FOUR YEARS OF CALIFORNIA MATHEMATICS PROGRESS

September 1, 2002

The California Mathematics Standards were approved in late 1997 and statewide SAT-9 testing with online school scores began that same academic year. This fortunate situation has produced some of the most powerful evidence available that the "constructivist" approach of the previous decades, culminating in the 1992 California Mathematics Framework and subsequent curricular approval of 1994, was a misguided failure. Other changes have been made that contribute to the progress as well. Primary instruction in Spanish, with little attention to English, has been dramatically reduced, although far from eliminated, since the passage of Proposition 227 in 1998, and a much reduced class size in the early grades was implemented at roughly the same time. The latter may vanish with state budget contingencies but, until then, this must be considered somewhat of an unknown factor.

Unfortunately, the state does not have an associated reporting of the primary curricula, if any, that schools use for various disciplines making associations between curricula and student performance somewhat serendipitous but not completely without evidence. Azusa Unified was noted in the Richard Lee Colvin story in the LA Times in regard to the 2001 progress, Baldwin Park in another by Martha Groves, also of the LA Times, at the same time. Cragmont school in the Berkeley district was pointed out in a SF Chronicle story by Nanette Asimov in 2000 because it had one of the highest API increases in the Bay Area. Annandale of LAUSD was mentioned in an LA Times editorial for the same reason in the LA area. Ninth Street Elementary was, in a very real sense, the home of Prop 227 and, a couple years after Prop 227 went into effect, it showed up in a nay-saying post by a popular and nationally known education professor under the title "What Happened at 9th Street Elementary?" So I looked. Etcetera. I have been following these schools and districts as I became aware of them. It would be powerful evidence if decision makers could search the state's student performance database by selecting demographic ranges similar to those in which they were interested together with primary mathematics curriculum used, if any, to try to see what appears to be most effective in their local situations but that is not yet possible. Still, there is evidence about specific curricula that decision makers should not ignore.

Beyond specific curricula, however, the overall state trend has been and continues to be impressive. Both reading and mathematics have been going up in the four years since the data has been available but mathematics considerably more so. Even LAUSD, with an overt effort to delay getting with the state's curricular changes has been making substantial progress. Some districts and schools that made overt efforts to get with the program have made stunning progress. The increase is probably topping out at the early grades in some of these schools and it will take years for it to move up through the middle school grades and on through high school but great progress is already clear to those not wearing anti-testing blinders. Regrettably, there are too many such people in positions of education leadership but the climate is much different and much more hopeful than a half decade ago; progress is palpable all across the state.

The SAT-9 scores mean less and less at the upper grades; students with real options are in algebra and beyond instead of working at getting better and better at the pre-algebra mathematics tested by the SAT-9. Moreover, California does not have a textbook approval process beyond Grade 8 but, for completeness, here are all grades for the state for California and for LA Unified. There is another problem with senior high scores, the huge dropout factor tends to skew the results upward. For example, there were 40% fewer 11th grade students tested in LAUSD in 2002 than 9th grade students in 2000. Not all would be at the bottom end academically - in fact, one or two may be at my own campus as early enrollment college students - but the average distortion tends to push the average upward. The rest of the school data is more closely tied to the California Mathematics Content Standards, the 1999 Mathematics Framework that incorporates them, and consistent curricula. Some are K-5 and others K-6, depending on the district's division between elementary and middle schools. The current year,

2002 data, is the first that reflects the 2001 state curricular approvals, with more choices available, but data from 2000 onward reflect the 1999 approvals in those districts that elected to implement approved curricula in Fall 1999.

Although transfers in and out affect some schools quite dramatically, following cohorts of students through years of school is illustrative; that is, diagonally down from left to right in each chart. The data is fairly convincing that, if statistical progress is to be seen, it should start early. Very early. My guess is that this consistent pattern would extend down to first grade, even to kindergarten, but California does not report the data until second grade. The foundation set in the first few years appears to be critical.

California SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	43	50	57	59	63
3	42	49	57	61	64
4	39	44	51	54	58
5	41	45	51	55	58
6	48	52	57	60	62
7	45	47	51	53	54
8	45	48	50	51	52
9	50	51	54	54	54
10	43	45	47	47	48
11	46	48	50	50	50

Los Angeles USD SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	32	36	41	44	53
3	30	35	42	49	54
4	27	30	35	39	47
5	28	31	35	39	44
6	30	34	37	39	42
7	29	32	33	34	35
8	30	33	34	34	35
9	37	38	39	39	39
10	33	36	36	36	37
11	37	41	41	41	43

As mentioned above, Azusa's mathematics performance made the LA Times last year, Richard Lee Colvin's special insert "Report Card" of August 16, 2001, "two-thirds of the students are from low-income households and half are not native English speakers. But math scores there have been surging in recent years and about half the students in grades two through six are now above the national average." This year's are higher. Curriculum helps. Azusa and Sacramento City adopted Saxon Math for the 1999-2000 year, a decision that helped continue the progress already made by abandoning their previous and constructivist curriculum, MathLand.

Azusa USD SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	32	46	46	51	52
3	28	37	49	52	53
4	26	32	40	49	51
5	29	34	46	50	54
6	30	37	42	48	57

Sacramento City USD SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	30	46	55	57	57
3	30	47	56	60	59
4	32	39	50	57	58
5	34	43	49	55	64
6	43	53	61	64	54

Another district, two really, that have caught public attention are the districts of Baldwin Park, famous for being the home of Serrano v. Priest, aka the Serrano Decision, that led to equalization of funding across LA County. Baldwin Park was the “have-not” district, my own Pasadena was the “middler”, and Beverly Hills was the “we’ve got it all” district in court testimony, with predictable student performance numbers that were consistent with the expenditure discrepancies. This district also adopted the AB-2519 approved Saxon Mathematics program along with the rest of the city of Baldwin Park, a portion of it carved out as the Bassett district that was mentioned in Martha Grove's article in the LA Times on August 20, 2001 as an example of a district that has shown strong success with direct instruction.

Baldwin Park USD SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	19	30	43	48	57
3	22	29	49	53	59
4	23	24	36	45	50
5	25	29	34	46	51
6	38	42	48	52	59

Bassett USD SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	24	43	42	54	55
3	27	39	48	54	57
4	25	32	42	51	55
5	25	34	35	55	53
6	31	40	45	47	57

That is, to get Baldwin Park mathematics up to national averages, funding didn't help over 30 years but adopting Saxon Math, and direct instruction more generally, did.

Cragmont Elementary of Berkeley Unified was featured in a SF Chronicle article on October 5, 2000, because it had one of the greatest API increases in the state. Nanette Asimov’s article indicated that it had adopted Saxon Math and a look at the scores indicates that, the mathematics progress was more striking than reading progress over that two-year period, especially the second year with its new math curriculum. The scores since show some progress but may have maxed out; I have not checked to see if they are still using the same curriculum.

Cragmont El. SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	40	54	61	56	66
3	28	44	74	78	65
4	49	35	61	67	57
5	*	35	53	58	62

I also mentioned that Annandale Elementary in LAUSD was singled out that year in an LA Times editorial for the same reason, exceptionally high API increase. It was one of the LAUSD pilots of Saxon Math and progress continued in 2001. This past year, Annandale was told to replace its Saxon curriculum with the district mathematics adoption. Though excellent, these scores have stagnated, perhaps due to this curricular change.

Annandale El. SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	33	49	50	57	62
3	28	42	62	71	63
4	22	27	48	65	57
5	23	28	47	62	62

Ninth Street Elementary is interesting from its Prop 227 history; that was the school that caught Ron Unz's attention when its parents, low-SES Hispanic, many illegal, chose to take their children and walk out in protest of the fact that school was being conducted almost entirely in Spanish with very poor academic performance levels, not at all what they sought for their children. It also has picked up Saxon Mathematics. There is considerable evidence that the associated constructivism and so-called "progressive education", more generally, had more to do with poor performance than the absence of English language instruction; mathematics is international. Be that as it may, the improvement has been remarkable.

Ninth St El SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	17	35	29	34	47
3	50*	27	39	52	54
4	30	30	46	60	66
5	21	35	43	43	56

* This 50 seems out of place but the fact that only 44 third grade students were tested in 1998 versus 72 in 2002 probably has much to do with it. The school began using Saxon Math with the 2000-2001 year. How are these students doing reading in English? That 66 in 4th grade is much higher than reading, of course; it is only 42 in reading. Bad? The 42 was based on 77 students in 2002 versus an average NPR of 20 on 50 students in 1998. It is now 4 points above the LAUSD average for 4th grade and only 8 off of the state and national average of 50. Their walk-out seems to be paying off.

Another low-SES, high minority LAUSD school that has been pointed out to me, again because of its involvement with Saxon Math and student performance increases, is Eshelman Avenue Elementary. Its SES numbers are not as discouraging as those of Ninth Street but still nearly three-quarters of the students qualify for meal assistance; the school is more than 50% Hispanic, with something of the order of 20% considered to be English language deficient, and another 15% black. Given those demographics, performance was not bad comparatively four years ago but progress since is stunning.

Eshelman Ave El SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	39	39	48	57	71
3	48	52	61	66	74
4	27	52	50	61	67
5	41	25	48	44	62

Another low-SES, high minority district is Inglewood Unified. A couple of its schools have received special recognition for strong performance, a fact that led to one former principal, Nancy Ichinaga, being appointed to the State Board of Education. As other schools began to follow the leadership of Kelso and Bennett-Kew, the district scores rose appreciably. Three of the top four elementary schools in the district adopted Saxon Mathematics, with scores reflected in the 2000 and 2001 data, but the district mandated its replacement for the 2001-2002 year.

Inglewood USD SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	50	64	72	75	73
3	47	60	66	74	71
4	37	48	53	57	56
5	43	48	50	54	58

Finally, the schools represented above are all on the low end of SES demographics, some having almost all students who qualify for meal assistance and a high percentage of underrepresented minority populations. Some schools with very different numbers, and a history of comparatively strong performance, are also indicating how far short of potential student achievement had been. One district that has been pointed out to me as exemplary in this regard is Manhattan Beach Unified, another Saxon Math district, as of the 2000-2001 school year in early grades and all grades in 2001-2002. In this district, less than 5% qualify for lunch assistance, more than half the parents are college graduates, most of the teachers hold full credentials, etc. Student performance is approaching astronomical:

Manhattan Beach USD SAT-9 Math Ave NPR

Grade	1998	1999	2000	2001	2002
2	74	82	89	93	92
3	79	81	87	92	93
4	81	82	82	87	92
5	83	85	88	87	92

The state is moving more and more toward emphasizing its California Standards Exams that are closely tied to the state's standards rather than to national norms as is the SAT-9. Although this offers advantages, it also offers the disadvantage of not yet being able to track school progress over time. For example, the reporting of this year's Standards Exams is different from last year and that was different from the year before that, the first year of any data at all. Still, those numbers are meaningful, often indicating a deeper level of mathematical sophistication than the SAT-9 or other off-the-shelf, nationally-normed exams. How are the students in these schools doing? Not surprisingly, there is a strong correlation between good performance in one and the other. These Manhattan Beach kids are superb, an amazing 0% deemed "Far Below Basic" in the districts five elementary schools and only 4% or less "Below Basic"; 40-50% are "Advanced", the state's highest category.

Once again, the state is collecting overwhelming evidence of how to improve student mathematics conceptual understanding and performance. The harder task is making sure that a program proven to be successful is available to every student from kindergarten forward.

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