

**Alhambra Institutes in Mathematics (AIM)  
2005-2008 Local Evaluation Report**

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## I. Introduction

Since March 2005, the Alhambra Institutes in Math (AIM) project has focused on improving Mathematics achievement among underachieving middle school students through the provision of high – quality professional development for teachers in grades 6-8. Funded through California Math Science Project (CaMSP), the AIM project proposed to involve 30 teachers in professional development that combined coursework for credit taught by UCLA Math Content Program for Teachers (MCPT), in- class coaching, student work analysis, and lesson development based on UCLA’s LUCIMATH and KIDLUCI programs.

Teachers in AIM project were able to take UCLA MCPT’s curriculum of eight classes leading to California Supplementary Authorization in Math certification (with option to take four additional classes for Subject Matter Authorization). The curriculum emphasized problem solving, multiple ways (i.e., the “fourfold way”) while incorporating concepts and operations of real numbers, algebraic and geometric thinking, data and probability, and preparation for the California High School Exit Exam (CAHSEE).

Specifically, the AIM project addressed five critical needs of Alhambra teachers including:

1. Deeper understanding of core standards for K-8 math
2. A cohesive program that links adult learning to classroom practices
3. Instruction to meet the needs of special learners (especially English Learners)
4. Training to help minority students to achieve in math
5. Skills to adapt textbook lessons to student needs

### Project Goals/Outcomes

In 2005-2006, the AIM project developed the following specific goals linked to increasing the quality of middle school Mathematics teachers’ content knowledge and instruction:

- 30 teachers in grades 6-8 will complete 104 hours of intensive professional development and follow- up
- At least 10 teachers will receive State certification and NCLB compliance in mathematics
- AUSD teachers participating in AIM will demonstrate increased content knowledge of Mathematics through a written assessment

In addition, AUSD established the following student outcome goals:

- Increase the percentage of 6<sup>th</sup> – 8<sup>th</sup> grade students scoring Advanced or Proficient on the General Mathematics CST by 10%
- Increase the percentage of 8<sup>th</sup> grade students scoring Advanced on the Algebra CST by 20%
- Reduce the achievement gap in Mathematics by improving the scores of Hispanic middle school students

Project AIM was renewed by the California Department of Education for a second round of funding. In second cycle of funding, 2006-2008, AIM focused on:

- Continuing to offer content knowledge mathematics courses and coaching for 30 Cadre I teachers working toward State Single Subject Mathematics Certification with 25 teachers meeting the 208 hour requirement for intensive training and follow-up
- Adding a cohort of 15 (Cadre II) 5<sup>th</sup> grade teachers who would complete the 104 hour requirement for intensive training and follow-up

### **Evaluation Plan**

AUSD contracted with Public *Works*, Inc. to evaluate the AIM project. The evaluation was intended to meet the accountability and reporting requirements of the CaMSP grant while also providing on- going information that could, in turn, be used to improve and enhance the implementation of the grant. The evaluation was organized around the following tasks:

1. Collecting and analyzing data on teacher participation in MCPT training and professional development
2. Assessing gains in teacher knowledge linked to MCPT training and professional development
3. Analyzing district-wide student achievement in mathematics
4. Preparing progress and summative evaluation reports

### **Project Coordination**

Decision-making for the AIM project was exercised through an advisory group, which included the following members:

- Janet Lees, Director of Curriculum and Instruction
- Sunny Chin- Look, District Mathematics Instructional Specialist
- Shelley Kriegler, Director UCLA MCPT
- Cynthia Raff, Associate Director UCLA MCPT
- Michael Butler, Public *Works*, Inc., CaMSP Evaluator

This group met quarterly to discuss and plan grant activities, as well as to review data collected as part of the local evaluation.

### **Report Organization**

This summative report is intended to provide an assessment of Project AIM from March 2005 thru June 2008. Section II focuses on the impact of the CaMSP grant on teachers, including participation in professional development, assessment of Mathematics content knowledge, and teacher survey data. Section III of this report presents data on student achievement in Alhambra USD, including data on students taught by CaMSP teachers. Section IV provides conclusions on the AIM project in terms of goal fulfillment.

## II. Grant Impact on Teachers

### Cumulative CaMSP Training and Follow-up

Since March 2005, a total of 41 AIM teachers have participated in eleven intensive training courses offered by the UCLA MCPT. As shown in Table 1 below, the majority of AIM participants enrolled in Number Power II and Perspectives on Algebra. Many also took Topics in Algebra & Geometry. Concentrations of AIM teachers enrolled in Dealing with Data, More Topics in Data, Function Theory I, Perspectives on Geometry, and Function Theory II.

**Table 1: Teacher Participation in Intensive Training, Spring 2005 – Spring 2008**

Course Title	Number of Teachers Trained
Number Power II	33
Perspectives on Algebra	22
Topics in Algebra & Geometry	17
Dealing with Data	12
More Topics in Data	12
Perspectives on Geometry	11
Function Theory I	11
Function Theory II	10
Number Power I	9
Math and Technology	7
More Topics in Geometry	1

Source: Public Works, Inc.

Most Cadre I AIM participants met or exceeded the 104-hour requirement (80 intensive and 24 follow-up) for hours of participation between January 2005 and September 2006. Most (N=23) Cadre I AIM participants also met the 208-hour requirement (160 intensive and 48 follow-up) by September 2008. As shown in Table 2, 23 Cadre I teachers met the 208-hour requirement by September 2008. Indeed, the average Cadre I teacher in the AIM Project participated in 358 hours of intensive training.

**Table 2: Cadre I Teacher Participation in CaMSP, 2005-2008**

	208 +	160-207	104-159	80-103	48-79	24-47	1-23	0 hours
<b>Total Hours</b>	23	3	0	2	0	0	1	0
<b>Intensive</b>	21	5	0	2	0	0	0	0
<b>Follow-up</b>	0	0	2	6	7	7	5	1

Source: Public Works, Inc.

In the second year of the grant, 12 Cadre II teachers (four 5<sup>th</sup> grade, three 6<sup>th</sup> grade, three 7<sup>th</sup> grade, and two 8<sup>th</sup> grade teachers) participated in a special Number Power II course, which was co-taught with UCLA MCPT instructors by members of the Cadre I Leadership Team. As shown in Table 3, 10 of the Cadre II teachers met the 104-hour requirement of for intensive and follow-up CaMSP hours by September 2008.

Table 3: Cadre II Teacher Participation in CaMSP, 2006-2008

	104 +	80-103	48-79	24-47	1-23	0 hours
Total Hours	10	2	0	0	0	0
Intensive	12	12	0	0	0	0
Follow-up	0	0	0	10	1	1

Source: Public Works, Inc.

## Empowering Teacher Leaders

In 2006, AIM added a leadership cohort with the goals of building district mathematics leadership capacity through development of at least eight teachers leaders who would become mathematics coaches capable of designing, delivering, and sustaining in-depth professional development and on-going teacher support. This cohort was comprised of Cadre I teachers who demonstrated leadership at their school. There were two strands within the leadership cohort: Leadership Group and a pilot *Introduction to Algebra* course aligned to the State’s Algebra Readiness standards for 8<sup>th</sup> grade students unlikely to achieve proficiency in a regular Algebra course.

### *Leadership Group*

Five teachers in the Leadership Group participated in training intended to prepare them to lead a one- to three-hour professional development session at a special Number Power II course targeted to 5<sup>th</sup> grade teachers in AUSD (Cadre II) in Spring 2007. Each leadership participant delivered a modified version of a module from UCLA’s Number Power II course. Each participant was the lead presenter for one session and the support presenter for another. An instructor from UCLA conducted the other sessions.

Three meetings were held with the Leadership Group focused on understanding the theories of professional development and leadership and the use of technology in Mathematics content classes and presentation. After the lesson presentation, the lead and supporting presenter met with the instructor to debrief. The emphasis of these discussions was on identifying successful moments of the presentation, areas to improve upon and next steps for future instruction and leadership roles. In this way, AUSD began to cultivate sustainability for Mathematics teachers to lead professional development sessions and to take up further leadership roles within the district after the CaMSP grant. In fact, six AUSD teachers who were involved in the AIM project received subject matter authorization in Mathematics as a result of the training and professional development received through CaMSP; two additional teachers were at the filing process of subject matter authorization at the time of this report writing.

### *Introduction to Algebra Pilot*

In the second leadership strand, four 8<sup>th</sup> grade AUSD teachers implemented the *Introduction to Algebra* course. Designed by UCLA MCPT as an Algebra Readiness course for those 8<sup>th</sup> graders who are not ready for Algebra 1, *Introduction to Algebra* attempts to provide conceptual support and scaffolding for struggling students. Participating teachers attended monthly professional development sessions to review the materials with one of the UCLA coaches. At these meetings teachers reviewed all items for the month paying special attention to common pitfalls and new material. These monthly meetings also allowed time

for collaboration between instructors and feedback to UCLA MCPT. In this way AUSD sought to have a cohort of teachers capable of assisting future teachers charged with delivering this Algebra Readiness course.

### **Assessment of Teacher Knowledge**

All AUSD teachers participating in AIM training were required to complete the *Survey of Content Knowledge for Teaching Middle School Mathematics* developed by Learning Mathematics for Teaching (LMT), a research consortium of the University of Michigan School of Education funded by the National Science Foundation, and University of California Office of the President. This survey was offered as a pre-assessment in June 2005 to CaMSP participants. The LMT tests Mathematics content knowledge in the areas of Number & Operations, Algebra & Functions, and Geometry & Measurement.

In June 2005, the LMT survey was also administered as a pre-assessment to a “control group” of AUSD teachers who opted not to participate in AIM training. Thirty-one teachers were “matched” to the AIM participants in terms of school site and years of teaching experience to create the control group. On the pre-test, there were no statistically significant differences between the AIM teachers and the control group in terms of mathematical content knowledge (i.e., both groups achieved at an approximately equal level). Both groups performed best on pre-test items linked to Measurement & Geometry, followed by Algebra & Function, and then Number and Operations. AIM participants answered slightly more test items correctly compared to the control group teachers; however, these differences were not statistically significant.

**Table 4: Change in Teacher Content Knowledge in Mathematics on the LMT<sup>1</sup>**

<b>CaMSP Cadre I Participants June 2005 pre test - May 2006 post test</b>			
<b>CaMSP Cadre I Participants</b> (N=21 pre-test; N=18 post-test)	<b>Change in % Correct</b> (Pre vs. Post)	<b>Control Group</b> (N=31 pre-test; N=16 post-test)	<b>Change in % Correct</b> (Pre vs. Post)
LMT (entire test)	13%	LMT (entire test)	-2%
Algebra & Functions	8%	Algebra & Functions	-3%
Number & Operations	13%	Number & Operations	-6%
Measurement & Geometry	17%	Measurement & Geometry	2%
<b>CaMSP Cadre II Participants May 2007 pre-test and September 2008 post-test</b>			
<b>CaMSP Cadre II Participants</b> (N=15 pre-test; N=18 post-test)	<b>Change in % Correct</b> (Pre vs. Post)	<b>Control Group</b> (N=31 pre -test (June 2005); N=10 post-test)	<b>Change in % Correct</b> (Pre vs. Post)
LMT (entire test)	1%	LMT (entire test)	2%
Algebra & Functions	10%	Algebra & Functions	12%
Number & Operations	1%	Number & Operations	5%
Measurement & Geometry	-12%	Measurement & Geometry	-5%

Source: Public Works, Inc.

In May 2006, the LMT survey was administered again as a post-test to the AIM participants and those members of the control group who had not participated on any

<sup>1</sup> As a condition of use, the percent correct on the LMT cannot be presented in this report or any other public document.

CaMSP training. Table 4 shows that all of the Cadre I teachers made substantive gains (13% more of the test questions answered correctly) in Mathematics content knowledge as measured by the LMT. Gains in content knowledge occurred in all three domains of the test. AIM teachers continued to perform best in Measurement & Geometry, followed by Algebra & Functions, and Number Sense. By contrast, the “control” group of teachers not participating in CaMSP training declined slightly.<sup>2</sup>

Cadre II took the pre –test in May 2007 and the post– test in September 2008. On the pre-test, teachers again performed best in Measurement & Geometry, followed by Algebra & Functions and then Number Sense. For Cadre II, the gains in Mathematics contents knowledge were more modest (only 1% more test questions answered correctly) with the most gains occurring in the Algebra & Functions component of the LMT. Among Cadre II teachers, the “rank order” of the LMT shifted with post-test scores highest in Algebra & Functions, followed by Number Sense and then Measurement & Geometry (i.e., where these teachers had scored highest on the pre-test). Since Cadre II had pre- test scores that were similar to Cadre I and the control group pre- test scores, the May 2005 control pre –test scores were used to compare the scores of the 2008 post -test control group. The “control” group of Non-CaMSP teacher showed a slight gain (2%) overall with increases occurring in two of the three areas of the LMT.

### **State-wide Evaluation Results - Teacher Survey**

To complement the local survey of CaMSP participants, the evaluation also drew on the results of a survey administered as part of the state-wide evaluation. This survey included all AUSD teachers who participated in at least one hour of CaMSP training in each of the last three years.

**Table 6: Satisfaction with Training (% Top Two Ratings)**

	July 2006 (N=10)	June 2007 (N=41)	May 2008 (N=24)
<i>How satisfied have you been with the overall quality of professional development offered to date?</i>			
Overall rating of professional development	90%	94%	70%
Impact of training on my own teaching	80%	94%	65%
Pedagogy or instructional methods covered	90%	88%	75%
Content of professional development	90%	88%	75%
Focus on aligning teaching with the standards	90%	82%	75%
Quality of the trainers	90%	71%	50%
<i>To what extent did the training help you professionally?</i>			
Has increased my content knowledge	100%	94%	80%
Has provided instructional strategies, techniques, or pedagogical approaches	80%	94%	75%
Has convinced me of the importance of hands-on learning	80%	94%	75%
Has helped me to use state approved texts effectively	50%	83%	65%
Has helped me align instruction to the standards	80%	82%	55%

<sup>2</sup> Declines in the control group may be the result of self-selection as only about half of the control group also took the post-test.



<i>To what extent will training help improve student achievement?</i>			
Student grades in mathematics	90%	94%	75%
Student interest in mathematics	90%	94%	80%
California Standards Test (CST) Mathematics	80%	77%	85%
California High School Exit Exam (CAHSEE)	60%	65%	62%

Source: Public Works, Inc.

As shown in Table 6 above, teachers were most positive about the benefits of CaMSP participation on their content knowledge of Mathematics (80%) in the final year (2008) of the grant. Teachers also perceived CaMSP participation to be a benefit for student achievement on the California Standards Test (85%) and in raising student interest in Mathematics (80%). However, the central finding of the survey is that participants reported very high levels of satisfaction with the quality of professional development in the first two years of the grant (2005-2006 and 2006-07), with precipitous declines in teacher perceptions of CaMSP in the last year of the grant (2007-08). Indeed, teachers were increasingly less likely to credit CaMSP training and professional development with changes in their own content knowledge or pedagogical repertoire for teaching Mathematics (see Table 7 below). Compared to prior years where the overwhelming majority of CaMSP teacher participants were enthusiastic about the influence of professional development, access to high education partners, and peer interactions, less than half of all 2008 survey respondents said that CaMSP was helpful.

**Table 7: Rating the Helpfulness of Training (% Helped a Lot and % Some Help)**

<i>Helped in terms of developing knowledge of mathematics content</i>	July 2006 (N=10)	June 2007 (N=41)	May 2008 (N=24)	<i>Helped in terms of developing pedagogy and teaching methods.</i>	July 2006 (N=10)	June 2007 (N=41)	May 2008 (N=24)
CaMSP Professional development	80%	82%	35%	CaMSP Professional development	75%	76%	50%
One of my professors	80%	75%	40%	One of my professors	78%	59%	45%
My peers/team teaching	80%	69%	45%	My peers/team teaching	89%	82%	45%

Source: Public Works, Inc.

Nearly all teacher survey respondents noted that they were making a difference in the lives of their students in all of the past three years (see Table 8). More teachers noted that they could teach all students to high achievement level in 2008 compared to 2006. In addition, an increasing percentage of teacher respondents noted that student failure was tied to lack of applying themselves. Nonetheless, large numbers of teachers credited home environment and/or peer influence as a major cause of student performance. As such, the results on teacher efficacy were decidedly mixed.

In terms of teaching special populations and skills, AUSD teachers were more likely to say that they could effectively integrate technology into the classroom learning experience. Many more teachers also noted confidence in serving Special Education students.

**Table 8: Confidence and Ability of Teachers (% Strongly Agree and % Agree)**

<i>Rate your agreement with the following statements</i>	July 2006 (N=10)	June 2007 (N=41)	May 2008 (N=24)
<b>Efficacy</b>			
I am making a difference in my students' lives.	100%	100%	90%
I have the ability to teach all students to high achievement levels.	78%	88%	90%
Most of a student's performance depends on home environment.	77%	69%	75%
Students' peers influence their motivation and performance more than I do.	66%	41%	70%
When my students fail, it is because they do not apply themselves.	55%	65%	85%
<b>Teaching Special Populations/Skills</b>			
I am confident in my ability to effectively teach English Learners.	100%	100%	85%
I can handle most discipline problems that arise in my classroom.	100%	100%	100%
I am confident in my content knowledge to be creative with my instructional strategies	89%	100%	100%
I can effectively integrate technology into my students' learning experience.	56%	65%	85%
I am confident in my ability to effectively teach special education students.	33%	65%	65%

Source: Public Works, Inc.

## Evidence of Changes in Classroom Instruction

To examine changes to classroom instruction resulting from participation in the CaMSP grant, Public Works, Inc. conducted classroom observations of a sample of grade 6-8 classrooms taught by CaMSP participants in 2006-07 and 2007-08. Public Works, Inc also conducted teacher and student focus groups. Lastly, the evaluators met with district stakeholders and UCLA MCPT instructors assigned to the AUSD Cadre I and Cadre II teachers. Based on these qualitative data, the CaMSP grant has had the most impact on Mathematics instruction in the following areas:

- **The ability of teachers to teach and/or re-teach mathematical concepts in more than one way.** Teachers trained through the CaMSP grant tended to expand their repertoire of pedagogical techniques. This was clearest in the propensity of teachers to address mathematical *concepts* prior to (or alongside) the teaching of mathematical *procedures*. Students were positive about the willingness of teachers to differentiate instruction by re-teaching a concept in a different way or through a different learning modality when difficulties arose. Moreover, students noted that teachers were willing to accept alternative methods of problem-solving as long as the student could demonstrate how and why they used an alternative method.
- **The likelihood of teachers incorporating hands-on and real-life applications into Mathematics.** Teachers trained through AIM were more likely to embed project-based activities and to make explicit connections to mathematical applications as part of lesson delivery. Students in these classrooms noted opportunities for kinesthetic learning, increased use of realia/manipulatives during lessons, and more frequent discussions of how mathematics could be used in everyday situations and/or careers.
- **Higher-level questioning and dialogue in the classroom to check for understanding.** AIM training and professional development spurred more teachers to pursue explanations of the reasoning behind mathematical problem-solving in order to check for student understanding. During guided practice, teachers

expected more from students in terms of oral explanation and dialogue around mathematical concepts to check for understanding. Students became more accustomed to open-ended prompts from teachers and the expectation that they would be able to articulate their mathematical reasoning and respond to higher-level questions.

The impact of CaMSP training was less pronounced in terms of the following:

- **Collaborative grouping.** In some AIM classrooms, there was clear evidence of student working in small collaborative groups (typically in pods students but also peer-to-peer activities). In these classrooms, lessons incorporated scenarios for problem-solving and encouraged students to work together. Other classrooms relied upon whole group instruction and/or provided assignments to student groups without sufficient structure to be effective vehicles for enhancing student understanding of the standards being taught.
- **Explicit use of scaffolding and differentiation.** There was not widespread evidence of UCLA's "Four-Fold Way" as a tool for "scaffolding" the delivery of Mathematics or differentiating instruction. Few teachers consistently employed the "Four-Fold Way" to represent mathematical concepts and/or encouraged students to move between different learning modalities in a systematic way. Instead, the majority of teachers demonstrated openness to alternative methods of problem-solving, applied differentiation to select students, and encouraged student inquiry as part of classroom pedagogy.
- **Changes in pedagogy to close the achievement gap.** Scant evidence existed of teachers implementing specific instructional strategies or techniques to address the learning needs of minority (Hispanic) students in the context of majority (Asian) classrooms. Indeed, this grant goal was not clearly communicated or reinforced to AIM teachers who largely saw their charge as improving achievement for all students rather than accelerating the pace of improvement for one subgroup of students.

### III. Grant Impact on Students

#### California Standards Test Results

CST scores increased across every grade level (6-8) from 2004 to 2008 (see Table 10 Below). For example, the raw percentage of students scoring Advanced or Proficient increased 15% in 6<sup>th</sup> grade, 2% in 7<sup>th</sup> grade, 9% among 8<sup>th</sup> graders not enrolled in Algebra, 26% among 8<sup>th</sup> graders enrolled in Algebra, and -4% among 9<sup>th</sup> graders enrolled in Algebra. Expressed as a *rate* of improvement, AUSD met its goals for improving student performance by at least 10% on the General Mathematics CST for all but 7<sup>th</sup> grade. AUSD also met its goal of improving Algebra CST scores by 20% among 8<sup>th</sup> graders. However, it is important to note that score increased tended to “peak” in 2006 with subsequent declines.

**Table 9: Mathematics CST, 2004\*-2008, (% Advanced and Proficient)**

		School Year				
		2004*	2005	2006	2007	2008
Grade 6 General Math <sup>3</sup>	All students	44%	48%	52%	55%	59%
	Asian students	66%	70%	73%	75%	80%
	Hispanic students	20%	23%	29%	29%	34%
Grade 7 General Math <sup>4</sup>	All students	53%	51%	58%	44%	55%
	Asian students	65%	74%	81%	62%	65%
	Hispanic students	18%	25%	31%	39%	27%
Grade 8 General Math <sup>5</sup>	All students	12%	24%	25%	22%	21%
	Asian students	25%	50%	39%	42%	66%
	Hispanic students	8%	14%	20%	14%	17%
Grade 8 Algebra I <sup>6</sup>	All students	29%	59%	73%	69%	55%
	Asian students	47%	73%	82%	77%	72%
	Hispanic students	10%	27%	48%	50%	36%
Grade 9 Algebra I <sup>7</sup>	All students	53%	54%	60%	46%	49%
	Asian students	62%	65%	70%	56%	61%
	Hispanic students	31%	26%	34%	30%	31%

Source: California Department of Education

\* Alhambra City Elementary and Alhambra City High

Increases in the percentage of Advanced or Proficient students benefited students overall and the two primary ethnic groups (Asian and Hispanic) in AUSD. In general, Hispanic and Asian scores rose at the same rate (see Table 9 below) when calculated as the percentage of students scoring Advanced or Proficient. As a result, the achievement gap remains at the top levels of achievement. The exceptions to this rule centered on Grade 7

<sup>3</sup> N of test-takers=1247 in 2008, 1263 in 2007, 1279 in 2006, 1335 in 2005 and 1388 in 2004.

<sup>4</sup> N of test-takers= 926 in 2008, 1048 in 2007, 1358 in 2006, 1400 in 2005 and 1415 in 2004.

<sup>5</sup> N of test-takers= 346 in 2008, 446 in 2007, 532 in 2006, 554 in 2005 and 144 in 2004.

<sup>6</sup> N of test-takers= 744 in 2008, 678 in 2007, 667 in 2006, 774 in 2005 and 1138 in 2004.

<sup>7</sup> N of test-takers= 877 in 2008, 706 in 2007, 920 in 2006, 891 in 2005 and 869 in 2004.

Math (Hispanic scores increased 9% compared to 0% among Asians) and Grade 8 General Math (Asian scores increased 41% compared to 9% among Hispanic).

As shown in Table 10, CST scores in Mathematics have improved when examined as the proportion of students scoring Far Below Basic (FBB). Indeed, AUSD students are much less likely to score Far Below Basic in Math (7% fewer FBB in Grade 6, 6% fewer FBB in Grade 7, 5% fewer FBB in Grade 8 General Math, 13% fewer FBB in Grade 8 Algebra, and 15% fewer FBB in Grade 9 Algebra. Similarly, fewer students scored Below Basic (BB) in Grade 6 (-15%), Grade 7 (-10%), Grade 8 Algebra (-21%), and Grade 9 Algebra (-24%).

**Table 10: Mathematics CST, 2005-2008 (% Below Basic and Far Below Basic)**

		Below Basic				Far Below Basic			
		2005	2006	2007	2008	2005	2006	2007	2008
Grade 6 General Math <sup>8</sup>	All students	28%	26%	15%	13%	11%	11%	5%	4%
	Asian students	7%	7%	7%	5%	2%	1%	1%	1%
	Hispanic students	33%	29%	27%	22%	13%	10%	9%	7%
Grade 7 General Math <sup>9</sup>	All students	28%	26%	20%	18%	13%	12%	7%	7%
	Asian students	7%	4%	10%	9%	2%	1%	5%	2%
	Hispanic students	34%	27%	26%	25%	16%	11%	8%	11%
Grade 8 General Math <sup>10</sup>	All students	30%	31%	25%	36%	15%	15%	11%	10%
	Asian students	15%	17%	11%	28%	5%	8%	7%	4%
	Hispanic students	34%	30%	29%	38%	18%	17%	12%	10%
Grade 8 Algebra I <sup>11</sup>	All students	36%	31%	7%	15%	16%	16%	0%	3%
	Asian students	9%	4%	4%	9%	2%	1%	1%	2%
	Hispanic students	43%	18%	14%	22%	20%	3%	0%	5%
Grade 9 Algebra I <sup>12</sup>	All students	42%	39%	17%	18%	19%	24%	5%	4%
	Asian students	17%	6%	12%	11%	5%	2%	1%	2%
	Hispanic students	46%		26%	28%	24%	22%	6%	6%

Source: California Department of Education

### 8<sup>th</sup> Grade Math Enrollment

Table 11 below displays the proportion of 8<sup>th</sup> grade students tested in General Mathematics versus those tested in Algebra I. In 2003-04, AUSD disproportionately tested 8<sup>th</sup> graders in Algebra I. Indeed, AUSD was more than twice as likely to enroll/test 8<sup>th</sup> graders in Algebra I. In the 2004-05 school year, 8<sup>th</sup> grade placement shifted as AUSD implemented an Algebra Readiness course as an alternative to 8<sup>th</sup> grade Algebra. As a result, AUSD began to resemble the county-wide distribution with slightly more than half of the students tested in Algebra I. This trend continued, alongside a decline in the proportion of 8<sup>th</sup> graders tested in General Math. However, AUSD also enrolled many more students in 7<sup>th</sup> grade Algebra classes beginning in 2006-07. As a result, the decline in the number of 8<sup>th</sup>

<sup>8</sup> N of test-takers= 1247 in 2008, 1263 in 2007, 1279 in 2006, 1335 in 2005 and 1388 in 2004.

<sup>9</sup> N of test-takers= 926 in 2008, 1048 in 2007, 1358 in 2006, 1400 in 2005 and 1415 in 2004.

<sup>10</sup> N of test-takers= 346 in 2008, 446 in 2007, 532 in 2006, 556 in 2005 and 144 in 2004.

<sup>11</sup> N of test-takers= 744 in 2008, 678 in 2007, 667 in 2006, 774 in 2005 and 1138 in 2004.

<sup>12</sup> N of test-takers= 877 in 2008, 706 in 2007, 920 in 2006, 891 in 2005 and 869 in 2004.

graders tested in General Math is linked to an increase in the proportion of 8<sup>th</sup> graders tested in Geometry.

**Table 11: 8<sup>th</sup> Grade Mathematics Assignments 2004-2008**

	2004	2005	2006	2007	2008
AUSD 8 <sup>th</sup> Grade Students Tested in General Mathematics	144 (11%)	556 (46%)	532 (41%)	446 (32%)	346 (26%)
AUSD 8 <sup>th</sup> Grade Students Tested in Algebra I	1138 (89%)	667 (55%)	774 (59%)	678 (49%)	744 (56%)
Los Angeles County 8 <sup>th</sup> Grade Students Tested in General Mathematics	71,452 (52%)	54,759 (40%)	55,983 (43%)	57,099 (44%)	55,227 (42%)
Los Angeles County 8 <sup>th</sup> Grade Students Tested in Algebra I	55,030 (40%)	72,360 (53%)	65,178 (50%)	64,999 (50%)	66,804 (51%)

Source: California Department of Education

### Trimester Assessments

Beginning in 2006-07, AUSD required schools to administer district-developed benchmark assessments in Mathematics. These formative data are collected on a trimester basis. In Table 12 below, we present 2007-08 trimester assessment data for 8<sup>th</sup> grade students enrolled in the *Introduction to Algebra* course taught by CaMSP teachers (AIM), in comparison to those students taught by teachers uninvolved in the AIM program (Non-AIM). In most cases, students taught by AIM teachers did slightly better on district trimester assessments. The gap between AIM and Non-AIM was greatest in standards related to Number Sense (particularly standards targeting Rational Numbers). In addition, students taught by AIM teachers did better on all standards measuring math reasoning, a key feature of CaMSP related training and professional development.

**Table 12: 8<sup>th</sup> Grade *Introduction to Algebra* by Trimester, 2007-08 (Mean % Correct)**

8 <sup>th</sup> Grade General Math Standards	Trimester 1		Trimester 2		Trimester 3	
	AIM (N=175)	Non-AIM (N=119)	AIM (N=151)	Non-AIM (N=136)	AIM (N=133)	Non-AIM (N=144)
Number Sense	68%	63%	59%	57%	52%	43%
Algebra and Functions	50%	49%	52%	44%	45%	40%
Geometry	n.a.	n.a.	46%	42%	42%	41%
Reasoning	66%	60%	32%	21%	28%	22%
Algebra I	n.a.	n.a.	n.a.	n.a.	50%	47%

Source: AUSD

Table 13 below presents 2007-08 trimester assessment data for 8<sup>th</sup> grade students enrolled in Algebra I, comparing students taught by CaMSP teachers (AIM), in comparison to those students taught by teachers uninvolved in the AIM program (Non-AIM). As shown below, there were very few differences in the trimester assessment results comparing students taught by AIM and Non-AIM teachers. The one exception occurred in the third trimester where students taught by Non-AIM teachers did markedly better on the district assessment in Algebra I.

**Table 13: 8<sup>th</sup> Grade *Algebra I* by Trimester, 2007-08 (Mean % Correct)**

Algebra I Standards	Trimester 1		Trimester 2		Trimester 3	
	AIM (N=330)	Non-AIM (N=309)	AIM (N=430)	Non-AIM (N=506)	AIM (N=475)	Non-AIM (N=305)

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Number Sense	n.a.	n.a	81%	82%	n.a.	n.a.
Algebra and Functions	n.a.	n.a.	66%	68%	n.a.	n.a.
Algebra I	50%	51%	51%	50%	54%	78%

Source: AUSD

## IV. Assessment of Project Goals

This section of the report summarizes the accomplishments of the AIM project in terms of the goals and objectives written into the original CaMSP grant and Mid-Course Performance Review renewal grant.

**Goal 1: A total of 25 teachers in Cadre I will meet the 208-hour requirement for intensive training and follow-up.**

- **Status:** The average Cadre I AIM teacher participated in 358 hours of training and follow-up, greatly exceeding the State requirement for 208 hours. Out of a target of 30 original (Cadre I) teachers, AUSD successfully involved 23 teachers in 208 or more hours of combined intensive professional development and follow-up; 3 additional teachers completed 160+ hours of training.

**Goal 2: A total of 15 teachers in Cadre II will meet the 104-hour requirement for intensive training and follow-up.**

- **Status:** In Cadre II, 10 of the 15 targeted teachers met the goal of 104 hours of intensive training and follow-up with 2 additional teachers narrowly missing the goal.

**Goal: Ten multi-subject credentialed teachers will earn Subject Matter Authorization in Mathematics.**

- **Status:** Six AUSD teachers successfully earned the credits necessary for this distinction as part of the AIM project; two additional teachers are at filing status for subject matter authorization in Mathematics.

**Goal: AUSD teachers participating in AIM will demonstrate increased content knowledge of Mathematics through a written assessment**

- **Status:** The average Cadre I AIM teacher participant increased his/her content knowledge in Mathematics by 13% comparing pre- and post-test results on the Learning for Mathematics and Teaching (LMT) survey. Increases in content knowledge occurred in all three domains of the test. Among Cadre II AIM participants, gains were less pronounced (1% increase) with gains isolated to test items concerned with Algebra & Functions.

**Goal: Increase the percentage of 6<sup>th</sup> – 8<sup>th</sup> grade students scoring Advanced or Proficient on the General Mathematics CST by 10%**

- **Status:** Comparing General Math CST scores from 2004 to those of 2008, the raw percentage of students scoring Advanced or Proficient increased 15% in 6<sup>th</sup> grade, 2% in 7<sup>th</sup> grade, and 9% among 8<sup>th</sup> graders not enrolled in Algebra. Expressed as a *rate* of improvement, AUSD met its goals for improving student performance by at least 10% on the General Mathematics CST for all but 7<sup>th</sup> grade.



**Goal: Increase the percentage of 8<sup>th</sup> grade students scoring Advanced on the Algebra CST by 20%**

- **Status:** Comparing General Math CST scores from 2004 to those of 2008, 26% more 8<sup>th</sup> graders scored Advanced or Proficient on the 8<sup>th</sup> grade Algebra I CST.

**Goal: Reduce the achievement gap in Mathematics by improving the scores of Hispanic middle school students.**

- **Status:** Hispanic scores improved in terms of an increased percentage of students scoring Advanced or Proficient, but gains tended to match those of Asian students resulting in little closing of the achievement gap. In 2008, the proportion of Asian students scoring Advanced or Proficient in Mathematics was 36%-49% higher compared to Hispanic students. However, the proportion of Hispanic students scoring at the lowest proficiency levels (Far Below Basic or Below Basic) declined 14%-36% during the same time period resulting in a modest narrowing of the achievement gap.