

Chapin Hall Research Brief



Achievement Gaps in St. Charles Community Unit School District 303

This report highlights the assessment results from 2019 and 2021 and achievement gaps identified in St. Charles Community Unit School District (CUSD) 303. The findings indicate that achievement gaps are found along the lines of demographic characteristics and socioeconomic status in the district that mirror national trends.

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Introduction

The achievement gap is persistent disparities in academic achievement across different student characteristics. The achievement gap can be measured through a number of indicators, including grades, standardized-test scores, attendance, and dropout rates. The troubling performance gaps between African-American and Hispanic students at the lower end of the performance scale and their white peers are most commonly reported. A similar academic disparity between students from low-income families and those who are better off is also found in many school districts across the county. In recent years, scholars and policymakers have begun to expand their focus on other achievement gaps, such as those based on gender, English-language proficiency, and learning disabilities.

To gain greater insight into achievement gaps and to explore potential resolutions in St. Charles Community Unit School District (CUSD) 303, this report identifies patterns of disparities in the Scholastic Aptitude Test (SAT) for 9th through 11th grades and Illinois Assessment of Readiness (IAR) for 3rd through 8th grades during School Years (SY) 2019 and 2021. The findings indicate that there are disparities in academic performance measured by assessments across various student characteristics

including gender, race/ethnicity, and socioeconomic status. While some achievement gaps are unique to each grade level, others are persistent across grade levels. This report highlights variations in achievement gaps by student characteristics and examines the impact of altered mode of instruction that occurred due to the pandemic during SY2021.

The three categories of student groups considered for achievement gaps were demographic characteristics of students, socioeconomic backgrounds, and school-related status.

Demographic characteristics include gender and race/ethnicity. Gender uses binary categories of female/male. Race and ethnicity were combined to identify white, black, Asian, American-Indian/Alaskan Native, Multiple race, and Hispanic. Pacific Islander students were omitted from the analysis due to the small number of students. Multiple race groups were also omitted despite their increasing presence in recent years due to the complexity of analyzing various combinations within the category.

Students' socioeconomic status is measured based on whether a student receives free or reduced lunch and homelessness in a given school year. As for school-related status, English language learners and those students who receive special education based on the Individuals with Disabilities Education Act of 1975 were identified. In addition, the number of schools enrolled within the district was tabulated to gauge the impact of mobility. For SY2021, instructional mode (percentage of instruction as remote instruction) was also considered during the pandemic.

This project has received exempt status approval from the University of Chicago Institutional Review Board (IRB Protocol No. IRB22-0362), which means the research qualifies as no risk or minimal risk to the students of St. Charles CUSD 303 and is exempt from most of the requirements of the Federal Policy for the Protection of Human Subjects. The Data Sharing Agreement (DSA) between Chapin Hall and the District ensures secure transfer and storage of student-level data and proper and timely destruction of data upon project completion. The district has shared no names, addresses, or other potentially identifiable information.

Methods

SAT, a standardized assessment developed by [the Educational Testing Service](#) (ETS), is intended to measure students' readiness for college. SAT is administered in two areas: Evidence-Based Reading and Writing (EBRW) and Mathematics. In Illinois, SAT results can be [interpreted in two ways](#): Illinois State Performance Levels or College Board National Benchmarks. The former is determined by the educators in Illinois as being standards for each

grade level, whereas the latter indicates whether a student is on track for college readiness. While the state performance level is helpful for accountability purposes, given that the levels are agreed upon by those who provide education in the state, the national benchmarks are more interpretive, meaning when the intent is to gauge the likelihood of academic performance at the next level. With college readiness as a conceptual goal, this analysis will use the national benchmarks as its SAT measure. The benchmark indicators are [divided into three levels](#):

Green: The section score meets or exceeds the benchmark.

Yellow: The section score is within one year’s academic growth of the benchmark.

Red: The section score is below the benchmark by more than one year’s academic growth.

In this analysis, those students who reached the green level were flagged, and the percentage of students who reached the green level was calculated for each grade level. For example, 85.1% of all students in 9th grade, 78% in 10th grade, and 83.4% in 11th grade reached the green level during SY2019 (Table 1).

Table 1. Percentage of Students at Green Level in SAT

Grade Level	SY2019				SY2021			
	EBRW		Math		EBRW		Math	
	N	% Green	N	% Green	N	% Green	N	% Green
9th Grade	1,028	85.1	1,028	77.3	882	68.1	882	66.8
10th Grade	1,131	78.0	1,131	59.7	898	87.1	898	75.5
11th Grade	1,063	83.4	1,063	72.6	1,003	83.2	1,003	64.8

IAR assesses [the New Illinois Learning Standards Incorporating the Common Core](#) and is administered in English Language Arts/Literacy (ELA/L) and Mathematics and uses performance levels to interpret student’s overall scale score:

Level 5: Exceeded expectations

Level 4: Met expectations

Level 3: Approached expectations

Level 2: Partially met expectations

Level 1: Did not yet meet expectations

The levels are then summarized by calculating the percentage of students who met or exceeded (levels 4 and 5) expectations (Table 2). The interpretation of these two levels is that [students have demonstrated readiness for the next grade level/course and, ultimately, are likely on track for college and careers.](#)

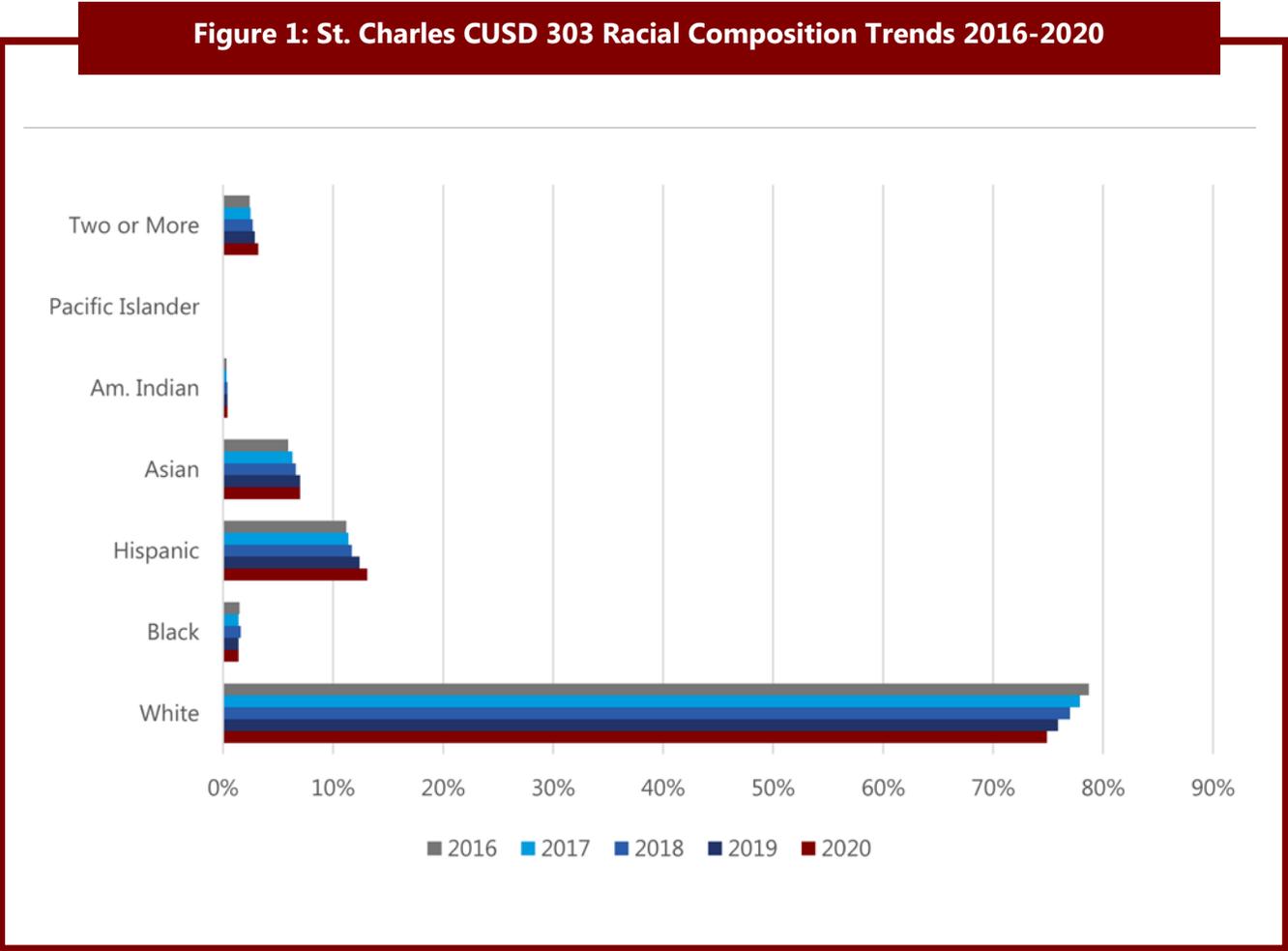
Table 2. Percentage of Students at Met or Exceeded Expectations in IAR

Grade Level	SY2019				SY2021			
	ELA/L		Math		ELA/L		Math	
	N	% M/E	N	% M/E	N	% M/E	N	% M/E
3rd Grade	772	48.8	772	59.2	607	49.4	608	57.1
4th Grade	753	57.6	740	60.3	687	49.2	680	52.2
5th Grade	815	61.6	815	51.0	683	56.8	683	53.7
6th Grade	878	69.4	878	49.2	656	47.6	656	44.7
7th Grade	911	73.9	911	58.4	642	49.5	642	45.0
8th Grade	949	72.0	949	62.3	721	56.3	721	51.0

When analyzing the achievement gap by race/ethnicity, the performance of white students is used as a reference point, given that this group is proportionately the largest racial group in the district (Figure 1). That is, the performance of those students in all other categories is compared to that of white students. Recent trends in St. Charles CUSD 303 show a steady decline among white students while the proportions of Hispanics and Asians have been increasing (Figure 1). Nevertheless, 3 out of 4 students (74.9%) of the students in the district are white students, according to [the most recent IL state report card.](#)

While not perfect, free/reduced lunch status has been [historically used as a proxy for socioeconomic status](#), if not an indicator of low income or poverty. This report makes a similar interpretation where free/reduced lunch is used to approximate students from low-income households. It is important, however, to note that there has been [a concern for reliability](#) due to the rapid and massive expansion of free lunch through the Community Eligibility Provision (CEP). The proportion of students in this category has remained stable at St. Charles CUSD 303 in recent years (Figure 2).

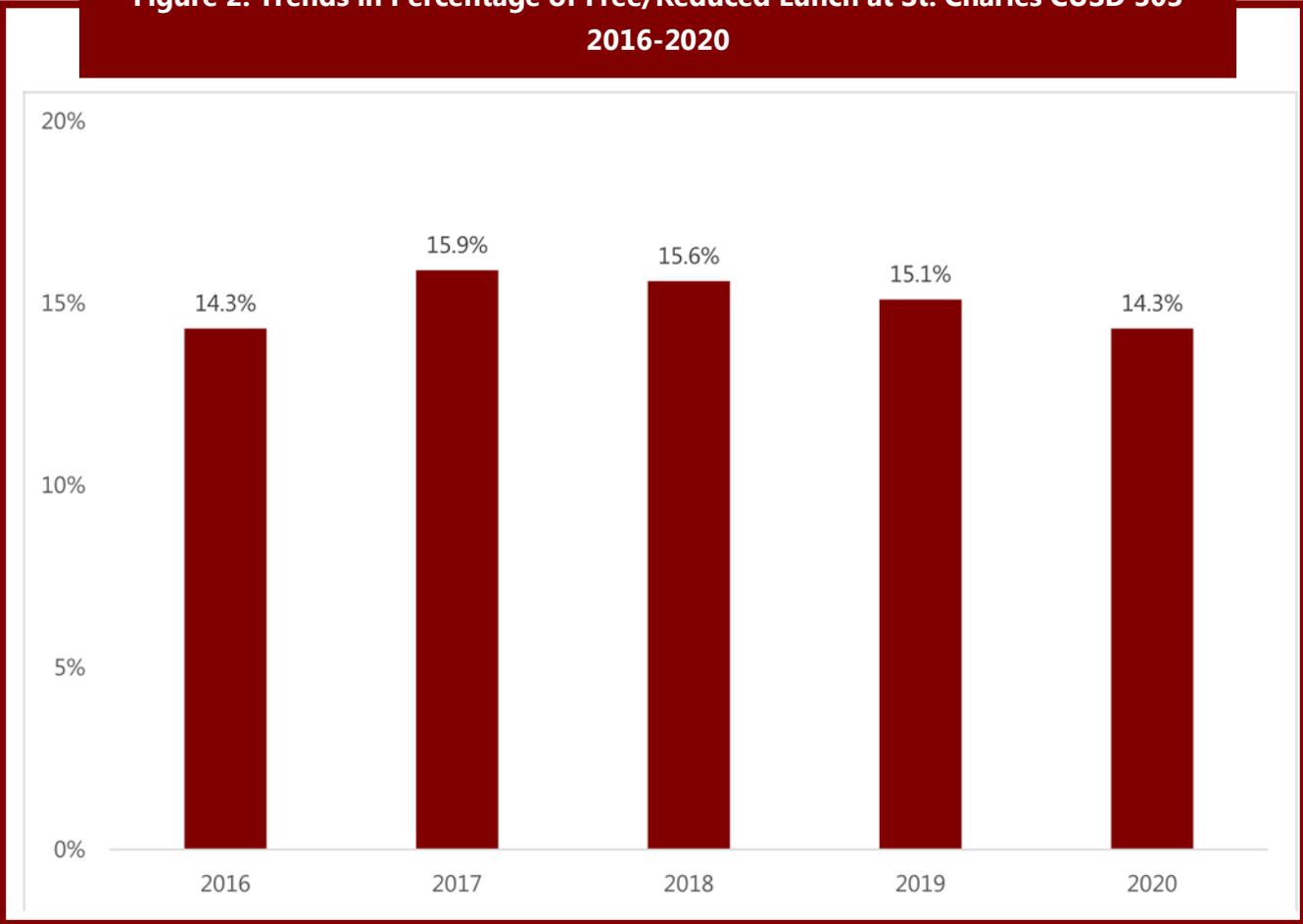
The determination of significant gaps in assessment was based on the results from logistic regression. All the characteristics considered were included in the statistical models, with a student’s likelihood of reaching green in SAT and meet/exceed in IAR as dependent variables (Appendices A through D).



Any group with fewer than ten students in a grade level will be omitted from comparisons to ensure the representativeness of groups and privacy of the students and will not be reported.

Despite recent concerns over [learning loss due to the pandemic](#), the assessment results at St. Charles CUSD 303 do not indicate consistent loss patterns across all grade levels. While the majority of grade levels have indeed experienced a noticeable decline in the percentages of students reaching proficiency levels or expectations, some grade levels and cohorts remained steady between SY2019 and SY2021. For example, 10th grade SY2019 had 59.7% of the students reaching the green level in math, and the same grade level achieved 75.5% during SY2021. Similarly, during SY2019, 48.8% of 3rd grade students met or exceeded expectations in ELA//L and the same cohort of students as 5th grade students during SY2021 reached 56.8%. While these patterns imply mixed trends at the aggregate level, a more in-depth analysis of student-level fluctuation in academic performance is strongly recommended for gauging learning loss during the pandemic.

Figure 2: Trends in Percentage of Free/Reduced Lunch at St. Charles CUSD 303 2016-2020



Findings

Achievement gap in SAT: Disparities by Race/Ethnicity

Significant achievement gaps by race/ethnicity were identified in EBRW and Math for SY2019 and SY2021, impacting Hispanic students the most (Table 3). The proportions of Hispanic students meeting or exceeding SAT benchmark (green level) were significantly smaller for 9th through 11th grades for both subjects in SY2019 and for 11th grade in SY2021 compared to white students.

For black students, the proportions were significantly smaller for 10th and 11th grades for both subjects in SY2019 and for 11th grade in SY2021 compared to white students. It is important to note that, while they met the minimum threshold to be included in the analysis, the presence of black students is substantially smaller than other racial/ethnic groups. Such disparity in size poses an analytical challenge in comparison and exaggerates the magnitude of the achievement gap between black and white students.

During the same period, the percentages of Asian students at the green level were significantly higher than that of white students in math for 10th grade during SY2019, EBRW and math for 9th grade, and math for 10th and 11th grades during SY2021, further widening the gap across race/ethnicity.

Table 3. Percentage of Students at Green Level in SAT by Race/Ethnicity

Grade Level	SY2019															
	EBRW								Math							
	White		Hispanic		Asian		Black		White		Hispanic		Asian		Black	
	N	% Green	N	% Green	N	% Green	N	% Green	N	% Green	N	% Green	N	% Green	N	% Green
9th Grade	831	88.0	121	61.2	63	93.7	10	80.0	831	80.9	121	48.8	63	87.3	10	70.0
10th Grade	911	81.9	119	53.8	72	81.9	20	35.0	911	62.2	119	37.8	72	76.4	20	20.0
11th Grade	883	86.7	101	54.5	62	93.5	14	42.9	883	76.2	101	40.6	62	83.9	14	28.6
Grade Level	SY2021															
	EBRW								Math							
	White		Hispanic		Asian		Black		White		Hispanic		Asian		Black	
	N	% Green	N	% Green	N	% Green	N	% Green	N	% Green	N	% Green	N	% Green	N	% Green

9th Grade	676	70.4	113	46.9	71	83.1	17	52.9	676	68.3	113	50.4	71	81.7	17	52.9
10th Grade	708	88.4	121	75.2	64	93.8	M		708	77.0	121	60.3	64	87.5	M	
11th Grade	814	87.2	118	55.1	58	87.9	10	60.0	814	68.9	118	30.5	58	81.0	10	50.0

Statistically Significant Disparity (p>0.05)

M = Fewer than 10 students

Achievement gap in SAT: Disparities by Free/Reduced Lunch status

Despite the challenges mentioned above of using free/reduced lunch status, those students receiving free/reduced lunch in the district had significantly lower percentages in the green level in all grade levels for both subjects during both school years (Table 4). A cohort that provided a glimpse of pre and post-pandemic trends was the 9th grade cohort during SY2019. They experienced a substantial decline in the number of students who have taken the SAT and the percentage of students at the green level among low-income students. In contrast, the number of all other students remained stable, and their academic performance experienced a minimal decline.

Table 4. Percentage of Students at Green Level in SAT by Free/Reduced Lunch Status

Grade Level	SY2019							
	EBRW				Math			
	Free/Reduced Lunch		All Others		Free/Reduced Lunch		All Others	
	N	% Green	N	% Green	N	% Green	N	% Green
9th Grade	143	62.9	885	88.7	143	52.4	885	81.4
10th Grade	149	51.0	982	82.1	149	34.9	982	63.4
11th Grade	134	56.7	929	87.3	134	43.3	929	76.9
Grade Level	SY2021							
	EBRW				Math			
	Free/Reduced Lunch		All Others		Free/Reduced Lunch		All Others	
	N	% Green	N	% Green	N	% Green	N	% Green
9th Grade	125	44.0	757	72.1	125	40.0	757	71.2

10th Grade	100	72.0	798	89.0	100	58.0	798	77.7
11th Grade	114	59.6	889	86.2	114	31.6	889	69.1
Statistically Significant Disparity ($p > 0.05$)								

Achievement gap in SAT: Gender Disparities

The assessment results by gender significantly varied by subject in opposite ways: EBRW had shown a significant gap favoring female students, while similar gaps in math favored male students (Table 5).

In EBRW, significant gender disparities were found in 9th grade for both SY2019 and SY2020 and in 10th grade for SY2019. In all cases, female students were far more likely to reach the green level than male students. According to the results from logistic regression, female students in 9th grade were 70.6% more likely to reach the green level than male students during SY2019. The same trend continued in SY2021 as the 9th grade female students were 39% more likely to reach the green level. While the disparity was slightly more intense for 10th grade female students (84% more likely than male students) in SY2019, the gap was not significant for the 10th grade cohort during SY2021.

Conversely, in math, female students in 11th grade during SY2019 were 36.8% less likely to reach green level compared to male students, while during SY2021, 9th and 10th grade female students were likely to reach green level by 34.9% and 30.6%, respectively.

Table 5. Percentage of Students at Green Level in SAT by Gender

Grade Level	SY2019							
	EBRW				Math			
	Female		Male		Female		Male	
	N	% Green	N	% Green	N	% Green	N	% Green
9th Grade	524	88.5	504	81.5	524	77.7	504	77.0
10th Grade	513	84.6	618	72.5	513	60.0	618	59.4
11th Grade	504	87.7	559	79.6	504	71.8	559	73.3
Grade Level	SY2021							
	EBRW				Math			
	Female		Male		Female		Male	
	N	% Green	N	% Green	N	% Green	N	% Green

Grade Level	N	% Green						
9th Grade	429	73.4	453	63.1	429	65.5	453	68.0
10th Grade	449	88.2	449	86.0	449	72.6	449	78.4
11th Grade	525	85.3	478	80.8	525	63.4	478	66.3
Statistically Significant Disparity (p>0.05)								

Additional Findings in SAT

Students who are English learners or have IDEA status were far less likely to reach the green level for both subjects in both school years. Mobility impacted only 10th grade students for both years, as those who experienced at least one transfer during a given school year were less likely to reach green level compared to those who remained stable with one school.

For SY2021, those students who received at least 50% of instruction through remote instruction were significantly more likely to reach the green level than other instruction modes.

IAR

Achievement gap in IAR: Disparities by Race/Ethnicity

The patterns of achievement by race/ethnicity among 3rd through 8th grades are quite different from those found among 9th and 11th grades in that there are fewer significant gaps between white and Hispanic students. For black students, 4th and 8th grades during SY2019 and all grade levels except 8th grade during SY2021 had too few students in each grade level to determine statistical significance. However, as was the case in SAT math during SY2021, Asian students consistently outperformed white students in a number of grade levels to exacerbate the achievement gaps across racial/ethnic groups. For example, the gaps were particularly glaring in math, in which 81.4% of 5th grade Asian students met or exceeded expectations during SY2019, whereas 19.7% of Hispanic students had done the same.

Table 6. Percentage of Students who Met or Exceeded Expectations in IAR by Race/Ethnicity

	SY2019							
	EBRW				Math			
	White	Hispanic	Asian	Black	White	Hispanic	Asian	Black

Grade Level	N	% M/E														
3rd Grade	587	50.3	102	32.4	71	63.4	10	40.0	587	60.0	102	40.2	71	81.7	10	50.0
4th Grade	559	60.8	107	40.2	59	71.2	M		559	62.4	107	41.1	59	79.7	M	
5th Grade	615	65.5	122	36.9	59	84.7	16	18.8	615	55.1	122	19.7	59	81.4	16	31.3
6th Grade	702	71.4	87	49.4	67	80.6	21	47.6	702	50.7	87	34.5	67	67.2	21	4.8
7th Grade	683	75.1	114	59.6	65	86.2	16	62.5	682	59.4	114	40.4	65	83.1	16	43.8
8th Grade	753	72.6	126	58.7	63	88.9	M		753	64.1	126	42.1	63	79.4	M	
SY2021																
EBRW																
Math																
White Hispanic Asian Black White Hispanic Asian Black																
Grade Level	N	% M/E														
3rd Grade	492	52.6	74	31.1	30	46.7	M		492	59.8	74	37.8	30	66.7	M	
4th Grade	546	50.7	77	29.9	45	66.7	M		546	55.5	77	29.9	45	60.0	M	
5th Grade	534	58.2	81	38.3	60	66.7	M		534	55.1	81	33.3	60	66.7	M	
6th Grade	498	49.0	99	29.3	45	71.1	M		498	44.8	99	32.3	45	75.6	M	
7th Grade	475	52.2	91	19.8	53	71.7	M		470	49.4	90	12.2	52	65.4	M	
8th Grade	575	57.9	70	37.1	59	71.2	16	31.3	575	52.5	70	28.6	59	71.2	16	25.0

Statistically Significant Disparity (p>0.05)

M = Fewer than 10 students

Achievement gap in IAR: Disparities by Free/Reduced Lunch status

IAR results were similar to the results of the SAT. Significant gaps were identified in most grade levels for the students with free/reduced lunch status. (Table 7). The gaps are particularly glaring in math for both school years. The achievement gaps in math for 3rd grade are particularly alarming and imply that this disparity may be found even in early childhood as indicated by research (Fateel, Mukallid, & Arora, 2021; Lurie et al., 2021).

Table 7. Percentage of Students who Met or Exceeded Expectations in IAR by Free/Reduced Lunch Status

Grade Level	SY2019							
	EBRW				Math			
	Free/Reduced Lunch		All Others		Free/Reduced Lunch		All Others	
	N	% M/E	N	% M/E	N	% M/E	N	% M/E
3rd Grade	123	26.8	649	53.0	123	29.3	649	64.9
4th Grade	114	36.8	626	62.0	114	32.5	626	65.3
5th Grade	128	34.4	688	66.6	128	18.8	688	57.1
6th Grade	138	47.1	741	73.4	137	24.8	742	53.6
7th Grade	146	51.4	766	78.2	146	26.0	765	64.6
8th Grade	137	46.7	815	76.1	137	31.4	814	67.3
Grade Level	SY2021							
	EBRW				Math			
	Free/Reduced Lunch		All Others		Free/Reduced Lunch		All Others	
	N	% M/E	N	% M/E	N	% M/E	N	% M/E
3rd Grade	91	31.9	516	52.5	92	31.5	516	61.6
4th Grade	87	32.2	591	51.8	89	28.1	591	55.8
5th Grade	95	31.6	591	60.7	96	27.1	592	57.6
6th Grade	91	26.4	571	50.4	93	22.6	565	48.1
7th Grade	85	24.7	565	52.7	84	13.1	559	49.7
8th Grade	93	35.5	636	58.8	91	27.5	630	54.4

Statistically Significant Disparity (p>0.05)

Achievement gap in IAR: Gender Disparities

Similar to SAT, the assessment results by gender significantly varied by subject: ELA/L had shown a significant gap favoring female students, while similar gaps in math favored male students (Table 8).

Table 8. Percentage of Students who Met or Exceeded Expectations in IAR by Gender

Grade Level	SY2019							
	EBRW				Math			
	Female		Male		Female		Male	
	N	% M/E	N	% M/E	N	% M/E	N	% M/E
3rd Grade	394	54.1	378	43.4	394	55.8	378	62.7
4th Grade	369	64.8	371	51.5	369	57.7	371	62.8
5th Grade	394	68.5	421	55.1	394	49.0	421	53.0
6th Grade	429	76.0	449	63.0	429	47.3	449	51.0
7th Grade	437	83.1	475	65.5	436	57.1	475	59.6
8th Grade	474	79.7	475	64.2	474	62.0	475	62.5
Grade Level	SY2021							
	EBRW				Math			
	Female		Male		Female		Male	
	N	% M/E	N	% M/E	N	% M/E	N	% M/E
3rd Grade	295	55.3	311	44.1	295	52.2	311	61.7
4th Grade	342	55.6	335	43.0	342	48.8	335	56.1
5th Grade	350	64.3	333	48.9	350	50.6	333	57.1
6th Grade	316	56.6	340	39.1	316	44.0	340	45.3
7th Grade	311	57.9	339	41.0	306	42.8	337	46.9
8th Grade	335	64.8	386	49.0	335	53.4	386	49.0

Statistically Significant Disparity ($p > 0.05$)

Additional Findings in IAR

Identical to SAT, those students who are English learners or have IDEA status were far less likely to reach the green level for both subjects in both school years. The composition of EL students will increasingly be complex, as indicated by the number of native languages represented. While two-thirds of EL students speak Spanish, at least 42 other languages were represented in both school years.

Mobility only impacted 5th grade students for SY2021, as those students who experienced at least one transfer during a given school year were less likely to reach green level compared to those who remained stable with one school.

The impact of remote instruction was significant for 8th grade students in math during SY2021. However, unlike high school students, those who received more than 50% of instruction remotely were less likely to meet or exceed expectations.

Recommendations

Resource Allocation

Achievement gaps have been a topic of national dialogue. While their [root causes and interventions have been intensely debated for the past 80 years](#), [little progress](#) has been made during the same period. At the same time, such external factors as social, economic, and demographic changes significantly impact educational systems and respond to the accompanying growth in the diversity of student enrollment (Anisef & Kilbride, 2004).

The achievement gaps among Hispanic students in the district have been identified. While there has been a steady decline in white students, the proportion of Hispanic and Asian students has increased (Figure 1). Given this recent trend in the incremental shift in student composition, the achievement gap experienced by Hispanic students merits an immediate intervention.

A number of researchers have argued that racial achievement gaps have their roots in socioeconomic phenomena and, therefore, recommended financial solutions to address that gap (Chideya, 1995; Rothstein, 2004). Given the varying composition of students by race/ethnicity, socioeconomic status, and intimate relationships, a differentiation in resource allocation across the district would be crucial to addressing the issue.

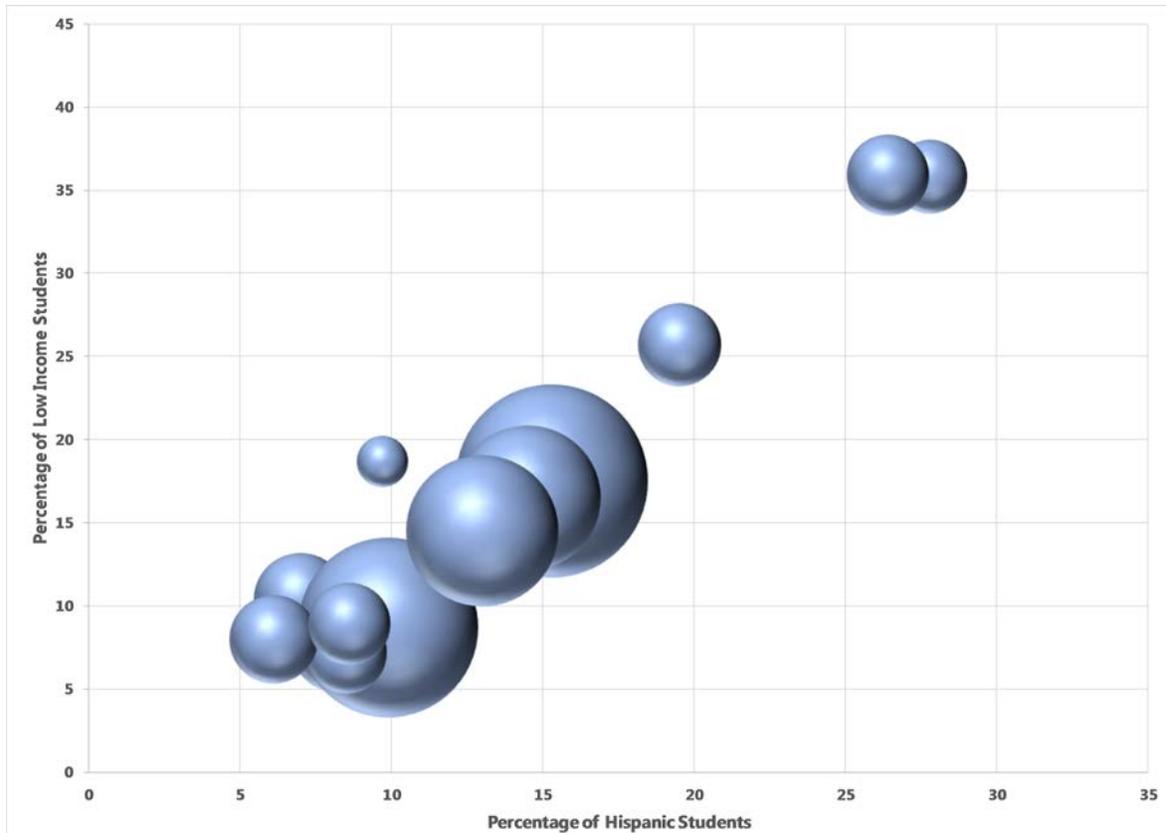
In St. Charles CUSD 303, Hispanic students are overrepresented in the low-income group compared to all other racial/ethnic groups, a trend found in other districts around the country (Lichter, Qian, & Crowley, 2005). Subsequently, more Hispanic students tend to be present in those schools with a higher percentage of low-income students. However, two important points must be made about the relationship between the presence of Hispanic students and the students from low-income families. First, the recent increase in enrollment of Hispanic students (Figure 1) does not necessarily lead to an increased number of low-income students, given that the proportion of the latter group has remained stable (Figure 2). Second, the additional analysis indicated that the academic performance of Hispanic students who receive free/reduced lunch is not significantly different from those of other students, which implies that the challenges faced by Hispanic students are not necessarily distinct from those faced by low-income students. That is, a greater investment of resources in schools like [Richmond Intermediate School](#), where over a quarter of its students are Hispanic (26.4%), and over a third of its student population are considered to be from low-income households (35.9%), would likely to begin the path toward addressing the issues of equity.

Staff Development

Research suggests that the academic performance of minority students is significantly impacted by the presence of teachers with the same racial background. Given [the composition of teachers in the district](#), there is an increasing difference from its student composition and will increasingly be so. Resource allocation would need to include training on culturally responsive approaches and the degrees to which implicit bias plays a role in practice. Incorporating these elements would impact Hispanic students and many other students contributing to the diversity as indicated by the number of native languages represented among English learners in the district.

A culturally responsive approach to teaching is to gain an understanding of norms, beliefs, and behaviors that can empower students with different backgrounds to find their way out of the existing achievement gap (Hammond, 2014). Implementing this approach would also involve reflection among staff about bias in interactions. Many studies have indicated that differentiated treatment and perception of students by their characteristics, whether race/ethnicity (Reardon & Galindo, 2009) or gender (Terrier, 2020), have a significant impact on their academic performances.

Figure 3: Relationship between Percentage of Hispanic Students and Percentage of Low-Income Students by School



Conclusion

The achievement gap in St. Charles CUSD 303 parallels the trends found across the nation, particularly Hispanic-white, economic background, and gender gaps and their patterns (Reardon, Fahle, Kalogrides, Podolsky, & Zárate, 2019; Reardon & Galindo, 2009). At the district level, it would be important to consider two main areas: 1) targeted support to identify those students and schools that are most vulnerable to achievement gaps; 2) staff development that is relevant to practices that can alleviate achievement gaps.

Statement of Independence and Integrity

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Chapin Hall partners with policymakers, practitioners, and philanthropists at the forefront of research and policy development by applying a unique blend of scientific research, real-world experience, and policy expertise to construct actionable information, practical tools, and, ultimately, positive change for children and families.

Established in 1985, Chapin Hall's areas of research include child welfare systems, community capacity to support children and families, and youth homelessness. For more information about Chapin Hall, visit www.chapinhall.org.

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Appendices

The odds ratio calculated for each student characteristic is interpreted as the event (reaching green in SAT or meeting or exceeding expectations in IAR) likely to occur compared to the reference group expressed in percent. For example, the odds ratio of 1.70 for female students in 9th grade EBRW indicates that they are 70% more likely to reach green compared to male students. Conversely, the odds ratio of 0.642 for female students in 9th grade math indicates that they are 36.8% less likely to reach green compared to male students.

Appendix A. Logistic Regression Results for EBRW in SAT

Category	Variable	2019						2021											
		9th Grade			10th Grade			9th Grade			10th Grade								
		Odds Ratio	Std. Err.	z	P>z	[95% conf. interval]	Odds Ratio	Std. Err.	z	P>z	[95% conf. interval]	Odds Ratio	Std. Err.	z	P>z	[95% conf. interval]			
Demographic	female	1.706	0.356	2.560	0.010	1.134	2.567	1.840	0.320	3.510	0.000	1.309	2.587	1.344	0.271	1.470	0.143	0.905	1.994
	Hispanic	0.449	0.132	-2.720	0.006	0.253	0.799	0.480	0.127	-2.780	0.005	0.287	0.805	0.264	0.074	-4.730	0.000	0.152	0.458
	AIAN	1.000	(omitted)					1.527	1.329	0.490	0.627	0.277	8.409	0.187	0.230	-1.360	0.174	0.017	2.096
	Asian	1.697	0.955	0.940	0.347	0.563	5.114	0.844	0.293	-0.490	0.626	0.428	1.667	2.021	1.231	1.160	0.248	0.613	6.666
	Black	0.743	0.625	-0.350	0.724	0.143	3.865	0.195	0.106	-2.990	0.003	0.067	0.568	0.186	0.121	-2.590	0.010	0.052	0.664
	NHPI	1.000	(omitted)					1.000	(omitted)					1.000	(omitted)				
Economic	Mult	1.140	0.766	0.200	0.845	0.305	4.256	2.727	2.175	1.260	0.208	0.571	13.023	0.672	0.405	-0.660	0.510	0.206	2.191
	Homeless	1.439	1.405	0.370	0.710	0.212	9.750	1.711	2.156	0.430	0.670	0.145	20.204	0.556	0.597	-0.550	0.585	0.068	4.554
	Free/Reduced Lunch	0.343	0.094	-3.910	0.000	0.201	0.587	0.406	0.098	-3.720	0.000	0.253	0.653	0.473	0.127	-2.780	0.005	0.280	0.801
School Support	EL	0.056	0.047	-3.410	0.001	0.011	0.293	1.000	(omitted)					1.000	(omitted)				
	IDEA Status	0.080	0.021	-9.650	0.000	0.048	0.133	0.094	0.022	-10.230	0.000	0.060	0.148	0.092	0.025	-8.920	0.000	0.055	0.156
	School Enrolled	0.749	0.943	-0.230	0.819	0.064	8.835	0.311	0.131	-2.770	0.006	0.136	0.712	0.705	0.192	-1.290	0.199	0.414	1.201
Remote Instruction	1.000	(omitted)					1.000	(omitted)					1.000	(omitted)					
_cons		13.159	16.750	2.020	0.043	1.086	159.472	18.003	8.157	6.380	0.000	7.407	43.756	13.824	4.446	8.170	0.000	7.360	25.965
Demographic	female	1.390	0.224	2.040	0.041	1.013	1.906	1.285	0.300	1.070	0.284	0.813	2.032	1.243	0.245	1.100	0.269	0.845	1.828
	Hispanic	0.663	0.168	-1.630	0.104	0.404	1.088	0.625	0.196	-1.500	0.135	0.338	1.157	0.246	0.064	-5.360	0.000	0.147	0.411
	AIAN	1.589	1.802	0.410	0.683	0.172	14.669	1.000	(omitted)					0.181	0.224	-1.380	0.166	0.016	2.033
	Asian	2.006	0.703	1.990	0.047	1.010	3.985	3.266	2.311	1.670	0.094	0.816	13.074	1.052	0.480	0.110	0.911	0.430	2.575
	Black	0.526	0.291	-1.160	0.246	0.178	1.557	1.000	(omitted)					0.169	0.115	-2.610	0.009	0.044	0.643
	NHPI	1.000	(omitted)					1.000	(omitted)					1.000	(omitted)				
Economic	Mult	2.801	1.534	1.880	0.060	0.957	8.196	1.112	0.733	0.160	0.872	0.305	4.046	1.358	0.955	0.430	0.664	0.342	5.393
	Homeless	1.000	(omitted)					0.134	0.171	-1.570	0.116	0.011	1.644	0.719	0.911	-0.260	0.795	0.060	8.623
	Free/Reduced Lunch	0.535	0.129	-2.590	0.010	0.333	0.860	0.507	0.165	-2.080	0.037	0.267	0.961	0.490	0.136	-2.560	0.010	0.284	0.845
School Support	EL	0.195	0.131	-2.420	0.015	0.052	0.732	0.290	0.205	-1.750	0.080	0.073	1.158	0.057	0.062	-2.650	0.008	0.007	0.474
	IDEA Status	0.251	0.067	-5.210	0.000	0.149	0.422	0.075	0.021	-9.090	0.000	0.043	0.131	0.093	0.026	-8.400	0.000	0.054	0.162
	School Enrolled	1.000	(omitted)					0.188	0.138	-2.270	0.023	0.045	0.794	1.548	0.574	1.180	0.239	0.748	3.203
Remote Instruction	5.393	2.301	3.950	0.000	2.337	12.447	1.973	0.892	1.500	0.133	0.813	4.787	2.360	0.834	2.430	0.015	1.181	4.716	
_cons		0.510	0.222	-1.550	0.122	0.217	1.196	32.779	31.731	3.600	0.000	4.916	218.574	2.618	1.524	1.650	0.098	0.836	8.194

Appendix B. Logistic Regression Results for Math in SAT

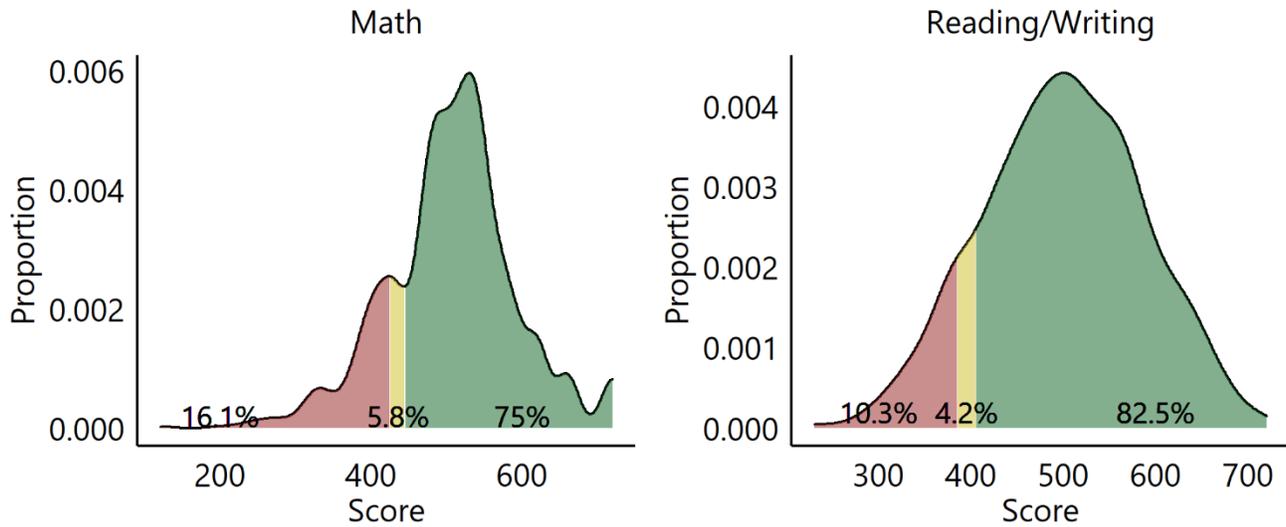
Category	Variable	2019						2021											
		9th Grade			10th Grade			9th Grade			10th Grade			11th Grade					
		Odds Ratio	Std. Err.	z	P>z	[95% conf. interval]	Odds Ratio	Std. Err.	z	P>z	[95% conf. interval]	Odds Ratio	Std. Err.	z	P>z	[95% conf. interval]			
Demographic	female	0.888	0.153	-0.690	0.491	1.244	0.820	0.110	-1.470	0.141	0.630	1.068	0.642	0.102	-2.780	0.005	0.470	0.877	
	Hispanic	0.364	0.093	-3.960	0.000	0.221	0.600	0.142	-2.160	0.031	0.375	0.953	0.304	0.077	-4.710	0.000	0.185	0.498	
	AIAN	1.220	1.712	0.140	0.887	0.078	19.070	0.994	0.790	-0.010	0.994	0.210	4.715	0.408	0.504	-0.730	0.468	0.036	4.595
	Asian	1.273	0.512	0.600	0.548	0.579	2.799	1.896	0.578	2.100	0.036	1.043	3.446	1.464	0.542	1.030	0.304	0.708	3.024
	Black	0.602	0.436	-0.700	0.484	0.146	2.488	0.251	0.153	-2.270	0.023	0.076	0.828	0.204	0.139	-2.330	0.020	0.054	0.775
	NHPI	1.000	(omitted)				1.000	(omitted)					1.000	(omitted)					
	Mult	0.776	0.415	-0.470	0.635	0.272	2.211	1.597	0.770	0.970	0.332	0.620	4.110	1.595	0.930	0.800	0.424	0.508	5.002
Economic	Homeless	0.725	0.715	-0.330	0.744	0.105	5.007	0.856	1.101	-0.120	0.904	0.069	10.637	1.000	(omitted)				
	Free/Reduced Lunch	0.420	0.101	-3.620	0.000	0.262	0.672	0.494	0.109	-3.200	0.001	0.320	0.761	0.490	0.117	-3.000	0.003	0.308	0.781
	EL	0.325	0.227	-1.610	0.108	0.082	1.279	0.249	0.272	-1.270	0.203	0.029	2.123	0.106	0.121	-1.960	0.050	0.011	0.996
School Support	IDEA Status	0.065	0.018	-9.930	0.000	0.038	0.111	0.066	0.020	-8.850	0.000	0.036	0.120	0.097	0.027	-8.370	0.000	0.056	0.167
	School Enrolled	1.457	1.822	0.300	0.764	0.126	16.902	0.372	0.167	-2.200	0.028	0.154	0.898	0.560	0.172	-1.890	0.059	0.306	1.023
	Remote Instruction	1.000	(omitted)				1.000	(omitted)					1.000	(omitted)					
_cons	4.800	6.051	1.240	0.213	0.406	56.797	6.561	3.093	3.990	0.000	2.604	16.527	10.213	3.514	6.750	0.000	5.203	20.046	
Demographic	female	0.651	0.106	-2.650	0.008	0.474	0.895	0.694	0.119	-2.130	0.033	0.496	0.971	0.756	0.115	-1.840	0.066	0.561	1.018
	Hispanic	0.949	0.247	-0.200	0.841	0.570	1.580	0.656	0.161	-1.710	0.086	0.405	1.062	0.290	0.070	-5.150	0.000	0.181	0.464
	AIAN	0.510	0.477	-0.720	0.472	0.082	3.190	1.000	(omitted)					0.162	0.200	-1.480	0.139	0.015	1.808
	Asian	2.005	0.688	2.030	0.043	1.023	3.929	2.923	1.351	2.320	0.020	1.181	7.232	2.102	0.792	1.970	0.049	1.004	4.400
	Black	0.687	0.386	-0.670	0.504	0.229	2.064	0.652	0.766	-0.360	0.716	0.065	6.530	0.346	0.229	-1.600	0.109	0.095	1.267
	NHPI	1.000	(omitted)				1.000	(omitted)						1.000	(omitted)				
	Mult	1.651	0.811	1.020	0.307	0.630	4.326	0.853	0.373	-0.360	0.716	0.362	2.010	1.306	0.668	0.520	0.601	0.479	3.559
	Homeless	1.095	1.302	0.080	0.939	0.106	11.265	0.412	0.512	-0.710	0.476	0.036	4.714	3.923	5.535	0.970	0.333	0.247	62.331
	Free/Reduced Lunch	0.397	0.096	-3.810	0.000	0.246	0.638	0.593	0.157	-1.970	0.048	0.352	0.997	0.328	0.081	-4.490	0.000	0.202	0.534
	EL	0.168	0.113	-2.660	0.008	0.045	0.626	0.272	0.189	-1.880	0.060	0.070	1.059	1.000	(omitted)				
	IDEA Status	0.155	0.043	-6.740	0.000	0.090	0.266	0.102	0.029	-7.970	0.000	0.058	0.179	0.059	0.022	-7.560	0.000	0.028	0.122
	School Enrolled	1.000	(omitted)					1.125	0.874	0.150	0.880	0.245	5.162	0.769	0.235	-0.860	0.389	0.423	1.398
	Remote Instruction	4.334	1.811	3.510	0.000	1.910	9.833	1.080	0.471	0.180	0.859	0.459	2.540	2.491	0.862	2.640	0.008	1.264	4.908
_cons	0.899	0.382	-0.250	0.801	0.390	2.068	4.469	4.349	1.540	0.124	0.663	30.099	1.935	1.019	1.250	0.210	0.689	5.432	

Appendix D. Logistic Regression Results for Math in IAR

Category	Variable	3rd Grade					4th Grade					5th Grade					6th Grade					7th Grade					8th Grade												
		Odds Ratio	Std. Err.	z	P > z	95% conf.intervall	Odds Ratio	Std. Err.	z	P > z	95% conf.intervall	Odds Ratio	Std. Err.	z	P > z	95% conf.intervall	Odds Ratio	Std. Err.	z	P > z	95% conf.intervall	Odds Ratio	Std. Err.	z	P > z	95% conf.intervall	Odds Ratio	Std. Err.	z	P > z	95% conf.intervall								
Demographic	Female	0.603	0.101	-3.040	0.002	0.435	0.836	0.111	-3.080	0.001	0.458	0.903	0.819	0.128	-1.270	0.203	0.603	1.114	0.709	1.055	-2.320	0.020	0.531	0.948	0.776	0.116	-1.690	0.091	0.579	1.042	0.905	0.137	0.660	0.511	0.672	1.219			
	Hispanic	0.866	0.233	-0.540	0.592	0.511	1.467	0.906	0.251	-0.360	0.721	0.526	1.558	0.496	0.140	-2.490	0.013	0.285	0.862	0.849	0.233	-0.600	0.550	0.495	1.454	1.112	0.291	0.410	0.684	0.667	1.856	0.737	0.176	-1.280	0.200	0.463	1.176		
	AIAN	1.000	(limited)			0.449	0.441	-0.810	0.415	0.065	3.087	1.000	(limited)			1.000	(limited)			1.000	(limited)			0.678	0.624	-0.420	0.673	0.112	4.112	1.000	(limited)			1.000	(limited)				
	Asian	3.450	1.261	-3.390	0.001	1.685	7.062	3.379	1.341	3.070	0.002	1.552	7.357	3.940	1.460	3.700	0.000	1.906	8.146	2.662	0.833	3.130	0.002	1.441	4.916	3.329	1.203	3.330	0.001	1.640	6.761	2.329	0.858	2.290	0.022	1.131	4.793		
	Black	0.781	0.545	-0.350	0.723	0.199	3.067	0.695	0.534	-0.470	0.636	0.154	3.136	0.435	0.249	-1.450	0.446	1.42	1.316	0.050	0.952	-2.890	0.004	0.007	0.381	0.765	0.441	-0.470	0.642	0.247	2.365	0.938	0.790	0.080	0.940	0.180	4.886		
Economic	NHPI	1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)
	Homeless	1.000	(limited)			0.332	1.741	11.662	10.551	-0.108	0.139	-1.720	0.085	1.009	1.355	0.851	0.392	-0.350	0.726	3.346	2.097	0.821	-0.328	-0.490	0.621	0.751	1.796	1.496	0.661	0.910	0.362	0.629	3.556	1.118	0.491	0.250	0.799	0.473	2.646
	Free/Reduced Lunch	0.450	0.113	-3.170	0.002	0.275	0.737	0.480	0.134	-2.630	0.008	0.278	0.828	0.324	0.089	-0.860	0.000	0.189	0.571	0.424	0.102	-3.570	0.000	0.364	0.703	0.259	0.061	-5.690	0.000	0.162	0.412	0.335	0.079	-4.630	0.000	0.211	0.532		
	EL	0.206	0.070	-4.660	0.000	0.106	0.400	0.235	0.083	-4.110	0.000	0.118	0.469	0.064	0.049	-3.630	0.000	0.015	0.283	0.081	0.063	-3.220	0.001	0.018	0.374	0.076	0.061	-3.200	0.001	0.015	0.368	1.000	(limited)			1.000	(limited)		
	School Status	0.167	0.045	-6.680	0.000	0.099	0.283	0.105	0.031	-7.770	0.000	0.060	0.186	0.191	0.055	-5.760	0.000	0.109	0.336	0.137	0.049	-5.600	0.000	0.068	0.274	1.566	1.966	0.360	0.721	0.134	18.346	1.000	(limited)			1.000	(limited)		
School Support	School Enrolled	1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)
	Remote Instruction	1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)
	LCars	3.007	0.425	7.290	0.000	2.280	3.968	3.037	0.422	7.890	0.000	2.293	3.969	1.810	0.215	-4.990	0.000	1.433	2.895	1.622	0.184	4.260	0.000	1.299	2.027	1.487	1.876	0.310	0.753	17.658	2.782	0.327	8.700	0.000	2.209	3.503			
Demographic	Female	0.502	0.096	-3.990	0.000	0.345	0.731	0.591	1.011	-3.080	0.001	0.423	0.826	0.985	0.102	-3.080	0.002	0.415	0.823	0.857	1.047	-0.890	0.371	0.632	1.201	0.764	0.134	-1.540	0.123	0.542	1.076	0.921	0.152	0.500	0.616	0.667	1.271		
	Hispanic	0.698	0.221	-1.140	0.256	0.375	1.298	0.621	0.193	-1.530	0.128	0.338	1.143	0.729	0.217	-1.060	0.888	0.407	1.306	1.003	0.276	0.010	0.990	0.985	1.720	2.624	3.476	0.730	0.466	0.196	35.193	1.000	(limited)			1.000	(limited)		
	AIAN	1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			0.660	0.610	-0.450	0.653	0.108	4.042	2.624	3.476	0.730	0.466	0.196	35.193	1.000	(limited)			1.000	(limited)			1.000	(limited)
	Asian	2.393	1.218	-1.710	0.086	0.882	6.488	1.074	0.376	0.200	0.839	0.540	2.133	1.765	0.651	1.540	0.123	0.857	3.636	3.907	1.527	3.490	0.000	1.816	8.407	2.556	0.882	2.720	0.007	1.300	5.027	3.917	1.499	3.570	0.000	1.850	8.291		
	Black	0.686	0.553	-0.470	0.640	0.141	3.330	0.349	0.309	-1.190	0.235	0.062	1.980	7.232	8.212	1.740	0.081	0.781	66.959	0.759	0.696	-0.300	0.764	0.126	4.579	0.281	0.231	-1.540	0.123	0.056	1.410	0.314	0.189	-1.930	0.054	0.097	1.020		
Economic	NHPI	1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)
	Homeless	1.000	(limited)			0.249	1.185	9.921	0.392	-1.190	0.847	4.000	2.119	0.506	0.243	-1.420	0.156	0.197	1.298	1.421	0.683	0.730	0.465	0.554	3.645	1.014	0.502	0.030	0.977	0.385	2.676	0.458	0.199	-1.790	0.073	1.075			
	Free/Reduced Lunch	0.550	0.162	-2.930	0.043	0.309	0.980	0.746	0.228	-0.960	0.338	0.409	1.360	0.932	0.113	-3.260	0.001	0.223	0.689	0.356	0.121	-3.040	0.002	0.218	0.720	0.333	0.127	-2.870	0.004	0.157	0.705	0.535	0.153	-2.180	0.029	0.305	0.939		
	EL	0.223	0.087	-3.860	0.000	0.104	0.478	0.191	0.091	-3.470	0.001	0.075	0.486	0.031	0.032	-3.340	0.001	0.004	0.238	0.080	0.085	-2.370	0.018	0.010	0.643	0.163	0.178	-1.660	0.097	0.019	1.387	0.066	0.053	-3.370	0.001	0.014	0.322		
	IDEA Status	0.059	0.022	-7.500	0.000	0.028	0.125	0.110	0.038	-6.440	0.000	0.056	0.215	0.113	0.037	-6.620	0.000	0.059	0.215	0.078	0.037	-5.390	0.000	0.031	0.197	1.043	0.058	-4.820	0.000	0.065	0.316	0.449	0.054	-5.240	0.000	0.073	0.304		
School Support	School Enrolled	0.441	0.301	-1.200	0.231	0.116	1.683	0.122	0.135	-1.900	0.058	0.014	1.069	0.291	0.166	-2.160	0.031	0.095	0.893	1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)			1.000	(limited)		
	Remote Instruction	0.616	0.219	-1.370	0.172	0.307	1.235	1.364	0.477	0.890	0.375	0.687	2.707	0.842	0.290	-0.900	0.616	0.429	1.652	0.996	0.442	-0.010	0.992	0.417	2.378	0.461	0.187	-1.910	0.056	0.208	1.020	0.528	0.168	-2.000	0.048	0.280	0.966		
	LCars	8.276	5.878	2.860	0.003	2.057	33.296	18.341	20.624	2.590	0.010	2.024	166.183	8.597	5.197	3.560	0.000	2.629	38.112	1.167	0.153	1.170	0.241	0.902	1.509	1.415	0.187	2.630	0.009	1.092	1.832	1.611	0.201	3.820	0.000	1.265	2.058		

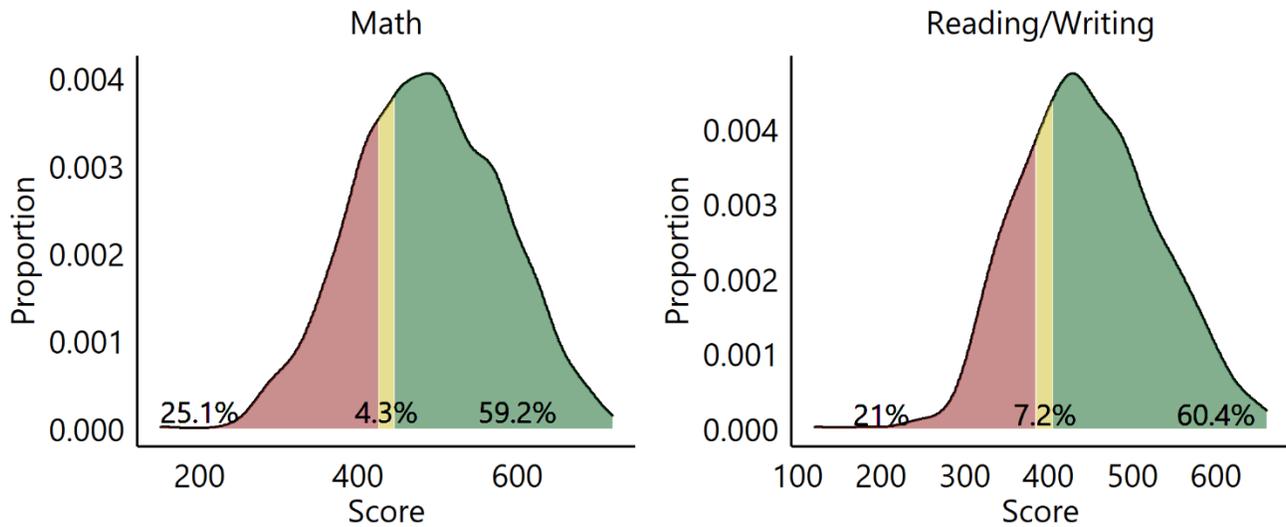
Appendix E. SAT Distributions for 9th Grade - 2019

Grade 9 Scores
(2019)



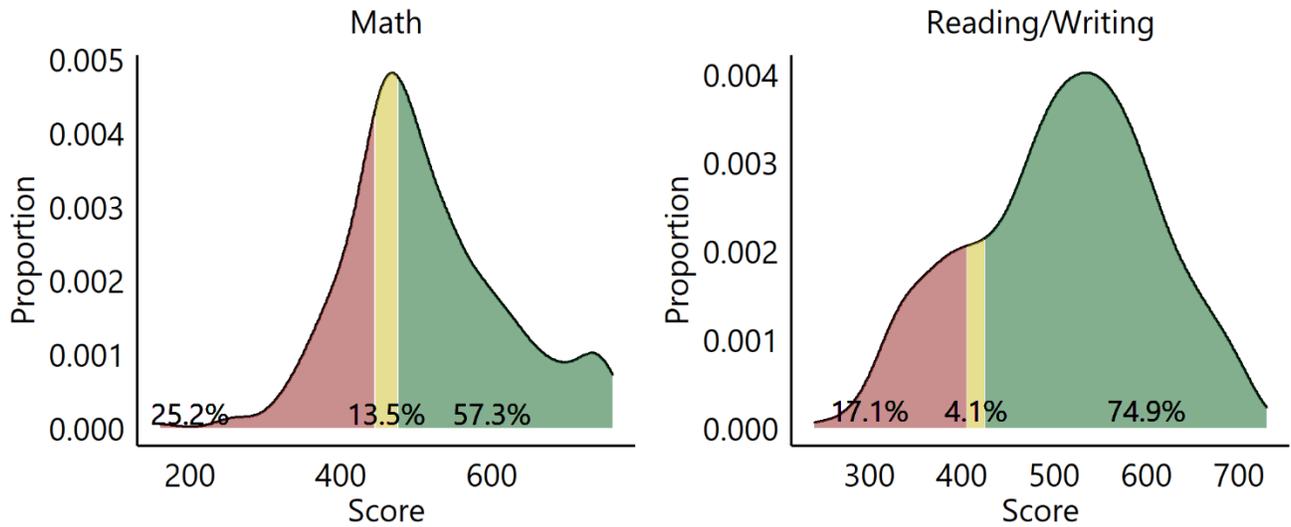
Appendix F. SAT Distribution for 9th Grade – 2021

Grade 9 Scores
(2021)



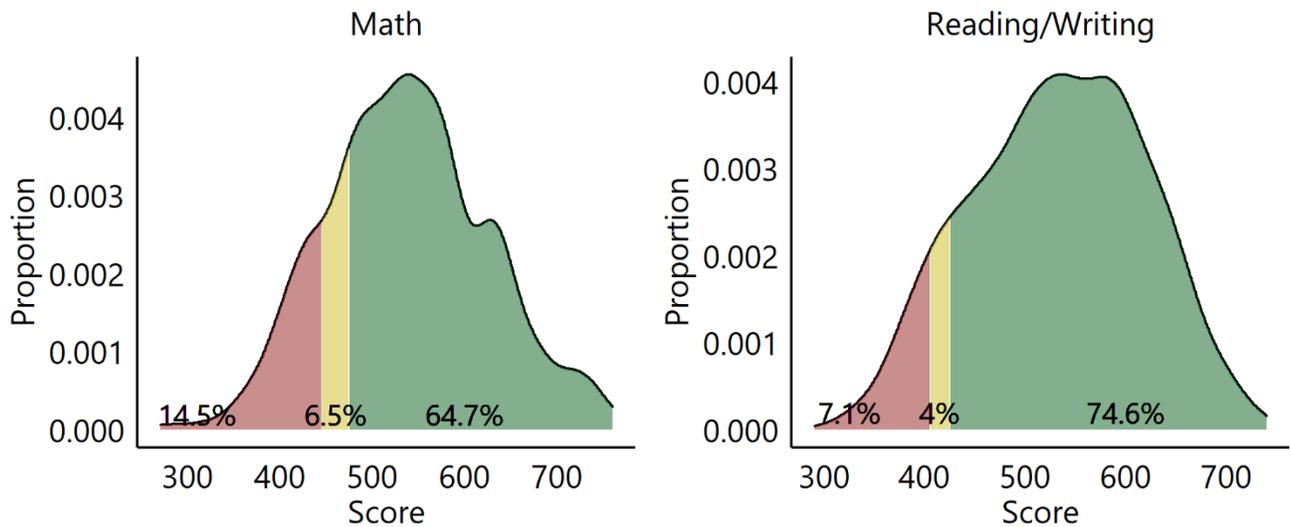
Appendix G. SAT Distribution for 10th Grade – 2019

Grade 10 Scores
(2019)



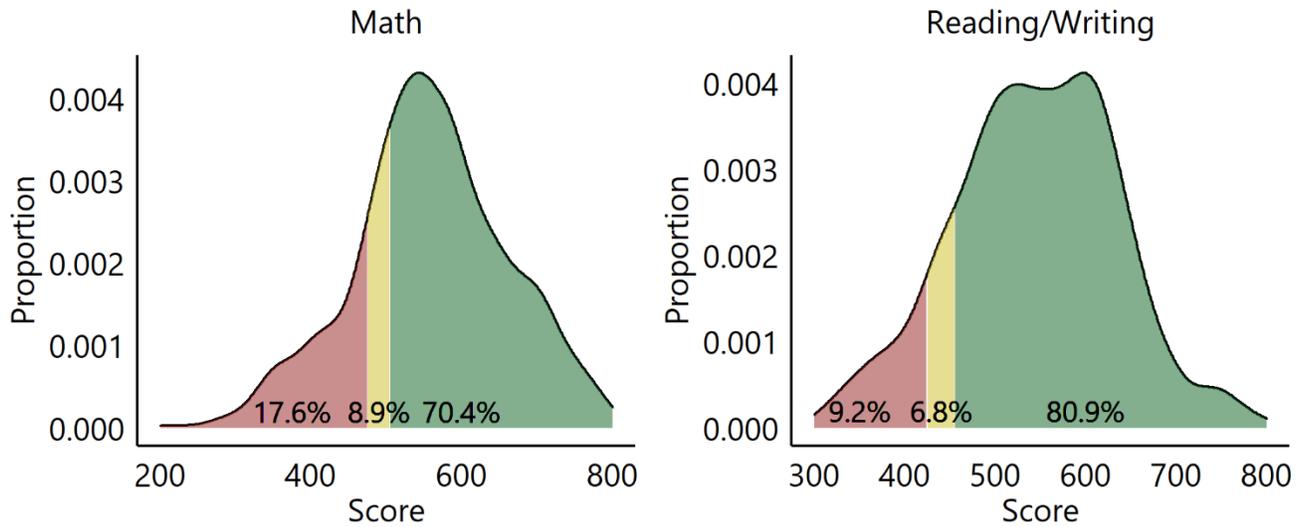
Appendix H. SAT Distribution for 10th Grade – 2021

Grade 10 Scores
(2021)



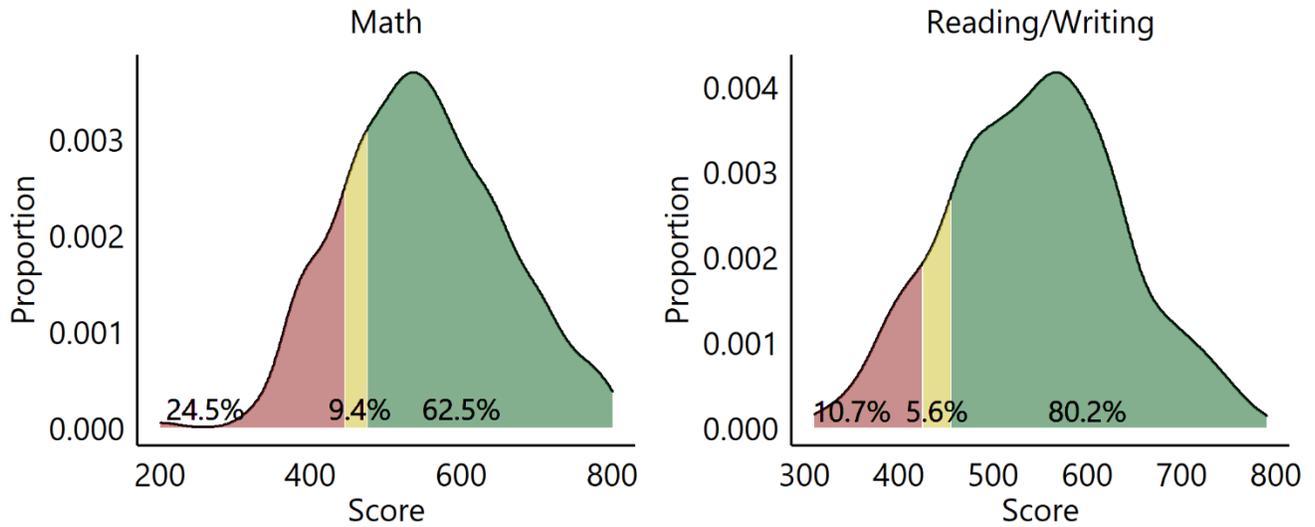
Appendix I. SAT Distribution for 11th Grade – 2019

Grade 11 Scores
(2019)



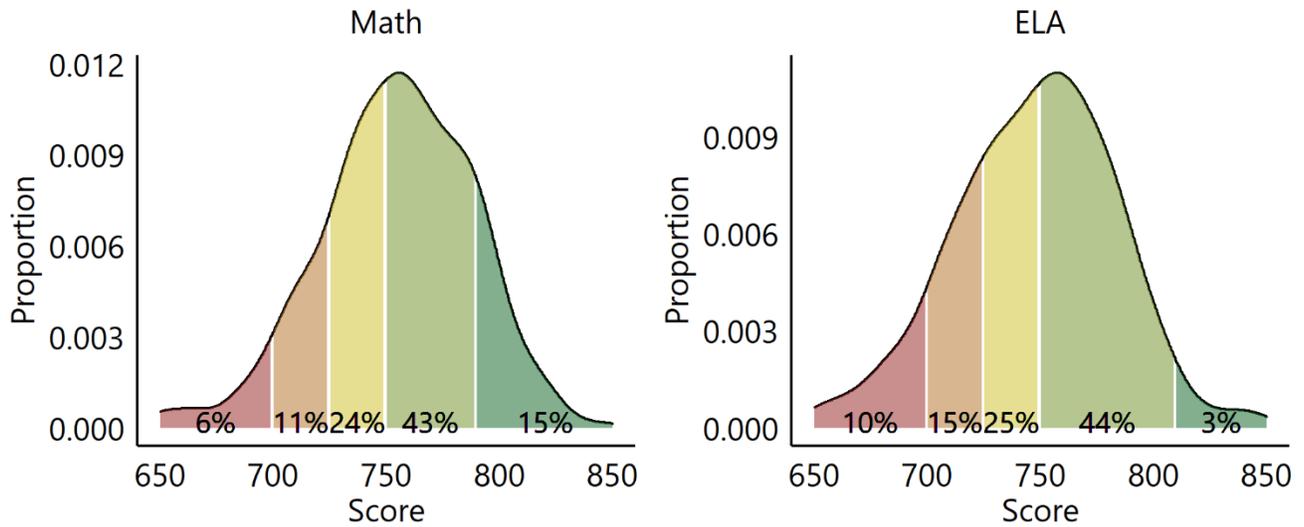
Appendix J. SAT Distribution for 11th Grade – 2021

Grade 11 Scores
(2021)



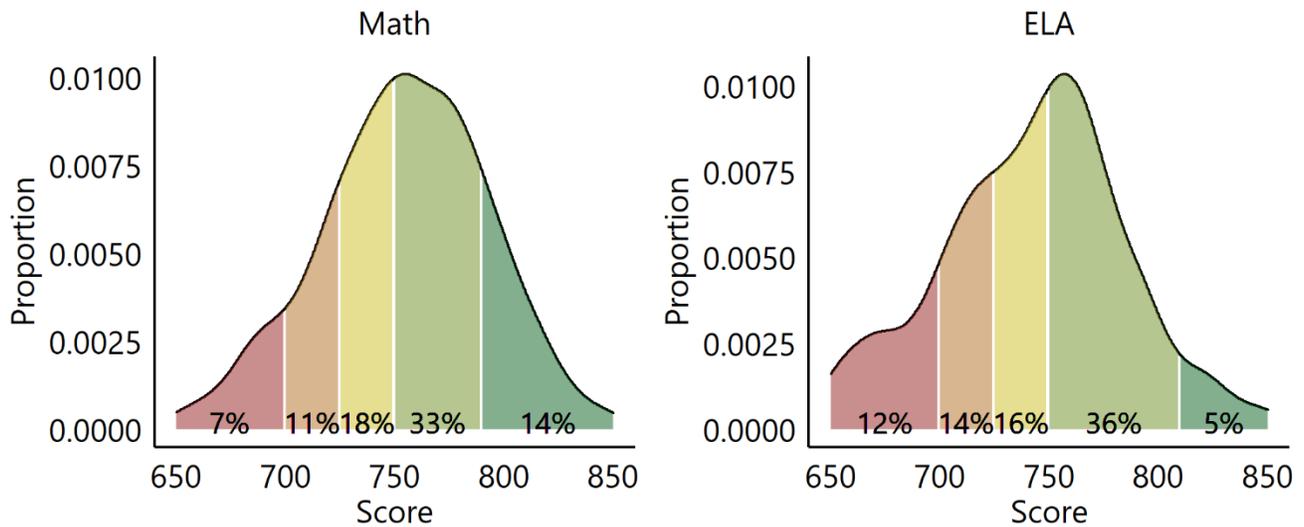
Appendix K. IAR Distribution for 3rd Grade – 2019

Grade 3 Scores
(2019)



Appendix L. IAR Distribution for 3rd Grade – 2021

Grade 3 Scores
(2021)



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