



COMPARING STAAR™ 8TH GRADE SCIENCE PASSING RATES FOR

Matched STEMscopes & Non-STEMscopes Districts in Texas in 2021

The following report includes results comparing matched STEMscopes and non-STEMscopes districts on the science component of the 2020-2021 State of Texas Assessment of Academic Readiness (STAAR™) for 8th grade. Districts were identified as STEMscopes districts if they had a subscription to STEMscopes and showed usage of STEMscopes Science in 8th grade for at least 50% of middle schools in a given district, based on analytic data. Once we had identified STEMscopes districts, they were matched with non-STEMscopes districts. Matching was based on the Texas' Education Agency's district types (e.g., urban, major suburban), then district size, and via a district's percent of students classified as economically disadvantaged (i.e., free and reduced lunch).

On the STAAR assessment, the state of Texas creates proficiency benchmarks that identify students as 'not proficient', 'approaching', 'meeting', or 'mastering' grade-level proficiency. The percentage of students who 'approach' grade-level performance is used by the state as the district passing rate and we used this as the outcome in the study. We also included the percentage of 5th grade students who approached grade level science proficiency from the 2017-2018 STAAR assessment. We used the 2017-2018 assessment because the students who contributed data to the 8th grade proficiency rate in 2021 would have been in 5th grade in 2018. The 5th grade proficiency rate provides a baseline science achievement level across study districts.

Middle School STAAR Results

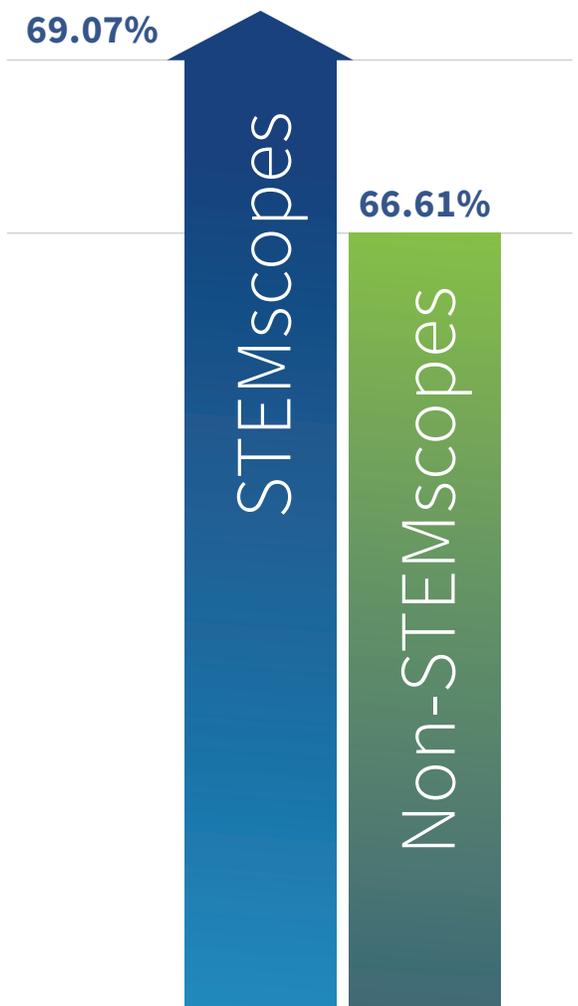
After matching, our sample included 758 districts (379 STEMscopes and 379 non-STEMscopes districts). As can be seen in Table 1, the STEMscopes districts and the non-STEMscopes districts did not statistically differ in regards to district size; students racial/ethnic make-up; special education, gifted, or LEP status nor by average teaching experience in the district. Importantly, there were no differences in baseline 5th grade proficiency between STEMscopes (73.27% proficiency) and non-STEMscopes districts (72.13%). It is important to establish that the STEMscopes districts and the non-STEMscopes districts did not differ on these key variables, particularly baseline science proficiency as this ensures that potential differences in 8th grade science proficiency across districts are comparable (and are not due to previous differences).

For the 8th grade STAAR science assessment in 2021, the state average proficiency rate for all Texas school districts (N = 1146) was 67%. Within our study (n = 758), the unweighted total average proficiency rate was 67.84%. **The unweighted average proficiency rate for the STEMscopes districts was 69.07%, versus 66.61% in non-STEMscopes districts.** This was a significant difference (b = 2.45, p < .05).

TABLE 1: BASELINE COMPARISON OF STEMSCOPES AND NON-STEMSCOPES DISTRICTS

Variables	Total	NON-STEMscopes	STEMscopes	t-value	p-value
Baseline District 5th Grade Science Proficiency	72.7	72.13	73.27	1.09	0.28
District Size	4801.8	4507.11	5096.52	0.70	0.49
% Economically Disadvantaged Students	61.62	61.48	61.77	0.19	0.85
% Black/African American Students	8.93	8.36	9.51	1.13	0.26
% Latino/Hispanic Students	43.8	43.40	44.20	0.4	0.69
% Asian Students	1.59	1.79	1.39	1.25	0.21
% White/Caucasian Students	42.71	43.32	42.09	0.64	0.52
% LEP Students	12.18	12.05	12.31	0.26	0.8
% Special Education Students	10.06	10.20	9.93	1.24	0.21
% Gifted Students	5.73	5.56	5.90	1.34	0.18

TABLE 2: UNWEIGHTED SCIENCE PROFICIENCY RATES BY STEMSCOPES STATUS IN TEXAS TEXAS 8TH GRADE SCIENCE PROFICIENCY "PASSING"



Follow-up Analysis on Middle School Results

We conducted a follow-up analysis to further test differences across STEMscopes and non-STEMscopes districts after accounting for other important variables that influence science proficiency. Importantly, we wanted to account for 2018 5th grade science proficiency as previous science proficiency tends to be a strong predictor of future science proficiency. By including this and other demographic variables in the model, we provide a stringent test of the effect of STEMscopes. Put another way, this provides a weighted effect. We used multiple regression to recalculate proficiency rates taking into account 2017-2018 5th grade science proficiency as well as district size,

average teacher experience, and district demographic make-up (i.e., percent of district students via race/ethnicity categories, socioeconomic status, LEP status, SPED status and gifted and talented status). Results are presented in Table 3 and Figure 1 below. The results indicate that once other important variables are accounted for, **the districts that used STEMscopes still have a significantly higher overall 8th grade science proficiency rates compared to non-STEMscopes districts.** Specifically, there is a weighted increase of 2.29% in 8th grade science proficiency for STEMscopes versus non-STEMscopes districts.

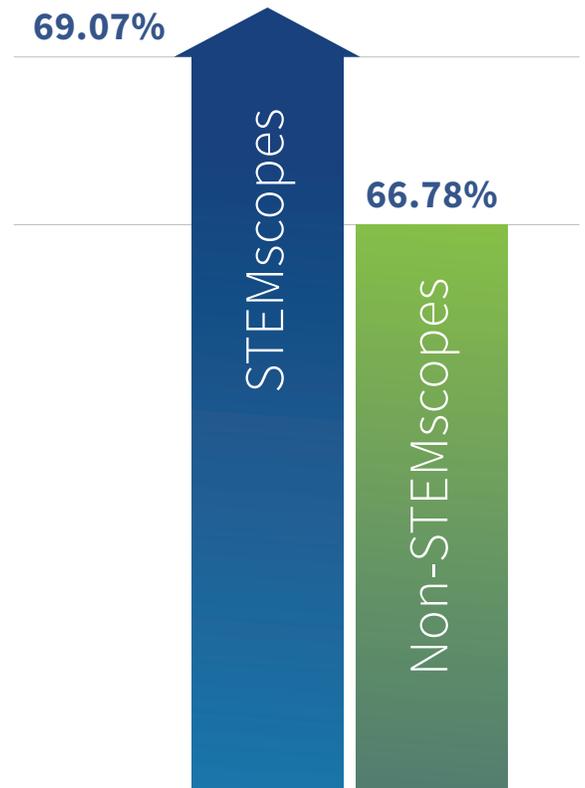
Subpopulation Analyses

In addition, weighted proficiencies for specific subgroups of students were examined. Specifically, among economically disadvantaged students, STEMscopes districts (63.04% proficient) had higher passing rates than non-STEMscopes districts (60.57%) controlling for baseline 5th grade science proficiency and all other demographic variables, (b = 2.47, p < .05). There were no other significant differences among sub-populations, although results numerically favored STEMscopes districts.

TABLE 3: REGRESSION RESULTS EVALUATING 8TH GRADE SCIENCE PROFICIENCY FOR ALL STUDENTS

Predictors of STAAR	8th grade science proficiency: all study students (n = 153,289)	
	B (SE)	p-value
Intercept (proficiency in non-STEMscopes districts)	66.78 (1.23)	<.001
STEMscopes	2.29 (0.62)	<.01
5th Grade Baseline Science Proficiency	4.82 (0.88)	<.001
District Size	-0.33 (0.49)	0.49
Teacher Experience	0.60 (0.55)	0.28
% Economically Disadvantaged Students	-4.77 (0.73)	<.001
% Black/African American Students	-0.27 (3.42)	0.94
% Latino/Hispanic Students	0.85 (6.29)	0.89
% Asian Students	0.68 (0.62)	0.56
% White/Caucasian Students	4.44 (0.51)	0.49
% LEP Students	-1.48 (0.62)	<.05
% Special Education Students	-1.64 (0.51)	<.01
% Gifted Students	-0.29 (0.48)	0.55

FIGURE 1: 8TH GRADE SCIENCE PROFICIENCY IN MATCHED STEMSCOPES AND NON-STEMSCOPES SCIENCE SCHOOLS



Conclusion

Despite 2021 representing a year of educational disruption via the COVID-19 worldwide pandemic, Texas school districts that used STEMscopes Science for 8th grade instruction still had higher Science proficiency rates compared to match non-STEMscopes districts, even when controlling for baseline science proficiency and other important variables that can impact science proficiency. STEMscopes districts increased the 8th grade science proficiency rate of their students by a weighted average of 2.29%. Follow-up analyses indicated that the weighted passing rate for economically disadvantaged students (2.47%) was also similarly higher compared to matched non-STEMscopes districts. We estimate that, overall, this means that approximately an *additional* 3,510 eighth grade students passed the state of Texas ‘passing’ benchmark. These findings show continued evidence that STEMscopes science curriculum is associated with increases in student science achievement.