

Comparing 5th Grade CAST™ Passing Rates for STEMscopes and Non-STEMscopes Districts in California

The following report includes results comparing STEMscopes and non-STEMscopes districts on the 2018-2019 State of California Science Test (CAST). This is the first year that the CAST was used throughout the state. Districts were identified as STEMscopes districts if they had a subscription to STEMscopes for the students in the tested grades (i.e., 5th grade) and showed usage of STEMscopes based on the analytics data. The state of California creates benchmarks for proficiency in overall science and identifies students as below standard, near standard, standard met, and standard exceeded. The percent of students in each of these categories is used to determine the district's achievement in science. The percentage of students who "met or exceeded" the standard (i.e., a combination of the latter two categories) is used by the state as the district passing rate. California also provides benchmarks of "Below," "Near," and "Above" for the specific science subject areas of Life Sciences, Physical Sciences, and Earth & Space Sciences.

ELEMENTARY SCHOOL CAST RESULTS

The state average passing rate for all California school districts that include 5th grade (N = 1,181) was 31.7%. Of these districts, 169 (14.3%) districts used the STEMscopes science curriculum during this school year, and 1012 districts used either a district-created science curriculum or purchased a different science curriculum. The rates of proficiency for these two groups of districts are found in the table below. The average passing rate (those who “meet and exceed”) for the STEMscopes districts was 36.1% and was significantly higher than the average passing rate for the non-STEMscopes districts, which was 30.3%. Thus, districts that used STEMscopes had a 5.8 percent higher passing rate than districts that did not use STEMscopes. This is equivalent to approximately 3,704 more 5th grade students passing the California CAST standards in districts that used STEMscopes. Note, when considering separately students who “met” the standard and those who “exceeded” the standard, in both cases, districts that used STEMscopes had significantly higher passing rates than districts that did not use STEMscopes. Conversely, districts that did not use STEMscopes had significantly more students below standard than STEMscopes districts.

	Below	Near	Met	Exceeded	Met & Exceeded
STEMscopes Districts (n = 169)	16.7%	47.2%	21.5%	14.6%	36.1%
Non-STEMscopes Districts (n = 1012)	18.7%	51.0%	19.6%	10.7%	30.3%

Achievement on the specific subject areas followed a similar pattern such that districts that used STEMscopes had significantly more students who were “above” standard in Life Sciences, Physical Sciences, and Earth & Space Sciences than districts that did not use STEMscopes.

In addition, achievement for specific subgroups of students was examined. In the table below, are the passing rates by STEMscopes districts and non-STEMscopes districts for economically disadvantaged, minority, and students with limited English proficiency (LEP). Economically disadvantaged students, students with a reported disability, and Latino students had significantly higher passing rates in STEMscopes districts compared to non-STEMscopes districts. There were no significant differences across districts for LEP and African American students.

STUDENTS	Economically Disadvantaged	With A Disability	African American	Latino	LEP
STEMscopes Districts	23.2%	13.2%	19.2%	24.0%	5.1%
Non-STEMscopes Districts	20.7%	10.7%	18.8%	21.2%	4.8%

Follow-up Analysis on Elementary Results

A research follow-up study was conducted to ensure that these differences remained statistically significant after accounting for other important variables that influence student achievement. Specifically, multiple regression analysis was utilized to recalculate these passing rates taking into account important district demographics, including district size, whether the district included charter schools, average teacher experience and education level, district attendance rate, and demographic information of students (i.e., socioeconomic status, LEP status).

Results showed that, when accounting for these important variables, districts that used STEMscopes continued to have significantly higher overall science passing rates compared to districts that did not use STEMscopes (see table below). Specifically, STEMscopes districts had a weighted passing rate of 32.8%, and non-STEMscopes districts had a weighted passing rate of 30.6%. In other words, **using the STEMscopes curriculum increased passing rates by 2.2% even after accounting for important demographic variables.**

MULTIPLE REGRESSION RESULTS	B	Standard Error	p-value
STEMscopes	2.22*	0.76	<0.05
Number of Students	0.23	0.42	0.50
Charter District	-0.60	0.41	0.14
District Attendance Rate	-0.98	0.45	<0.05
Average Teacher Experience in District	1.79	0.43	<0.05
Average Teacher Education Level in District	1.79	0.43	<0.01
Free and Reduced Lunch % in District	-13.05	0.40	<0.01

CONCLUSION

Districts that used STEMscopes had higher 5th grade passing rates than districts that did not use STEMscopes during the first year administration of the California Science Test (CAST). Controlling for several important demographic variables, STEMscopes districts still increased the proficiency rate of their students by 2.2%. In addition to overall passing rates, results showed that passing rates for economically disadvantaged, minority, and LEP students were higher in STEMscopes districts than non-STEMscopes districts. These findings show continued evidence that STEMscopes is associated with increases in student science achievement.