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February 12, 2009

No topic in education in California has attracted as much attention in the past six months as the decision by the State Board of Education to implement testing in Algebra I for all eighth graders. While this decision has been put on hold by court action, the concept will not go away and the underlying problems will continue to exist.

Whether a student takes Algebra I in the eighth grade or later in high school, it is imperative that the student be ready for Algebra when he/she takes the course. The earlier a student takes the course, the greater the possibility of continuing in the college prep math sequence but pushing students into Algebra without giving them the tools to succeed is both harmful to the student and ultimately unproductive.

Attached to this cover letter is one of the outcomes of the October 2008 Algebra Summit, which is a white paper on **"A Strategy for the Algebra I Success Initiative in the Silicon Valley."** The focus of this strategy paper is the development of programs and policies that will lead to greater success by all students taking Algebra I in Silicon Valley.

The paper is based, in part, on the results of a day-long summit on the subject hosted by the Silicon Valley Education Foundation, National Semiconductor, the Silicon Valley Community Foundation, and the *San Jose Mercury-News*. The Foundation wishes to thank the presenters, participants and co-sponsors for their help in making this event a success.

Special thanks are in order to John Fensterwald of the *San Jose Mercury-News* both for acting as moderator of the summit and for his assistance in reviewing this strategy paper. Thanks go as well to the many educators and panelists who reviewed all or part of the paper and assisted with prioritizing recommendations.

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A Strategy for the "Algebra I Success Initiative" in the Silicon Valley

The Silicon Valley Education Foundation
February 5, 2009

INTRODUCTION

"What is algebra exactly; is it those three-cornered things?"
- James Matthew Barrie

On July 8, 2008, the California State Board of Education (State Board) voted to implement Governor Arnold Schwarzenegger's proposal to require all 8th grade students to be tested in Algebra I within three years. The effect of this testing requirement is that all 8th graders will be expected to take Algebra I by the end of the three year deadline. Entitled the "Algebra I Success Initiative," the mandate has far reaching affects in the areas of professional development, instructional materials, teacher recruitment and retention, and student support.

Although the Sacramento Superior Court issues an injunction on December 18, 2008 preventing immediate implementation of the State Board of Education's decision, it is likely that Algebra I will be come at least the *de facto* standard 8th grade math class in the next few years.

Today's global economy and the dynamic, innovative Silicon Valley depend upon students who have mastered algebra. At its essence, algebra is about critical thinking and problem solving. And those skills are sought after and are getting harder to find by the many industries that depend on employees with a strong foundation in mathematical thinking. Many students can succeed in Algebra I at the middle school level, and that is what encouraged the State Board to push the initiative to learn the skill as early as possible. Despite the fact that the debate continues in the education community on whether this was a prudent decision, it is incumbent on us to ensure the mandate is successfully implemented.

Preparing all California 8th graders for success in Algebra I will not be a simple task, but one that will require a system-wide effort. It moves the discussion from mathematics at the middle school to instruction throughout K-12, and support throughout for students and teachers.

On Friday, October 10th, 2008, the Silicon Valley Education Foundation hosted a day long summit - "*Algebra for All: What Will It Take*?" School administrators, teachers, school board trustees, university professors, business leaders, legislators, and

community members participated in panel discussions and brainstorming sessions in an attempt to design a Silicon Valley regional approach to address the Algebra mandate with collaborative, innovative strategies.

The goal of this paper is to outline a roadmap to successful implementation of the mandate rather than to reargue the case for and against the mandate.

LISTEN TO SOME OF THE VOICES

"As long as algebra is taught in school, there will be prayer in school."

Cokie Roberts
ABC News

"The goal of all students in Algebra 1 is laudable, and it's happening all across the state, but prudence to ensure all students fully grasp math concepts before forcing them into the next course drives educators first and foremost."

Sherry Skelly Griffith
Legislative Analyst
Association of California School Administrators

"I truly believe that with enough support, all students can succeed in algebra in the eighth grade. If the governor had consulted an eighth grade teacher, principal, or district superintendent or reviewed data about eighth grade achievement in math, what he would have heard and seen is that while the number of students taking algebra has greatly increased, proficiency has not. Our system simply has more work to do to put in place the necessary tools to ensure every child is ready to participate and succeed in algebra."

Jack O'Connell
State Superintendent of Public Instruction - California

"Algebra is the gateway to critical thinking, pivotal for success in science, engineering and technology. How many times must California hear the warning that if we do not invest in our human capital – in K-12 math and science – we will be unable to maintain our leadership in a global economy? We have made significant gains in enrolling students in Algebra I in eighth grade in recent years, surpassing other states in the U.S. But we must set our goals higher. In 2007, California's eighth graders ranked 44th in the nation in mathematics achievement. Internationally, eighth graders in the United States are outperformed in mathematics by their counterparts in Singapore, South Korea, Hong Kong, Taiwan and Japan, as well as Belgium, the Netherlands, Estonia and Hungary. We must prepare our children for a knowledge-based economy in which algebra is the cornerstone."

Arnold Schwarzenegger
Governor - California

"The research has been pretty clear that Algebra 1 is a gateway course. We wanted to make it clear we're going to give all kids the opportunity to go through the gateway. We will not have a two-tier system in middle schools. . . We've been doing a terrific job of getting more kids into algebra. We see this less as a hammer than as urging the state to get across the finish line . . . The good news is we've never heard this level of conversation about what it will take."

Ted Mitchell
State Board of Education – President

"Algebra is a way of thinking and a set of concepts and skills that enable students to generalize, model, and analyze mathematical situations. Algebra provides a systematic way to investigate relationships, helping to describe, organize, and understand the world. Although learning to use algebra makes students powerful problem solvers, these important concepts and skills take time to develop. Its development begins early and should be a focus of mathematics instruction from pre-K through grade 12. Knowing algebra opens doors and expands opportunities, instilling a broad range of mathematical ideas that are useful in many professions and careers. All students should have access to algebra and support for learning it."

National Council of Teachers of Mathematics
"Algebra: What, When, and for Whom"

RESEARCH FINDINGS

Helping to Prepare for Algebra

CST Algebra I results for the last three years (2006-2008) show that the number of students taking Algebra I in the 8th grade has leveled off at about 50% of the state's 8th graders after 3 years of steady increases from the low 30% range. Achievement results have also leveled off with students performing at 38-43% Advanced/Proficient and 31-34% Below Basic/Far Below Basic. Districts which had conservative 8th grade Algebra I placements as reflected in their students 7th grade CST Math scores generally had much better Algebra I results than districts which had more aggressive placement policies. (Kriegler & Lee, 2000).

The research literature on the preparation of students for algebra does not seem to support, or even discuss, the idea that some students are not developmentally ready to tackle algebra in the 8th grade. Many speakers and audience members at the Algebra for All Summit, most of whom are practitioners in the field, seconded this view. Rather, there is a large body of research that many students are simply not prepared for the course. Further, there is general agreement that English learners students are even less well prepared.

The recently release Brown Center/Brookings Institution study (Loveless, 2008) reports that the number of 8th grade students with low math abilities enrolled in Algebra I nationally has grown from 8% to 28% in the period of 2000-2005. The study suggests that these students not only are not receiving any educational benefit from taking Algebra I but are having a detrimental effect on the achievement of the rest of the students because teachers are spending time on remediation rather than teaching the difficult concepts of algebra. (Loveless, 2008)

The National Mathematics Advisory Panel Final Report and the reports of its Conceptual Knowledge and Skills Task Force and Learning Processes Task Force provide an outline of what students need to be able to do to be successful in Algebra I. They find that "fluency with whole numbers and fractions" are needed to be successful. They determined that "proficiency with fractions is the most important foundational skill." They also found that learning fractions is dependent on "learning arithmetic facts." (National Mathematics Advisory Panel, 2008)

Teacher Preparation and Readiness

The Center for the Future of Teaching and Learning reports that 32% of the teachers of middle school algebra do not have a subject matter credential in math and may not have the background and preparation necessary to teach the course. They go on to report that the number of middle school students being taught Algebra I by mis-assigned or "out of field" teachers rose from 73,000 in 2004 to over 74,000 in 2007. At the high school level they report over 2700 math teachers are teaching out of field or do not have a credential (an increase from 2000 in 2004).

Their report, *California's Approach to Math Instruction Still Doesn't Add Up*, claims that the problem is exacerbated by a student enrollment bulge in the middle grades expected to peak in 2009, existing and permanent shortages of fully prepared math teachers and the retirement of one-third of the teaching force by 2017. (Centerviews, 2008)

Loveless, in the Brown/Brookings study, reports that the teachers of the "misplaced" students that he focused on are more likely to have taught for less than five years, less likely to hold a regular teaching certificate, and less likely to have majored in mathematics. (Loveless, 2008)

The Center for the Future of Teaching and Learning issued its report, Teaching and California's Future" in 2008 (Guha et al, 2008). It noted that one-third of middle school algebra teachers are either underprepared or are teaching out of their credential area. The state's lowest performing schools are more likely to have teachers who are underprepared to provide math instruction. Among middle schools scoring in the bottom quartile on the state standards test in Algebra (California Standards Test), just over half of algebra teachers (54%) have an authorization to teach math. By comparison, 70 percent of algebra teachers in schools scoring in the highest quartile were fully authorized to teach the subject.

GENERAL RECOMMENDATIONS

Successful engagement of all students in algebra by 8th grade will require courageous conversations, out of the box thinking, leadership, and collaboration between school teams, Boards of Education, districts, and the broader school community of business, legislators, and leaders. We recommend that school districts create policies for teacher training, student support, and administrative capacity to address issues related to algebra. The following recommendations were a result of presentations by experts at the Algebra Summit, by consulting education leaders, and by current research in algebra.

Pre-Service Teacher Training

Teachers in credential programs are in an ideal situation to help address the algebra challenge. College and university credential programs should focus heavily on the needs of English Learners, not only for the vocabulary and foundational skills for mathematics, but for all subjects. While pre-service teachers have a requirement of a methods class in math, many are able to "test out" of the class if their CSET scores are high enough. There has to be a middle ground between the skills necessary to understand math to complete a test and the needs of students to have teachers competent in understanding how math works.

General subject programs should offer math specialist credential enabling teachers to have a strong background in math. At the least, credential programs should add an additional elective course to provide teachers with an additional semester of math pedagogy. This would address the issue of teachers who emerge from credential programs with little more math experience than was required for entrance to college in the first place. Without a deep understanding of mathematical concepts, elementary teachers often have difficulty teaching the basic math concepts, responding to students who find alternative problem solving strategies not directly outlined in the textbook, and envisioning what it is that students need for success in future math classes.

Finally, there are currently few credential programs that offer specialist components for teacher of math at the elementary level. The State Department of Education is currently gathering input to explore current credentials and how a math specialization, in its current form in credential programs where it is offered, can be altered to better meet the changing needs of the educational system. The State of Arkansas has gone so far as to introduce a new requirement specifically for teachers of 8th grade Algebra I who, in the past, would have had only an elementary credential. (Cavanaugh, 2008) The State of South Dakota has teacher credential programs that have added a "math specialist" authorization so that interested educators can be "be recognized for their skills and ability to mentor others in the math realm." (Cavanaugh, 2008a)

Professional Development

A Santa Clara County P-16 Council should be convened to coordinate regional efforts within and amongst districts, particularly in the creation of 6th – 12th grade vertical teams. A vertical team of a teacher or more from each grade level allows for clearer articulation regarding content and pedagogy to address student needs. The Council can then share best practices as they relate to teacher training in both math content knowledge and academic language.

Professional development activities around content and academic language, as well as key standards and skills to build algebraic thinking, should be implemented during the 2008/2009 school year for teachers in grades 4, 5 and 6; the teachers in these grades will be the first to have their students assessed when the mandate takes effect in 2011.

District/county trainings should also empower teachers to use the adopted textbook as a guide, while understanding and focusing on the big ideas, rather than stay true to a strict pacing guide or calendar. By doing so, extra time needed to solidify foundational algebraic concepts could be used. Professional development should also focus on math instruction for the English Learners (EL) student. EL students require more pre-teaching with new vocabulary, scaffolding for new ideas that can be attached to those previously learned, and an overall focus on better concept development of academic language.

Administrative Capacity

District and school site administrators should act regionally and address issues surrounding teacher training, student support, and early intervention. A duplication of efforts to work with consultants and trainers should be avoided, with districts teaming up to share in the expenses and teacher discussion sessions.

Principals and assistant principals need to be creative when assigning teachers to teach certain courses. Stronger teachers should be considered for lower-performing students. In unified districts, site administrators may want to consider placing fully-credentialed math teachers in elementary schools to instruct only math at the 4th and 5th grade levels. Creative scheduling might also include math teachers coaching regular education and Special Education teachers.

The process of placing middle school students into math classes requires transparency. If students appear to be tracked on the basis of educational factors, such as a lack of foundational math skills needed for that grade level, parents should be informed of their child's level and any class design that is intended to meet the needs of "low," "middle," and "high" performers. Every student should be re-evaluated so as not to end up in the traditional tracking model of staying in one class simply because an evaluation early in the school year earmarked a child to be on a certain track from elementary to middle to high school. In order to successfully accomplish this, a model program needs to be identified where successful strategies for assimilating students into a new, higher academic program have been designed.

Curriculum Review and Integration

Key core concepts of algebraic thinking should be identified by district-wide teams of teachers and math coaches that span the spectrum of math classes, going back as early as kindergarten. All math teachers, regardless of level, need to have a clear concept of the entire math curriculum.

It is recommended that schools create a culture that values math. At the elementary level, a more natural connection exists with parent involvement and support of their children in math, like attending Math Nights and Family Math events. However, when students enter middle and high school, those connections are much more tenuous. At both of those levels, school staff needs to foster school cultures where it is cool to learn math and participate in math activities~~,~~ such as Math Competitions.

Student Support & Interventions

There are a variety of student supports and interventions that can assist those students who are nearing 8th grade as well as better prepare those in earlier grades so that they are ready for Algebra I when the time comes. These programs need to stress the use of academic language, a necessary foundation for all learning. In particular, K-8 programs need to emphasize mathematics vocabulary as a distinct vocabulary that often differs

from regular conversational vocabulary. Programs for students in grades 5-7 should focus on operations with fractions along with problem solving skills with a real world emphasis. For many students in middle school it will be necessary to provide weekend and summer support programs to ensure that students beginning 8th grade Algebra I are not starting off unprepared.

Materials & Adoptions

Last year the State Board of Education adopted several Algebra Readiness programs and texts for middle school. These materials need to be made available for summer and weekend intervention programs as well as the regular 5th-7th grade math classes. In addition, current adoptions in all grades should be reviewed so that the portions of those materials which foster algebra readiness skills are highlighted along with the examples and exercises elementary teachers can use to promote algebra readiness.

Assessment

The current CST in Algebra I focuses on simple computation and some answers can be determined by simply evaluating each of the answer choices. Since Algebra is a tool for understanding and communicating about mathematical situations, rather an end in itself, the test ought to focus on standards that foster true problem solving and algebraic reasoning. This type of change requires advocacy from all stakeholders, especially the California Department of Education and the State Board. Further, district and teacher made assessments must be designed to incorporate this problem-solving approach.

Policy

Stakeholders need to advocate for a shift of SB466/SB472 funds (when they are reinstated in the state budget) from state to county/regional professional development efforts. Virtually all teachers at the Summit claimed that these state run trainings were not as valuable due to the lack of local follow-up, and that locally provided professional development was superior. The advantage to a state shift to county or regional efforts would be that local needs could be met with trainings closer to the classroom, with teachers taught by other local teachers and instructional leaders available for follow-up support. Furthermore, AB472 funds should be available for all teachers, and not just those in low-performing schools or those whose schools are currently eligible based on state prioritization levels.

Funding efforts need to be redirected to better support remediation for students who need it and basic inequities in funding need to be addressed. While this effort may need to take place in the context of a complete overhaul of the state funding mechanism as many have advocated, pressure should be brought to bear to deal with immediate needs in this area.

The business community was a major advocate for the decision to move toward universal 8th grade algebra and their involvement and support will be crucial to its success. This support can come in many ways including financial support for the necessary intervention programs, teacher training and professional development programs, materials purchases and advocacy.

REGIONAL CONCLUSIONS

An expert panel was convened at the end of the Algebra Summit to strategize the needed "next steps" for a regional initiative to address the "*Algebra I Success Initiative*." The panel was facilitated by John Fensterwald of the San Jose Mercury News and consisted of:

* Dr. Hilda Borko, Professor at Stanford University
* Dr. David Foster, Director of Mathematics for the Robert Noyce Foundation
* Dr. Michael Kirst, Professor Emeritus at Stanford University and former California State Board of Education Chair
* Dr. John Porter, Superintendent of the Franklin McKinley School District, San Jose
* Dr. Chuck Weis, Superintendent of the Santa Clara County Office of Education

Waiting for the state to reach final decisions on 8th grade Algebra is time wasted. Years ago Santa Clara County decided that it couldn't wait until highway funds were available to build Highway 85. Instead we went ahead as a county, built the road and took the lead. We should replicate that effort with 8th grade Algebra I. Acting on a countywide and regional basis will leave us better prepared to ensure that we are the most successful county in the state when Algebra I for all 8th graders becomes a reality.

The conclusions summarized here are what we feel are the most strategic pivot points to prepare Silicon Valley students to successfully complete Algebra I by the end of 8th grade. These conclusions were recommended by the expert panel, strategies shared by other panelists during the Algebra Summit, and feedback from other experts and practitioners in the field. Once recommendations were gathered, they were fully vetted and ranked by attendees at the Algebra Summit and appear below as program and advocacy recommendations in rank order, with the ones viewed as "most important" appearing above others viewed as "less important."

While recommendations may be vast, and ours may not include all possible solutions, the following address the most widespread and urgent issues facing our county *(possible actions in support of these recommendations by SVEF are indicated in Italics):*

Program Recommendations:

1. Intervention programs should be instituted for students in early grades who are already falling behind in math. Programs such as Mathematics Navigator created by "America's Choice and the National Center on Education and the Economy (NCEE),"

ST Math by the MIND Research Institute, and EPGY from Stanford University help students who are falling behind or are dealing with misconceptions from partially learned math material. *SVEF could seek funding or partnership opportunities to assist districts with implementation of these types of programs.*

2. While there is no elementary NBPTS certification available in math, it may be possible to create a local "Elementary Math Specialization" certificate. Working with local universities, districts and the Santa Clara County Office of Education, a program could be created through which K-6 teachers could demonstrate special proficiency in math instruction through a combination of course work, professional development, mentorship and demonstration that would allow these teachers to be recognized for their expertise thus creating a cadre of "Math Fellows" who can be called upon to assist other teachers and improve instruction for all students. *SVEF could provide the leadership in bringing together the parties necessary for the creation of such a certificate program.*

3. Algebra readiness programs are needed now more than ever. The State Board of Education has approved several of these. NCEE's Ramp-Up to Algebra focuses on both the need for academic language and special assistance for EL students while providing the essential math background needed for Algebra I. *SVEF could seek funding and/or support partnerships to assist districts with implementing this type of program.*

4. Summer school intervention programs have, in the past, shown great success in preparing students for advanced math. Programs such as the Jose Valdez Math Institutes and SVEF's Stepping Up To Algebra (SUTA) are models which should be revitalized and/or expanded to get students in grades 5-7 ready for 8th grade Algebra I. *SVEF should focus the SUTA program on students between 7th and 8th grades and seek to expand it beyond the 450 students served in Summer 2008.*

5. Math teachers need to talk to one another and a mechanism needs to be put in place to facilitate these conversations. These conversations need to take place both vertically and horizontally. Vertical teaming between math teachers in grades 6-12 are essential so that students are well prepared in the years leading up to Algebra I for future math success. In addition, K-5 teachers need the opportunity to learn how their work fits into the larger math curriculum. This is accomplished more easily in unified districts than non-unified but steps need to be taken to cross-district boundaries and create a collegial, non-adversarial atmosphere in which everyone is working towards the same goals. Similarly, districts need to provide the opportunity for similar grade level conversations to take place to promote the sharing of teaching ideas and concepts. *SVEF could provide facilities and opportunities for discussions to take place and through the Math Fellows concept discussed above as well as provide facilitators to get discussions under way.*

6. Ongoing math professional development programs, such as those conducted under the auspices of Intel, the Noyce Foundation and Foothill College, should be continued and, where possible, expanded. There is no "one size fits all" solution to professional development. The availability of a variety of professional development avenues for

Santa Clara County math teachers is a strength in our valley. It is essential that math teachers both "know their math" and know how to teach it. This is especially true in the early grades where teachers are much more likely to be generalists rather than specialists in math. Creation of professional development programs for early grade math teachers is necessary. Programs designed to "coach the coach" and programs focusing on assisting teachers with English Learner students should be a priority. This can also be an area where the Santa Clara County Office of Education can continue to provide services. *SVEF could support ongoing professional development efforts, act as a clearinghouse for professional development opportunities, and support district activities in this area.*

7. Creation of a "Math Culture" in our schools and among students that values math and math achievement is an obtainable goal. This goal can be achieved through a variety of means, including:

- Create math clubs at all grade levels. An organization called Math Counts (http://mathcounts.org/) has free information and materials for schools to set up math clubs at school.
- Hold math family nights at schools as well as encouraging participation in math contests. Math Matinee of Palo Alto (www.mathmatinee.com) and Math Family Night: Count Me In (http://techteachers.com/mathweb/familymathnights.htm) have free or inexpensive materials for math family nights for schools. The California Mathematics Council also offers math festivals (www.cmc-math.org).
- Encouraging participation in math contests. The Santa Clara Valley Mathematics Association (SCVMA) has many math contests and field days for students in our valley.

SVEF, through its Teacher Innovation Grant program, can provide financial resources for these types of programs.

8. Encouraging teachers to participate in the National Board for Professional Teaching Standards certification process in mathematics will help create a body of mathematics expertise in both content and pedagogy. Currently NBPTS offers two certificates in math: Mathematics/Adolescence and Young Adulthood for teachers of 14 to 18 year old students (essentially high school) and Mathematics/Early Adolescence for teachers of 11 to 15 year old students (essentially middle to early high school). Board certification is a rigorous and expensive process for teachers. Fees run approximately $2,500- $3,000. While some districts may offer some compensation incentives, these are not universal. Districts should consider providing assistance in math and other targeted fields. *SVEF could provide reimbursement for costs for Board Certification in mathematics to teachers in Santa Clara County and advocate for districts to provide financial incentives to teachers who become board certified.*

Advocacy Recommendations:

1. Funding flexibility, especially in difficult financial times, will be essential for districts to implement 8th grade Algebra I and provide the remediation resources necessary for

some students. *SVEF, together with district and county leaders, could advocate at the state and district level for creative, flexible use of funds to implement programs.*

2. Funding is needed to support remediation at all levels. Improvement in math instruction in the early grades will, in the long term, ensure Algebra I success for students in the future. Students already in the pipeline cannot be ignored. Intervention programs during summer school, after school and Saturday school must receive funding. A good example of this can be found with the City of San Jose's Homework Center program. State funds for summer school have not fully covered the actual costs of operating summer programs and these funds will be in danger in a period of state cutbacks. *SVEF, working with districts and other partners, can advocate for continued summer school and other intervention funding with local legislators and the private sector.*

3. Former California Secretary of Education Marian Bergeson, who served from 1996 – 1998 under Governor Pete Wilson, has proposed that state adopted Algebra Readiness materials be used in 7th grade math classes to prepare students for success in Algebra I in the 8th grade (Bergeson 2008). Eleven Algebra Readiness programs currently exist on the approved state instructional materials list. Middle schools can use their instructional materials budget for these materials, but only if the texts are used with students in the 8th grade. *Algebra Readiness materials need to be accessible for students in 7th grade and the State Board of Education needs to add the readiness texts to the approved list of 7th grade materials.*

4. Districts should be encouraged to use creative scheduling to get more math specialists into elementary classrooms. Programs wherein a math specialist spends a concentrated period of time with a class while the regular teacher has prep time or collaborative time should be investigated and implemented at least on an experimental basis. *SVEF could serve as a clearinghouse for private funding for a pilot program in one or two schools.*

5. Districts need to take a hard look at how federal Title I and other funds are being used to improve mathematics instruction. Math should be a target area for these funds. Furthermore, the federal funds that districts receive can be used as a match for private matching grants, such as grants from foundations. *SVEF can serve as a clearinghouse for private funding to schools that direct Title I dollars to improving math instruction in general and preparing for 8th grade Algebra I implementation.*

REFERENCES

Achieve Policy Brief. (May 2008). The Building Blocks of Success: Higher Level Math for All Students.

Bergeson, Marian. (2008, December 22, 2008). Opinion: There's A Better Way To Get Kids Ready for Algebra. *San Jose Mercury News,* p. A12.

Cavanaugh, Sean. (2008). 8th Grade Algebra Teachers in Arkansas to Need State Nod. *Education Week,* 28(9), 1.

Cavanaugh, Sean. (2008a). Math Specialists Roam South Dakota to Help Elementary Teachers. *Education Week,* 28(10), 8.

Centerview Policy Brief, Center for the Future of Teaching and Learning (July, 2008). California's Approach to Math Instruction Still Doesn't Add Up.

Driscoll, Mark. (1999). Fostering Algebraic Thinking: A Guide for Teachers, Grades 6-10. Heinemann. Portsmouth, NH.

Guha, R., Shields, P., Tiffany-Morales, J., Bland, J., & Campbell, A. (2008). California's Teaching Force 2008: Key Issues and Trends. Center for the Future of Teaching and Learning. Santa Cruz, CA.

Kriegler, Shelley & Lee, Teresa (2000). Using Standardized Test Data as Guidance for Placement into 8th Grade Algebra. Available at: http://www.introtoalg.org/downloads/Algebra_8th_Grade_Paper.pdf Accessed October 10, 2008.

Loveless, T. (2008). The 2008 Brown Center Report on American Education: The Misplaced Math Student – Lost in Eighth-Grade Algebra. September 2008. Brown Center on Educational Policy at Brookings.

National Academy of Sciences. (2006). Adding it up: Helping Children Learn Mathematics. National Academy Press. Washington, D.C.

U.S. Department of Education. (July 30, 2007). Institute of Education Sciences. Middle School Math. What Works Clearinghouse.

U.S. Department of Education. Institute of Education Sciences. (March 26, 2007). I CAN Learn Pre-Algebra and Algebra. What Works Clearinghouse.

U.S. Department of Education. (2008). The Final Report of the National Mathematics Advisory Panel.

Vogel, C. (May 2008). Algebra: Changing the Equation. District Administration: Magazine of School District Management. Available at: http://www.districtadministration.com/viewarticle.aspx?articleid=1581. Accessed October 4, 2008.

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About Silicon Valley Education Foundation (SVEF):

SVEF is the education foundation for advocating the needs of all 34 districts in Silicon Valley. SVEF seeks to improve public education through establishing effective partnerships with both the private sector and the education community. We focus on the needs of our constituents: students, families, teachers, community, and education leaders. We listen to their needs and seek to understand their challenges. We then work to provide them with innovative solutions.