



## The Preuss School at UCSD: Academic Performance of the Class of 2009

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## Executive Summary

This report presents information on the academic performance of students who graduated from the Preuss School in 2009 and comparison group students who applied to the school in 2001, but did not “win” acceptance to the school via a random lottery. Preuss students and comparison group students are compared on the standardized tests they took when they initially applied to the school, while in middle and high school, as well as their high school grade point averages, A-G course completion rates and high school exit exams. Because we were unable to obtain information about the comparison group’s SAT scores, AP course completion rates and college-going information, only information about the Preuss School Class of 2009 is reported for these indicators.<sup>1</sup>

When the initial applicant pool to the Class of 2009 was split by the lottery into the Preuss and comparison groups, a concern is that the “luck of the draw” may concentrate academically talented students into one group relative to the other. A statistical analysis of pre-lottery standardized test performance suggests that for the Class of 2009, the “luck of the draw” favored Preuss students, who have higher baseline test scores than the Comparison group. This clouds the analysis because differences between the groups emerging over time may be due to either baseline differences in academic talent, subsequent school effects, or a combination of the two influences. Major group differences on important academic indicators appear in the following areas:

- There were significant differences between the groups, over time, on standardized tests taken in grades 6-12; although these differences may be due to significant baseline differences in the distribution of academic talent in the Preuss and Comparison groups.
- Preuss students completed the courses required for admission to public colleges and universities at a much higher rate than students in the comparison group.
- Preuss students had significantly higher cumulative grade point averages than comparison group students. The approximately one half grade point difference in the cumulative weighted grade point average was large enough to impact college eligibility and the competitive standing of college applications.
- 83% of Preuss graduates filed a “Statement of Intent to Register” with the University of California, the California State University, or private four-year institutions. Of the remaining 17%, the majority continued their education at a community college and entered into a guaranteed transfer agreement, allowing for eventual transfer to either the UC or CSU systems.

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<sup>1</sup> Publicly available data was the primary source for information on comparison group performance. While useful, these resources are not exhaustive and information on all desired performance indicators was not available for the desired time period. Because of this, there are unavoidable gaps in the comparisons between Preuss and the comparison group. CREATE wishes to thank the San Diego Unified School District and the Preuss School for providing the data used for some of the calculations.

## Section 1: School Characteristics and Issues in the Analysis

The Preuss School is a grade 6-12 charter school located on the campus of the University of California, San Diego. It was founded to expand educational opportunity for students from low-income households. The School offers all students a rigorous academic curriculum supported by a differentiated system of academic and social supports, including a longer school day, a longer school year, intensive tutoring, mentoring, counseling, and parent education opportunities. In the spring of 1999, the Preuss School accepted applications to fill spaces in grades 6, 7, and 8 for its first year of operation in the 1999/2000 academic year. Seven years later, the Preuss School reached its maximum enrollment of approximately 800 students. It is anticipated that future intake to the school will occur primarily in the 6<sup>th</sup> grade, with about 125 students accepted each year.

Tables 1.1 through 1.3 show 2008/2009 enrollment by grade level, the Race/Ethnicity of students, and the average class size in selected subject areas. Teachers at the Preuss School have a slightly higher average class size relative to the San Diego Unified School district, 25.9 versus 23.9, respectively. Of the 42 teachers at the school, three were not fully credentialed.

**Table 1.1 Enrollment by Grade – 2008/2009 Academic Year**

<i>Grade</i>	<i>Enrollment</i>
<b>Grade 6</b>	114
<b>Grade 7</b>	111
<b>Grade 8</b>	112
<b>Grade 9</b>	108
<b>Grade 10</b>	112
<b>Grade 11</b>	102
<b>Grade 12</b>	96
<b>Total</b>	755
<i>Source: California Department of Education, Educational Demographics Office (<a href="http://data1.cde.ca.gov/dataquest/">http://data1.cde.ca.gov/dataquest/</a>)</i>	

**Table 1.2 Enrollment Race/Ethnicity 2008/2009 Academic Year**

	<i>SCHOOL</i>		<i>DISTRICT</i>
	<i>Enrollment</i>	<i>Percent of Total</i>	<i>Percent of Total</i>
<b>American Indian</b>	1	0.1%	0.5%
<b>Asian</b>	142	18.8%	8.9%
<b>Pacific Islander</b>	2	0.3%	1.0%
<b>Filipino</b>	16	2.1%	6.6%
<b>Hispanic</b>	469	62.1%	44.4%
<b>African American</b>	88	11.7%	13.2%
<b>White</b>	37	4.9%	25.3%
<b>Multiple/No Response</b>	0	0.0%	0.0%
<b>Total</b>	755	<b>100%</b>	<b>100%</b>
<i>Source: California Department of Education, Educational Demographics Office (<a href="http://data1.cde.ca.gov/dataquest/">http://data1.cde.ca.gov/dataquest/</a>)</i>			

**Table 1.3 Average Class Size 2008/2009 Academic Year**

	<i>School</i>		<i>District</i>
	<i>Number of Classes</i>	<i>Average Class Size</i>	<i>Average Class Size</i>
<b>School wide</b>	195	25.9	23.9
<b>English</b>	32	26.1	23.3
<b>Math</b>	35	21.9	24.8
<b>Social Science</b>	16	28.1	26.6
<b>Science</b>	39	27.2	27.4

*Source: California Department of Education, Educational Demographics Office*

The Preuss School admits only students who qualify for federal meal assistance at the time of application and whose parents or guardians have not graduated from a four-year college. In addition, the School seeks students who show academic promise but who may not have lived up to their full potential. Admission to the school follows a two step process: screening and selection by lottery. In the screening step, several readers score each completed application and identify students/families meeting the demographic criteria and demonstrating academic potential<sup>2</sup>. If space is available, all students are admitted to the school. If the number of screened applicants exceeds the spaces available, a lottery is held and the results of that random drawing determine which students receive an offer of admission to the school. Students who are unsuccessful in the lottery are placed on a waitlist and these students are admitted to the School if and when space becomes available. Members of the Preuss Board have told us that the number of applicants to the school has increased in recent years and that the school now holds an annual lottery for admission to 6<sup>th</sup> grade.

Because the lottery splits the applicant pool into two demographically matched groups, accepted and wait-listed students, we may follow the progress of students over time in a quasi-experimental fashion and determine if (and how) the groups differ on several academic indicators.<sup>3</sup> Here we report and compare the performance of the Preuss and comparison groups statistically across four sets of academic indicators: standardized tests, unweighted and weighted GPA, progress toward (or completion) of A-G admission requirements and the California High School Exit Exam.

Possible Issues in the Analysis:

Before we could have confidence that the results we report were based on a fair and transparent treatment of the data, several issues needed to be addressed. We examined the data extensively and three issues were of particular concern because they could work against an isolation of school effect, or require the application of different statistical methods. The three areas of concern were:

2 It is our understanding, from discussions with personnel at the Preuss School, that the criteria used to determine “academic potential” was not restrictive. Applicants were not required to demonstrate high academic achievement, only potential, defined as performance at or above the 50th percentile on one subtest of the Stanford 9 (or the current State mandated standardized test). Students lacking a single subtest above the 50th percentile were also admitted if they had strong letters of support from teachers or personal statements that indicated academic potential.

3 We are grateful to the San Diego Unified School District, which has generously granted access to academic data for the students in the comparison group, allowing us to perform the analyses presented. Only students in the comparison group who attended one of the San Diego City Schools are included in this report.

1. Pre-Lottery Standardized Test Performance. Did the Preuss and Comparison students start out at similar levels? This is important because “luck of the draw” in a single lottery drawing could result in an uneven distribution of academic talent in the resulting groups.
2. Attrition. Was there a difference in the number of students leaving the Preuss or comparison group, over time, and were the students who left the groups substantially different from those who started with the group? We wanted to know if attrition, rather than learning and school characteristics, could be influencing our analyses.
3. Access to student records. If we are unable to gain access to the academic records of some students, at what point does this work against a fair assessment of the academic achievement of the two groups?

1) Pre-lottery standardized test performance:

Any time that a single lottery is used to separate a pool of students into two groups it can result in an unequal distribution of attributes, for example, more girls in one group than the other. Because of the Preuss entrance requirements, all students/parents entered into the lottery meet specific income and education criteria, and it is likely that all applicants possessed a high motivation to achieve academically. For these reasons, the lottery would have no effect on the distribution of these important demographic characteristics; each group received students with matching demographic and motivational characteristics. However, the lottery did not guarantee that Preuss and comparison groups would receive students with equal academic prowess. Simple “luck of the draw,” might have resulted in more students with high (or low) achievement concentrated in either the Preuss or comparison group. Because of this concern, we examined the “pre-lottery” academic performance of the students in the two groups to determine if differences existed and if those differences were statistically and practically important.

We chose to use standardized test scores as the measure to determine if the two groups started out with similar academic characteristics. The choice was not made because of the innate superiority of standardized test scores as a measure, but for the simple reason that there was no other set of objective measures consistently available across school sites. We deliberately chose not to use academic marks (i.e., GPA) as a baseline indicator because standards (and marks) vary from school to school for reasons other than academic performance; this is especially true in elementary school grades K-6, where a narrative or other type of progress indicator is often used instead of GPA. When the pre-lottery standardized test performance for Preuss and comparison groups is statistically indistinguishable (by convention, an observed  $p$ -value greater than 0.05), it is important to remember that being able to say that there was “no statistically significant difference” is not the same as saying that we are positive that no academic differences existed between the groups. Also, had other measures of academic achievement been available, those measures might have demonstrated group differences. The best claim that can be made is that available evidence did not support a claim of academic difference between the groups, for the measures used.

To determine if the pre-lottery performance of the Preuss and Comparison groups within a graduating class was different, we compared scaled scores from tests administered in the spring of the application year.<sup>4</sup> Table 1.1.1 shows the group performance on the

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<sup>4</sup> Scaled scores are raw test scores which have been adjusted to account for content differences in versions of a standardized test. They allow for an “apples to apples” comparison of test performance. “Raw scores identify the number of items answered correctly on a test or sub-test. Raw scores are limited in their measurement precision because of differences among test items. For example, some items are more difficult than others. A scaled score

standardized tests (significant observed *p*-values are noted with an asterisk) for the Class of 2009. On average, Preuss students scored higher than Comparison group students on all four subject tests, and this difference is significant for three of these areas (Language Arts, Mathematics and Reading). The largest scale score difference is for the Language Arts subject tests, in which the average scale score of Preuss students is 20 points higher than the average scale score of Comparison group students, and this difference is highly significant. The average scale score difference is also large for Mathematics and Reading, at 17 and 16 points, respectively.

In practical terms these results tell us that, based on these measures, there is evidence suggesting a statistically significant initial difference in the distribution of academic talent in the Preuss and Comparison groups. This baseline difference should be kept in mind when examining future test score differences between Preuss and Comparison group students – significantly higher performance by Preuss students may be due to this uneven initial distribution of talent, rather than school effects.

A potential solution to this issue would be to adjust test scores to account for this initial difference, and examine whether any additional differences in test scores emerge over the years. However, such an adjustment would only remedy an initial difference in the level of test scores. Initial differences in the rate at which students learn, or the speed at which this rate changes, would persist. Thus, we choose not to make such an adjustment, as it will not rigorously address the problem.

It is also interesting to note that both Preuss and comparison group students scored considerably higher than the district average scale score for economically disadvantaged students in all four subject areas of the 5<sup>th</sup> grade SAT9.

**Table 1.1.1 Class of 2009 - Pre-Lottery Standardized Test Results**

<i>TEST SUBJECT AREA (YEAR TAKEN)</i>	<i>PREUSS AVG SCALE SCORE</i>	<i>COMP. AVG SCALE SCORE</i>	<i>DIFF- ERENCE</i>	<i>P- VALUE</i>	<i>DISTRICT AVG SCALE SCORE*</i>
SAT9 Language Arts 5 <sup>th</sup> (2002)	679 (N=82)	659 (N=38)	20	<0.001*	634
SAT9 Mathematics 5 <sup>th</sup> (2002)	685 (N=82)	668 (N=38)	17	0.008*	640
SAT9 Reading 5 <sup>th</sup> (2002)	684 (N=82)	668 (N=38)	16	0.006*	639
SAT9 Spelling 5 <sup>th</sup> (2002)	672 (N=82)	662 (N=38)	10	0.189	633
*For economically disadvantaged students					
<b>Source:</b> SDUSD data; California Department of Education ( <a href="http://star.cde.ca.gov/star2002/Reports.html">http://star.cde.ca.gov/star2002/Reports.html</a> )					

2) Effect of attrition:

Our second concern was that the Preuss and comparison groups might have experienced different rates of student loss over time and that, even if both groups lost the same percentage of students, the students who left one group may have been qualitatively different from the students that left the other group. For example, if the Preuss group lost only high-performing students while the comparison group lost a representative group of students, an unequal and unfair comparison would be created between the two groups. A Preuss loss of only high-performing students may have resulted in lower average academic

takes item differences into account and is calculated to provide a more precise measure of the knowledge or skills tested. Through this calculation, an increase of one point at one place on the scale is described as being equal to a one- point increase anywhere else on the scale. Scaled scores are particularly useful for reporting changes over time” (California Department of Education).

performance scores for Preuss, relative to what they would have been without such attrition. The comparison group would not have experienced this, thus the unfair comparison. Concentration of high or low performing students in a group due solely to attrition would affect the average performance of a group for reasons unconnected to student knowledge or school effects.

To test for this we computed the average pre-lottery test score of all the initial members of the Preuss group and then computed the average pre-lottery test score for all students who remained in the group at the end of the 2008/2009 academic year (Final Group). The process was repeated on the comparison group. Table 1.1.2 shows the results of those calculations. To determine the net effect of attrition, the final column was calculated: (Preuss Final Members - Preuss Initial Members) - (Comparison Final Members - Comparison Initial members). A positive number (expressed in scale score points) means that attrition tended to raise the test scores of the final Preuss group relative to the comparison group, while a negative number means the opposite, that attrition tended to raise the test scores of the final comparison group relative to the Preuss group.

For the Class of 2009 the effect of attrition was moderate and in favor of the Press group. Preuss students who left the school tended to have slightly lower test scores than those who remained, while Comparison group students who left the district tended to have slightly higher test scores than those who remained in Language Arts, Reading and Spelling, and slightly lower scores than those who remained in Mathematics. Therefore, attrition is responsible for part of the test score differences between Preuss and Comparison group students. In particular, attrition is the cause of half of the initial test score difference for Language Arts, a third of the initial difference for Mathematics, two thirds for Reading and the entire difference for Spelling.

This result argues that attrition introduced a systematic bias favoring the Preuss group. In practical terms this means that differences observed between the groups may be due, at least in part, to attrition rather than student learning or school effects.

**Table 1.1.2 Class of 2009 Pre-Lottery Test Scores: Effect of Attrition**

<b>TEST SUBJECT AREA (YEAR TAKEN)</b>	<b>PREUSS (FINAL)</b>	<b>PREUSS (INITIAL)</b>	<b>COMP. (FINAL)</b>	<b>COMP. (INITIAL)</b>	<b>EFFECT</b>
SAT9 Language Arts 5 <sup>th</sup> (2002)	679 (N=82)	673 (N=137)	659 (N=38)	662 (N=53)	9
SAT9 Mathematics 5 <sup>th</sup> (2002)	685 (N=82)	677 (N=137)	668 (N=38)	665 (N=53)	5
SAT9 Reading 5 <sup>th</sup> (2002)	684 (N=82)	676 (N=137)	668 (N=38)	671 (N=53)	11
SAT9 Spelling 5 <sup>th</sup> (2002)	672 (N=82)	665 (N=137)	662 (N=38)	666 (N=53)	11
<i>Source: SDUSD data</i>					

3) Effect of data availability:

We currently have access to student level data from the San Diego Unified School District (SDUSD) and while this access is invaluable, we are concerned that future applicant pools may draw an increasing number of students from outside SDUSD, and that this increase may impact our ability to track students in the comparison groups.

As more students from outside SDUSD apply to Preuss, it naturally follows that these students will have greater representation in the post-lottery comparison groups. It is projected that future lotteries will be held for entry into the 6<sup>th</sup> grade; so it is likely that

unsuccessful lottery participants from schools outside SDUSD will elect to complete elementary school (grades K-6) at their current school, rather than emigrate to a SDUSD elementary school. This could result in an immediate “loss” of comparison group student level data as it is unlikely that we will have immediate access to data from those school districts. For the class of 2009, 5 out of the 56 students waitlisted during the lottery were out of district or private school students. Thus, roughly 9% of the comparison group was immediately lost to attrition. Given the difficulty of negotiating data sharing agreements with multiple districts, and the small marginal gain of obtaining a few additional students per agreement, it would be difficult to remedy this issue by obtaining additional data on a district by district basis.

A second issue has to do with students in the comparison group leaving SDUSD schools. Students not returning to their school in the following term (or academic year) are not required to report the transfer to their current school or provide information on the new school they plan to attend. This is problematic because we will not be able to determine where (or if) students are continuing their education. Even if this knowledge were consistently reported and readily available, it is a strong assumption is that the school districts that receive those students would be receptive to a data sharing agreement allowing the release of student level data required for analyses. Complicating this issue further are the subset of students who drop out of high school, do not take tests and are not tracked by any school district; these students are lost for analysis purposes.

We are working with the Preuss School to address these potentially serious problems by modifying the application to the school so that parental consent is obtained for the release of contact information (home and cell phone, home address) as well as access to current and future academic records. While we will attempt to negotiate data sharing agreements with additional school districts as the need arises, from a practical standpoint the logistics work against this approach. Even if the negotiation and procurement of data sharing agreements were not extremely labor intensive, data availability will remain a potentially serious problem.

## Section 2: Issues Surrounding Standardized Test Performance

In this section and the section that follows, we examine the standardized tests taken by the Class of 2009 from 6<sup>th</sup> grade through graduation. Over the past several years, the State of California has repeatedly changed the standardized test used to assess student performance and, because of these changes, the results of three different tests are reported: the Stanford Achievement Test, Version 9 (SAT-9), California Achievement Test, Version 6 (CAT-6) and the California Standards Test (CST).

Both the SAT-9 and CAT-6 tested students using several examinations and each year students took examinations that were grade and subject specific (e.g., 9<sup>th</sup> grade English). The examinations were “vertically integrated”, that is, constructed so that test results within a subject area could be directly compared from one year to the next. For example, knowledge demonstrated on the Language Arts SAT-9 (or CAT-6) could be statistically assessed by comparing the year over year scaled scores earned by students on that examination.<sup>5</sup> Both the SAT-9 and CAT-6 examinations were replaced by the CST in the 2002-2003 school year. While some CST subject tests are tied to specific grade levels and taken by all students (e.g., English and History), Mathematics and Science examinations are linked only to the courses taken by students and are independent of grade level. For example, there is no longer a 9<sup>th</sup> grade Mathematics examination; students taking Algebra I in the 8<sup>th</sup> or 9<sup>th</sup> grades would both take the same CST Algebra I examination. The CST is not vertically integrated and because of this the scores from one year cannot be compared to test results from other years.

For the purposes of this report, there were two unintended consequences associated with the introduction of the CST—smaller groups available for statistical analysis and differences in the courses (and tests) taken by students in the two groups. Table 2.1 provides information on which CST examinations were taken in each of the testing years. It is clear that the Preuss and comparison groups took the English and History examinations (World History and U.S. History) during the same years, but that there were some differences in the Sciences tests and pronounced differences in the Mathematics tests taken by the groups. In 2006, 12.6% of Preuss students took the higher level Algebra 2 examination while only 2.6% of the comparison group took that exam.

A pattern of proportionately more Preuss students taking higher level Mathematics courses persists across testing years and subject areas. These differences may have introduced bias into the results reported, specifically, a bias favoring the comparison group. Using the 2005 Algebra 1 examination as an example, observe that 14.9% of Preuss students took the higher level Geometry exam in 2005. A reasonable interpretation is that the higher achieving Preuss students took Geometry, while Preuss students who took Algebra 1 were mainly lower achieving and unprepared to take Geometry. Meanwhile, no comparison group students took Geometry in 2005 – comparison group students took either Algebra 1 or general 8<sup>th</sup> grade math. As a result, the reported exam results compare, more or less, the bottom three quarters of Preuss students with all comparison group students. This would tend to favor the comparison group students purely because of these selection effects.

The second issue was small group size. When the number of students taking a CST examination did not exceed 8-10, it is likely that any kind of statistical test would lack “power” – the ability to detect group differences, if they existed. Below this numeric threshold, the results of a statistical test are not reported as there was not a reasonable expectation that the tests performed were capable of detecting “true” group differences.

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<sup>5</sup> Although the CAT-6 was largely constructed with questions from the SAT-9, it is sufficiently different that student performance on the two tests cannot be compared.

Looking again at table 2.1, the sample size for the 2005 Algebra 2 and 2007 Biology examinations were so small that the results of those exams could not be reported. Testing in the later school years had similar problems with small sample sizes in a variety of subject areas.

**Table 2.1 - Class of 2009 CST Test-Taking Patterns Since 2005  
change to percentage**

TEST	2005 GRADE 8		2006 GRADE 9		2007 GRADE 10		2008 GRADE 11	
	Preuss	Comp.	Preuss	Comp.	Preuss	Comp.	Preuss	Comp.
English	100.0	100.0	100.0	100.0	100.0	97.4	98.9	97.4
8 <sup>th</sup> Grade Hist	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
World History	0.0	0.0	0.0	0.0	100.0	94.7	1.1	2.6
U.S. History	0.0	0.0	0.0	0.0	0.0	0.0	98.9	100.0
General Math	0.0	18.4	0.0	0.0	0.0	0.0	0.0	0.0
Algebra 1	83.9	81.6	8.0	28.9	1.1	5.3	0.0	2.6
Geometry	14.9	0.0	77.0	60.5	13.8	28.9	1.1	7.9
Algebra 2	1.1	0.0	12.6	2.6	72.4	52.6	29.9	23.7
H.S. Math 9-11	0.0	0.0	1.1	0.0	12.6	7.9	67.8	42.1
Int Math 1	0.0	0.0	0.0	2.6	0.0	0.0	0.0	7.9
Int Math 2	0.0	0.0	0.0	2.6	0.0	5.3	0.0	0.0
Int Math 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3
Physics	0.0	0.0	98.9	92.1	5.7	0.0	0.0	5.3
Chemistry	0.0	0.0	0.0	0.0	93.1	81.6	5.7	15.8
Biology	0.0	0.0	0.0	5.3	1.1	18.4	94.3	68.4
Science 10	0.0	0.0	0.0	0.0	100.0	97.4	1.1	0.0
Earth Science	0.0	0.0	0.0	2.6	0.0	0.0	0.0	5.3

*Source: SDUSD data*

N=87 students total (Preuss); 38 students total (Comparison).

### Section 3: Standardized Test Results by Subject Area

This section provides information on all standardized tests taken by the graduating Class of 2009, where sufficient numbers permit.<sup>6</sup> Tables 3.1 – 3.6 show the specific test taken, the year the test was taken, the average scaled score earned by both the Preuss and comparison groups (including the number of students in each group), and the p-value associated with the statistical test performed. Observed p-values less than or equal to 0.05 are individually statistically significant at conventional levels. As described in the preceding section, many of the CST tests results could not be analyzed because of small sample sizes.

The difference between the average Preuss and Comparison group scale scores is statistically significant on most examinations, with the Preuss students the higher performing group in all cases that reached statistical significance. However, these results can not be convincingly attributed to school effects given the significantly higher performance of Preuss students at the baseline.

The average district scale score for economically disadvantaged students is also presented in Tables 3.1 – 3.6 as a reference point. Preuss and Comparison group students both consistently score above the district average. This suggests that the students who apply to

<sup>6</sup> For privacy reasons, results are only reported for tests taken by at least four students in a given year.

Preuss are a unique group of economically disadvantaged students who would outperform their peers regardless of whether or not they attended the Preuss school.

**Table 3.1 - Class of 2009 Standardized Test Performance, Social Sciences**

<b>TEST</b>	<b>PREUSS SCALE SCORE</b>	<b>COMP. SCALE SCORE</b>	<b>P-VALUE</b>	<b>DISTRICT AVG SCALE SCORE</b>
CST 8 <sup>th</sup> Grade History (2005)	384 (N=87)	348 (N=38)	<0.001*	306
CST World History (2007)	381 (N=87)	344 (N=36)	0.003*	305
CST U.S. History (2008)	413 (N=86)	357 (N=38)	<0.001*	309

*Source: SDUSD data; California Department of Education (<http://star.cde.ca.gov/star2002/Reports.html>)*

**Table 3.2- Class of 2009 Standardized Test Performance, English Language Arts**

<b>TEST</b>	<b>PREUSS SCALE SCORE</b>	<b>COMP. SCALE SCORE</b>	<b>P-VALUE</b>	<b>DISTRICT AVG SCALE SCORE</b>
CAT6 Language Arts 6 <sup>th</sup> (2003)	684 (N=87)	674 (N=38)	0.100	635
CAT6 Language Arts 7 <sup>th</sup> (2004)	693 (N=87)	678 (N=37)	0.019*	646
CST English Language Arts 6 <sup>th</sup> (2003)	379 (N=87)	363 (N=38)	0.025*	315
CST English Language Arts 7 <sup>th</sup> (2004)	381 (N=86)	358 (N=36)	<0.001*	313
CST English Language Arts 8 <sup>th</sup> (2005)	383 (N=87)	362 (N=38)	0.004*	319
CST English Language Arts 9 <sup>th</sup> (2006)	411 (N=87)	376 (N=38)	<0.001*	318
CST English Language Arts 10 <sup>th</sup> (2007)	398 (N=87)	367(N=37)	<0.001*	312
CST English Language Arts 11 <sup>th</sup> (2008)	391 (N=86)	364 (N=37)	0.015*	307

*Source: SDUSD data; California Department of Education (<http://star.cde.ca.gov/star2002/Reports.html>)*

**Table 3.3 - Class of 2009 Standardized Test Performance, Reading**

<b>TEST</b>	<b>PREUSS SCALE SCORE</b>	<b>COMP. SCALE SCORE</b>	<b>P-VALUE</b>	<b>DISTRICT AVG SCALE SCORE</b>
CAT6 Reading 6 <sup>th</sup> (2003)	685 (N=87)	674 (N=38)	0.016*	637
CAT6 Reading 7 <sup>th</sup> (2004)	698 (N=87)	679 (N=37)	0.003*	644

*Source: SDUSD data; California Department of Education (<http://star.cde.ca.gov/star2002/Reports.html>)*

**Table 3.4 - Class of 2009 Standardized Test Performance, Spelling**

<b>TEST</b>	<b>PREUSS SCALE SCORE</b>	<b>COMP. SCALE SCORE</b>	<b>P-VALUE</b>	<b>DISTRICT AVG SCALE SCORE</b>
CAT6 Spelling 6 <sup>th</sup> (2003)	686 (N=87)	676 (N=38)	0.133	645
CAT6 Spelling 7 <sup>th</sup> (2004)	694 (N=87)	678 (N=37)	0.008*	656

*Source: SDUSD data; California Department of Education (<http://star.cde.ca.gov/star2002/Reports.html>)*

**Table 3.5 - Class of 2009 Standardized Test Performance, Mathematics**

<b>TEST</b>	<b>PREUSS SCALE SCORE</b>	<b>COMP. SCALE SCORE</b>	<b>P-VALUE</b>	<b>DISTRICT AVG SCALE SCORE</b>
CAT6 Mathematics 6 <sup>th</sup> (2003)	697 (N=87)	680 (N=38)	0.009*	645
CAT6 Mathematics 7 <sup>th</sup> (2004)	709 (N=87)	694 (N=37)	0.059	655
CST Mathematics 6 <sup>th</sup> (2003)	387 (N=87)	353 (N=38)	0.001*	309
CST Mathematics 7 <sup>th</sup> (2004)	384 (N=87)	359 (N=37)	0.006*	313
CST Algebra 1 (2005)	340 (N=73)	350 (N=31)	0.277	318
CST Geometry (2005)	403 (N=13)	---	---	413
CST General Mathematics (2005)	---	328 (N=7)	---	293
CST Algebra 1 (2006)	377 (N=7)	325 (N=11)	0.073	274
CST Algebra 2 (2006)	374 (N=11)	---	---	306
CST Geometry (2006)	330 (N=67)	328 (N=23)	0.875	299
CST Algebra 2 (2007)	345 (N=63)	292 (N=20)	0.001*	294
CST Geometry (2007)	317 (N=12)	280 (N=11)	0.067	261
CST H.S. Math (2007)	397 (N=11)	---	---	337
CST Algebra 2 (2008)	309 (N=26)	280 (N=9)	0.101	257
CST H.S. Math (2008)	346 (N=59)	306 (N=16)	0.024*	299

**Source:** SDUSD data; California Department of Education (<http://star.cde.ca.gov/star2002/Reports.html>)

**Table 3.6 - Class of 2009 Standardized Test Performance, Natural Sciences**

<b>TEST</b>	<b>PREUSS SCALE SCORE</b>	<b>COMP. SCALE SCORE</b>	<b>P-VALUE</b>	<b>DISTRICT AVG SCALE SCORE</b>
CST Physics (2006)	348 (N=86)	308 (N=35)	<0.001*	291
CST Physics (2007)	314 (N=5)	---	---	282
CST Chemistry (2007)	354 (N=81)	305 (N=31)	<0.001*	290
CST Science 10 (2007)	360 (N=87)	326 (N=37)	<0.001*	294
CST Biological Sciences (2007)	---	346 (N=7)	---	308
CST Chemistry (2008)	310 (N=5)	317 (N=6)	0.727	283
CST Biological Sciences (2008)	381 (N=82)	353 (N=26)	0.008*	323

**Source:** SDUSD data; California Department of Education (<http://star.cde.ca.gov/star2002/Reports.html>)

## Section 4: Grade Point Averages and AP Classes

Table 4.1 provides information on the average cumulative weighted and unweighted high school GPA for the Preuss Graduating Class of 2009 and comparison group students. A student's unweighted GPA represents the grades earned for courses taken, without adjustment for course difficulty. A student's weighted GPA takes into account the additional grade point earned for each advanced placement (AP), International Baccalaureate (IB), and honors course taken and passed during high school. Preuss students had higher average unweighted and weighted GPAs relative to control group students, and this difference is statistically significant. The magnitude of the difference is of practical significance, about a third of a grade point for the unweighted GPA and almost half a grade point for the weighted GPA – large enough to impact both college eligibility and choice of college.

**Table 4.1 Class of 2009 Cumulative GPA**

<b>ACADEMIC YEAR</b>	<b>PREUSS</b>	<b>COMP.</b>	<b>P-VALUE</b>
Unweighted GPA	3.26	2.95	0.002*
Weighted GPA	3.50	3.05	<0.001*
<i>Source: SDUSD data</i>			

N=87 students (Preuss); 37 students (Comparison).

Comparing these results to the unweighted GPA's, it is clear that Preuss students took more AP and honors courses than the comparison group students. The difference in AP course taking was dramatic; Preuss students took, on average, 6.5 years of AP courses and the comparison groups took 3 years. This very large difference in AP courses translated into substantial differences in the cumulative weighted GPA. The one-fifth grade point difference had important practical implications for Preuss students in terms of college eligibility and the choice of which college to attend.

Table 4.3 shows the AP class-taking patterns of the Class of 2009. The first column shows the average number of AP tests attempted in a given school year per student. The second column shows the average score on the AP exam. After taking course repeats into account, Preuss students attempted an average of 6.57 AP classes throughout their high school years and scored an average of 2.37 on these exams. On 42% of these exams, students earned a 3, 4 or 5, thus potentially receiving college credit for these courses.

**Table 4.3 Preuss Class of 2008 AP Classes by Academic Year<sup>7</sup>**

<b>ACADEMIC YEAR</b>	<b>AP CLASSES ATTEMPTED</b>	<b>AVG SCORE ON AP EXAM</b>	<b>% EARNED 3 OR HIGHER</b>	<b>% EARNED 4 OR HIGHER</b>
2005-06 (9 <sup>th</sup> Grade)	0.47	4.15	98%	78%
2006-07 (10 <sup>th</sup> Grade)	1.69	2.04	37%	14%
2007-08 (11 <sup>th</sup> Grade)	1.33	2.34	38%	15%
2008-09 (12 <sup>th</sup> Grade)	3.07	2.28	39%	18%
<b>Cumulative</b>	<b>6.57</b>	<b>2.37</b>	<b>42%</b>	<b>20%</b>
<i>Source: The Preuss School</i>				

<sup>7</sup> The CDE also reports AP test-taking patterns across schools, but it does not break things apart by grade level. As a result, it is impossible to track the performance of the Class of 2009 across years in this dimension. Individual-level test results are not available at this time.

## Section 5: A-G Completion Rates

The University of California and the California State University have jointly determined both the subject areas and number of courses a student must take and pass (with a grade of “C” or better) to be eligible for admission to public four-year institutions in California. Collectively, these requirements are referred to as the “A-G requirements.” Table 5.1 shows each of the subject areas and the minimum and recommended number of years of study required for college eligibility:

**Table 5.1 A-G Requirements for CSU and UC Admission**

REQUIREMENT	SUBJECT AREA	YEARS OF STUDY REQUIRED
“A”	History / Social Science	2
“B”	English	4
“C”	Mathematics	3 required (4 recommended)
“D”	Laboratory Science	2 required (3 recommended)
“E”	Language other than English	2 required (3 recommended)
“F”	Visual and Performing Arts	1
“G”	Electives	1
<b>All Requirements</b>	<b>Total Years: 15 required, 18 recommended</b>	

For the Class of 2009 we analyzed courses taken using unofficial transcripts from the Preuss School and administrative datasets supplied by SDUSD. Table 5.2 shows the percentage of students in each group completing the A-G requirements and it also provides the average number of years of study accumulated by each group in the various subject areas. Although many comparison group students in past years came close to completing the required years of study in several subject areas, the “all or none” nature of the A-G requirements drove down the percentage of students graduating with successful completion for that group.

Out of the 87 Preuss students, 59 (68%) completed all A-G requirements successfully. Of the students not completing A-G, mathematics (the “C” requirement) and foreign language (the “E” requirement) were the two requirements most likely to be incomplete. Mathematics is generally the category with the greatest number of A-G non-completions.

**Table 5.2 Class of 2009 A-G Completion Rates by Requirement**

<i><b>A-G REQUIREMENT</b></i>	<i><b>PREUSS % COMPLETE</b></i>	<i><b>COMP. % COMPLETE</b></i>
A – History & Social Sciences	97%	84%
B – English Language Arts	99%	55%
C – Mathematics	82%	63%
D – Natural Sciences	99%	89%
E – Lang. other than English	84%	82%
F – Visual and Performing Arts	100%	82%
G – Elective	98%	92%
All Requirements	<b>68%</b>	<b>37%</b>
<i>Source: The Preuss School; SDUSD data</i>		

N=87 students (Preuss); 38 students (Comparison).

**Table 5.3 Class of 2009 A-G Courses Taken by Requirement**

<b>A-G REQUIREMENT</b>	<b>PREUSS CLASSES</b>	<b>COMP. CLASSES</b>	<b>P-VALUE</b>
A – History & Social Sciences	1.98	1.86	0.014*
B – English Language Arts	4.00	3.45	<0.001*
C – Mathematics	2.79	2.80	0.943
D – Natural Sciences	2.00	2.78	<0.001*
E – Lang. other than English	1.91	2.63	<0.001*
F – Visual and Performing Arts	1.00	0.84	<0.001*
G – Elective	0.98	0.92	0.118
All Requirements	<b>14.65</b>	<b>13.29</b>	<b>&lt;0.001*</b>

*Source: The Preuss School; SDUSD data*

N=87 students (Preuss); 37 students (Comparison).

## Section 6: High School Exit Exam

The State of California, as a requirement for graduation, requires each student to take and pass the California High School Exit Exam (CAHSEE). By the end of the tenth grade, each student is expected make their first attempts to take and pass sections in Mathematics and English. These sections may be taken and passed individually, with retakes allowed until the student passes. Table 6.1 reports the performance on the CAHSEE by the end of the tenth grade for the Preuss and comparison group students of 2009. Both the Preuss students and the comparison students entering the tenth grade in the 2006-07 school year took and passed both portions of the examination at a 100% rate.

**Table 6.1 Class of 2009 10<sup>th</sup> Grade CAHSEE Performance**

<b>PERCENT OF STUDENTS...</b>	<b>PREUSS</b>	<b>SDUSD</b>
Taking English	100%	100%
Passing English	100%	100%
Taking Mathematics	100%	100%
Passing Mathematics	100%	100%
Taking Both Portions	100%	100%
Passing Both Portions	100%	100%

*Source: SDUSD data*

N=87 students (Preuss), 38 students (SDUSD).

## Section 7: College Entrance Examinations and College Enrollment

Table 7.1 provides the average scores earned, by decile, for the 2009 Preuss graduates compared against the SDUSD, San Diego County, and California statewide averages on the examinations.<sup>8</sup> Two points are worth noting. The first is that the “percent tested” reported by the CDE is computed by dividing the total number of test scores recorded, by the 12<sup>th</sup> grade enrollment. This tends to inflate the percent of students reported as taking the test because the calculation includes all attempts and does not adjust for students making multiple attempts at the examination. The second point is that the information reported by the CDE does not isolate the “best score” achieved by each student. Because of this, we are unable to estimate whether multiple attempts at the examinations tend to inflate or deflate the differences in average scores reported by the CDE. If, on average, the higher scoring students made multiple attempts and those scores were as high as or higher than their initial attempt, then the net effect would be inflationary. The reverse would be true if

8 Obtained from the California Department of Education website (<http://data1.cde.ca.gov/dataquest/>)

predominantly lower scoring students made multiple attempts and did not improve on their initial performance in subsequent attempts.

Because all Preuss students were required to take the SAT I and II, it is not reasonable to compare their average score with that attained by schools where students were allowed to “self-select” whether to take the test or not. The exact percentage varies from school to school, but in general, fewer than 50% of students take these tests. Those students are likely college bound and in the upper half of their graduating classes in terms of GPA and courses taken. By presenting the average scores of Preuss students by deciles, readers are free to make their own judgment about what proportion of Preuss test takers represent an “apples to apples” comparison to the district.

The individual-level Preuss data report the average maximum score per student based on data provided by Preuss, by deciles. For instance, the top 50% of Preuss students had an average SAT-1 composite score of 1822, while the top 90% of Preuss students had an average SAT-I composite score of 1688. In the lower portion of the table, average scores are reported from the CDE website. The data in the upper and lower portions of the table come from different sources and are calculated using different methods—namely, the CDE uses the average score from multiple attempts while the individual-level calculations use each student’s highest score. As such, one should exercise caution when comparing the individual-level data reported by Preuss with the average scores reported by the CDE.

Looking at testing rates, Preuss students take the SAT-I at extremely high rates, while fewer than half of all students in the district do so. The scores reported by deciles demonstrate the importance of these different test-taking rates in determining the average performance of different groups of students. If the top half of the students in the district are being tested and compared with the Preuss students, this will bias the comparison in favor of the district to a large degree.

**Table 7.1 Preuss Class of 2009 SAT I and II Scores<sup>9</sup>  
(Composite Score: Mathematics + English + Writing)**

TOP %	100	90	80	70	60	50	40	30	20	10
<b>PREUSS (Individual)</b>	1649	1688	1723	1752	1786	1822	1858	1912	1981	2115
	<b>Testing Rate</b>			<b>Average Score</b>						
<b>PREUSS (CDE)</b>	100.00%			1633						
<b>SDUSD</b>	44.92%			1470						
<b>COUNTY</b>	35.11%			1535						
<b>STATE</b>	34.68%			1502						
<i>Source: The Preuss School; California Department of Education, Educational Demographics Office (<a href="http://data1.cde.ca.gov/dataquest/">http://data1.cde.ca.gov/dataquest/</a>)</i>										

For the Class of 2009, the average score of the Preuss test takers was higher than that recorded by students in the district and state. The scores earned on the SAT’s are indicators of academic achievement rather than the sole determinants of college acceptance. When combined with GPA and completion of the A-G requirements, these indicators determine both the eligibility and competitive standing of college the applications made by each graduate.

Table 7.2 shows the number and percentage of Preuss graduates in the Class of 2009 submitting a Statement of Intent to Register (SIR) to each segment of higher education as

<sup>9</sup> Average scores and percent of students taking the SAT 1 for the SDUSD, County, and State were obtained from the CDE website.

of May 2009, as provided by the Preuss Board of Directors. The SIR is not a perfect predictor of actual college enrollment, because students can change their mind even after they notify a college of their enrollment plans. However, until we obtain actual enrollment information from colleges, SIR is the best indicator we have available.

This table shows that 83% of the graduating class of 2009 intends to enroll in 4-year colleges and universities in the Fall of 2009 and 13% intend to enroll in community colleges. According to the Preuss Board of Directors, those Preuss students who attend California Community Colleges (CCC) are offered dual admission or Guaranteed Transfer in which students enter the UC as juniors after completing 2 years of approved community college course work.

**Table 7.2 Preuss Class of 2009 SIR by Higher Education Segment**

	<b>NUMBER OF STUDENTS</b>	<b>PERCENT OF CLASS</b>
<b>UC</b>	26	27%
<b>CSU</b>	23	24%
<b>Private</b>	31	32%
<b>Total 4-Year College</b>	<b>80</b>	<b>83%</b>
<b>Community College</b>	12	13%
<b>US Armed Forces</b>	1	1%
<b>Total</b>	<b>93</b>	<b>97%</b>
<i>Source: The Preuss School</i>		