-12 instruction and revising requirements for math teacher preparation programs.** Revisions to the Framework and requirements for preparation programs should focus on building teachers' content knowledge and pedagogical content knowledge and be based on current and confirmed research.

¹ The work group had access to preliminary analyses from an EdSource study of math and English language arts. The main study findings on middle school practices, released February 24, 2010, should fill a gap in our knowledge about the implementation of standards-based instructional materials and the relationship between implementation and achievement results for students. We are grateful to EdSource for informing our work and recommend that state leaders examine the study carefully.

² The Center for the Future of Teaching and Learning (CFTL) recently released its annual report on the status of the teaching profession in California. The report supports and amplifies our observations. CFTL notes that “there is often a mismatch between the preparation and experience of teachers and the educational needs of their students... Further, our research finds that there is little connection between what teachers *need* to implement various strategies to improve high schools and the professional development they *get*.” (Source: www.cftl.org)

In addition, the CTC should consider creating a new assessment tool to measure teacher credential candidates' math content knowledge prior to obtaining a multiple subject authorization. Specifically, we recommend that the CTC and SBE **examine the current assessments for performance of teacher candidates and determine whether they adequately measure teachers' knowledge of math content and pedagogy.** We have the useful example of the Reading Instruction Content Assessment (RICA), which appears to have had an effect on the quantity and quality of reading instruction in multiple subject teacher preparation programs. Any new math assessment should focus on the interaction of content knowledge and pedagogical content knowledge and should not duplicate existing requirements (e.g. the Teacher Performance Assessment).

Professional Development

For the current teaching and principal corps, we believe that intensive investments are needed to build their capacity to deliver and lead effective math instruction. We recommend that the Administration, the SPI and the Legislature **create a comprehensive state policy to train all K-12 math teachers on the Mathematics Framework, current and confirmed research regarding math pedagogy, and math instructional materials, including the use of algebra readiness and intervention materials.** Such a policy should emphasize the urgent need to better support teachers in the upper elementary and middle school grades.

With this policy focus, the Administration, the SPI and the Legislature should **expand the existing intensive math professional development program (commonly known as SB472) to align the core curriculum, algebra readiness instructional materials, and intervention materials.** While applicable to all grade levels, expanded use of this professional development approach is particularly important now for teachers in the upper elementary and middle school grades. Training should also encompass the effective use of student assessment data, as well as effective instructional practices. Principals and district administrators, too, should receive training on the use of data and effective instructional practices.

Finally, we emphasize the need, through both professional development and teacher preparation, **to invest in the training and development of elementary math specialists who can deliver effective instruction to students and coach teachers in effective practices.** Populating our elementary schools with more math experts has enormous potential to shift the culture and practice of teachers.

Student Assessment

The current state assessment system in California is designed to measure achievement at the school district and school-site level. Local communities need a more comprehensive system of assessments to drive improvements in instructional practice and systems of support. We note a wide range among local communities in the degree to which they have put in place and effectively used formative and diagnostic assessment tools to complement the summative state assessments.

Since the current state student assessment system will be "sunsetting" in 2011, we believe that the timing is right for the Administration, the SPI and the Legislature to **initiate a comprehensive conversation focused on ensuring that state assessments deeply measure achievement of the California Mathematics Standards.**

Meanwhile, we encourage CDE to support local communities by **creating test item banks and diagnostic assessment tools that teachers and principals can readily access and use**. Such tools would help even the playing field among local communities in terms of their access to more comprehensive assessment systems.

Finally, we had a robust discussion about the California High School Exit Exam (CAHSEE) as it relates to student success in Algebra I. Currently, the CAHSEE assesses student understanding in only a few algebra standards; this observation prompted some work group members to call for greater alignment between the content of the CAHSEE and our expectation that all students be successful in Algebra I. Other work group members expressed concern that including more algebra content in the CAHSEE would further raise the stakes for students; they argued that such changes should not occur until the State has made much more substantial investment to support students and teachers. While we did not arrive at a specific recommendation, we encourage state leaders to continue discussions about the CAHSEE's role in state assessment and accountability system.

Accountability

California's accountability system is designed to measure school and district effectiveness. The federal government has challenged specific aspects of the state's system as it relates to mathematics. While California needs to respond to federal compliance issues, the upcoming reauthorization of ESEA presents an opportunity to seek greater alignment between the state and federal systems. Specifically, we recommend that CDE **work with the federal government under the reauthorization of ESEA to promote an accountability model that measures individual student growth**.

At the same time, our conversations surfaced opportunities to fine tune the current state accountability system. We recommend two changes. First, as part of the reauthorization of the Public School Accountability Act, the Administration, the SPI and the Legislature should **ensure that the Academic Performance Index (API) adequately captures individual student growth**. This would create a clearer signal to local communities about the importance of attending to students' progress over time.

Second, the Administration, the SPI and the Legislature should **establish state policy that students who score proficient on the CST in Algebra 1 would be exempt from taking the math portion of the CAHSEE**. We offer this as a way to signal the centrality of success in algebra to the state's policy system. We also encourage state K-12 leaders and leaders of the public post-secondary systems to explore alignment between measures of algebra proficiency with admissions and placement procedures in community colleges and four-year colleges.

We had robust discussions about two additional issues related to the state's accountability system. We discussed the definition of "student success" in algebra, noting that the term can refer to course completion or student proficiency as measured by an objective assessment. While we did not arrive at a specific recommendation related to this issue, we encourage local districts to examine the rigor and quality of their Algebra I courses to ensure that curriculum is aligned to the state standards, and is consistent across classrooms and schools, in a way that gives all students an opportunity to be successful on the CSTs.

We also discussed the fact that the state accountability system rewards school districts for having students assessed in Algebra I by eighth grade. Some work group members

supported this incentive, while others considered it counter-productive to the goal of all students succeeding in Algebra I. While we did not arrive at a specific recommendation related to this issue, we encourage state leaders to revisit the issue in conjunction with the implementation of our other recommendations.

Student Support

Building on this last consideration, we emphasize that accountability needs to be coupled with significant support for students. Getting all students to be successful in algebra requires a long-term commitment to each student from their point of entry onward. We recommend that CDE **support local communities to develop an Algebra I success plan for every student no later than sixth grade and ideally earlier**. Such a plan would necessarily include formative assessments to determine when a student would be ready to take Algebra I, as well as the supports (e.g. increased instructional time) needed in advance to ensure success.

Final Thoughts

We know that getting significantly larger numbers of students to be successful in algebra will require both more resources and better use of existing resources. We also know that these recommendations come at a time when California is facing nearly unprecedented economic and fiscal challenges. Many of the priority activities outlined in this document (i.e., professional development, increased instructional time, instructional materials) have significant costs that the state does not have the resources to cover. However, rather than wait for better times, we believe that state policy leaders should have a long-term roadmap for improvements to the system. Further, leaders should seize on any opportunities to bring resources to bear to support the improvements in math education. That includes prioritizing improvements to the math policy system in California's Race to the Top application and encouraging local school districts to prioritize algebra readiness activities in the use of existing state and federal funds and in seeking new federal resources.

Lastly, we want to ensure that our recommendations are not interpreted to suggest Algebra I as our highest expectation for students. To the contrary, it should be the minimum, as it is the gateway to higher learning in mathematics, as well as student success in college and career.

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