

2024 PSAT/SAT Growth & Cut-Score Methodology

Excerpt from September TAP Meeting

September 26, 2024

Content for Today's Presentation

- Summary of 2024 Growth & Prelim Framework Results
- Update on 1241 Stakeholder Taskforce
- Recap digital PSAT/SAT Implications for Accountability
- Changes for 2025 frameworks & Prep for 2025 Target Setting
- Public Comment



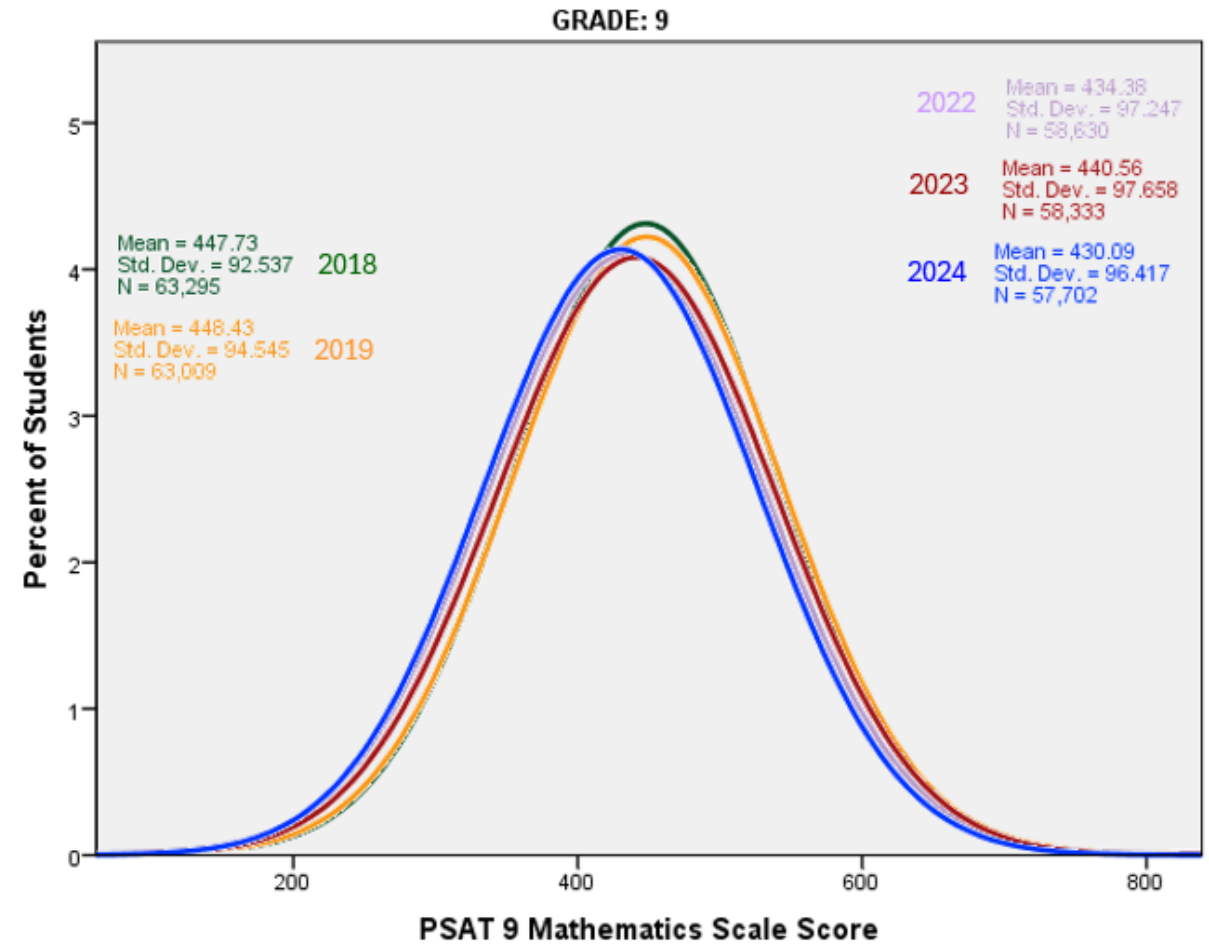
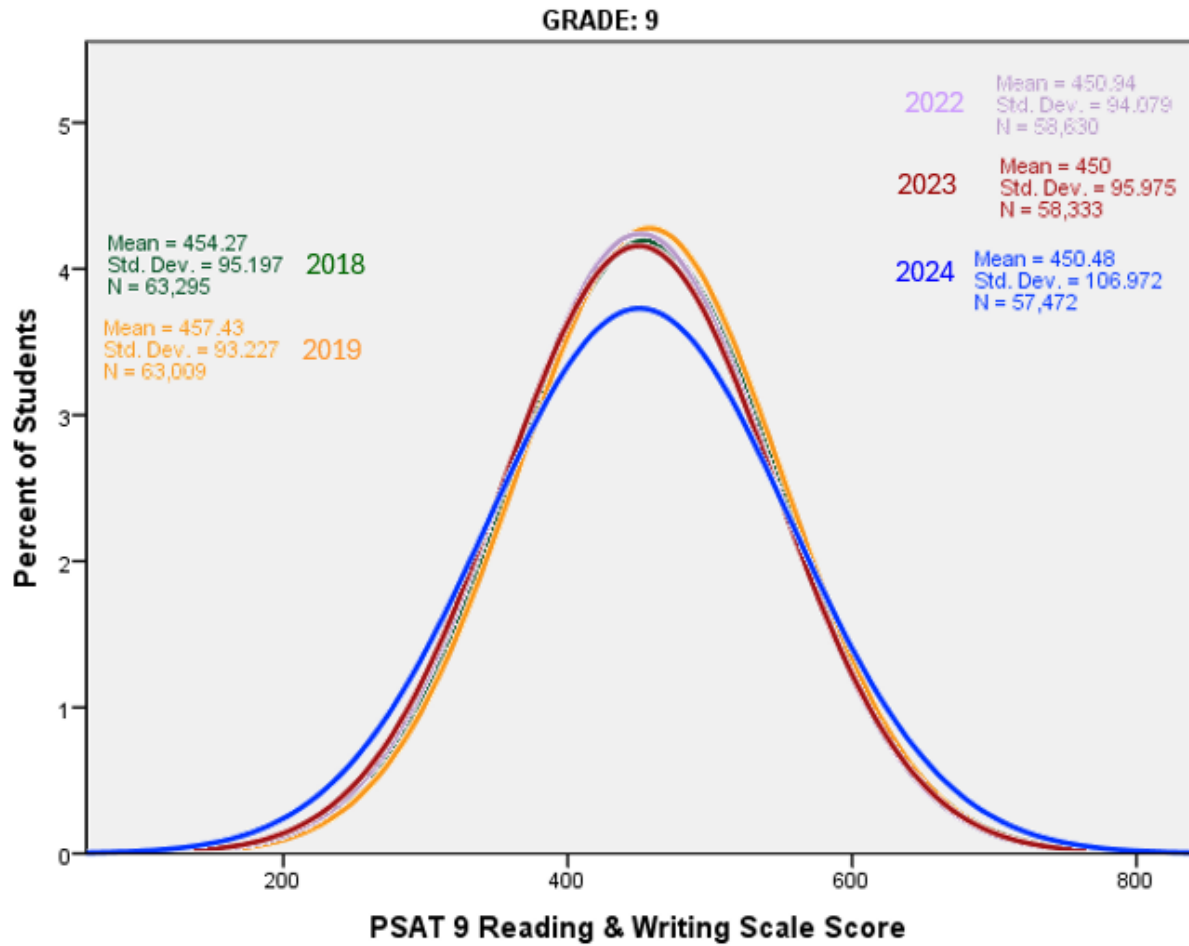
Implications of Transition to 2024 Digital PSAT/SAT for Growth

- 2024 growth for high schools examines progress between 2023 (paper-based version) and 2024 (digital version with new item types and different technical approaches) of PSAT/SAT.
- At the June state board meeting, CDE received approval to study the results and determine if the data was appropriate to use for growth calculations and whether to adjust accountability cut scores.
- Takeaways from the comparability study:
 - It was appropriate to calculate cohort-referenced growth and use in the 2024 performance frameworks with adjusted accountability cut scores.
 - It was not appropriate to calculate baseline-referenced growth, so we cannot make pre-pandemic comparisons for this presentation.



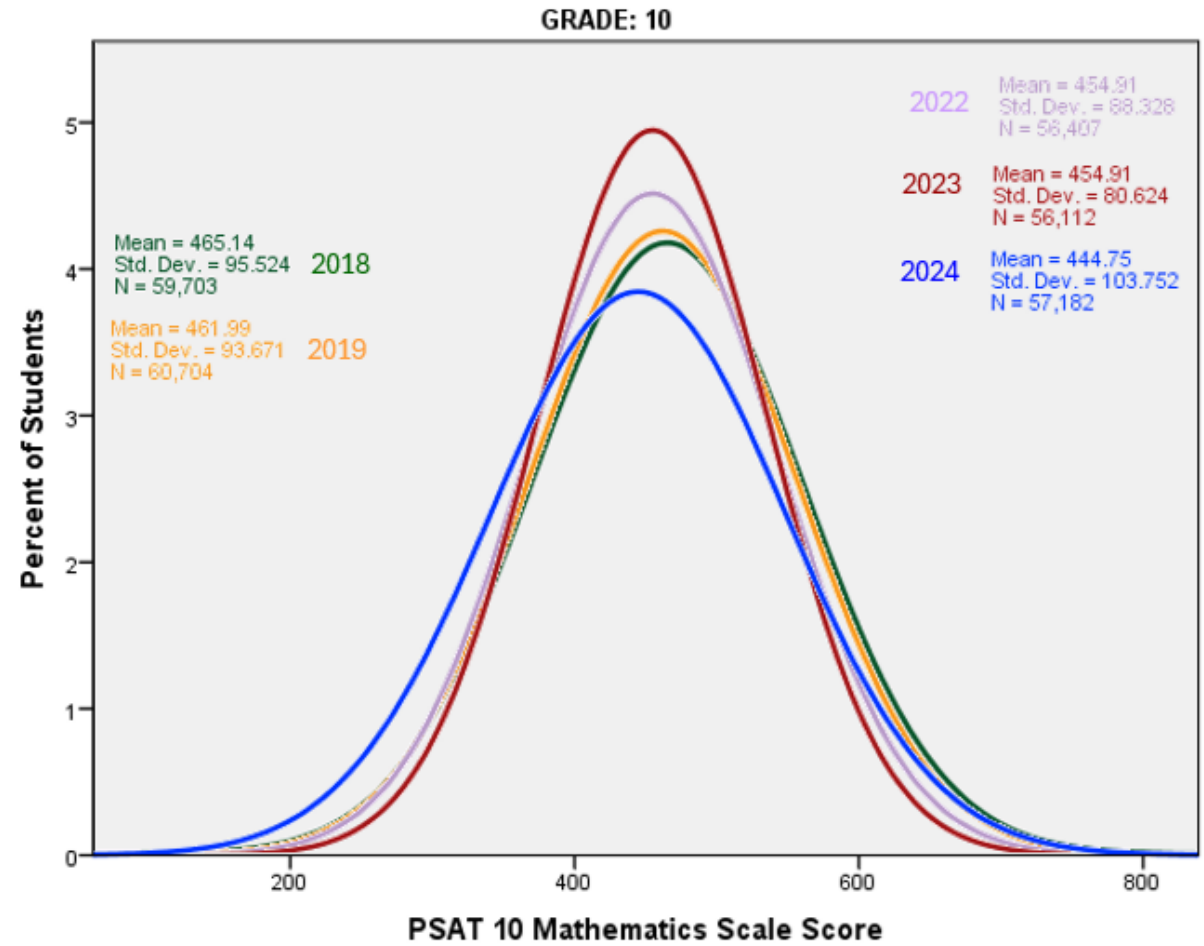
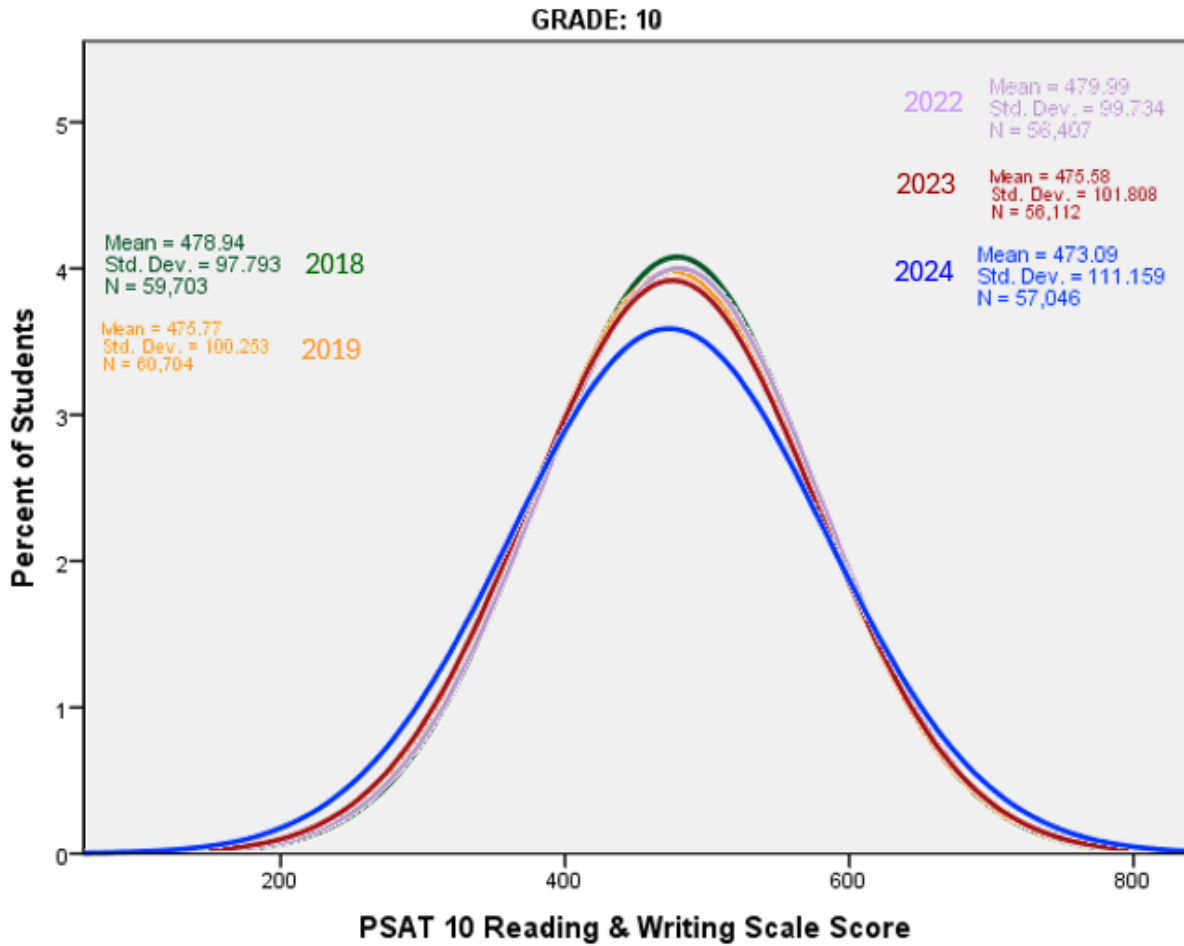
Student Scale Score Distributions- PSAT 9

2024 g9 RW student distribution has widened slightly at both the lower and upper tails, while Math has shifted down about 10 points from 2023 across the whole distribution.



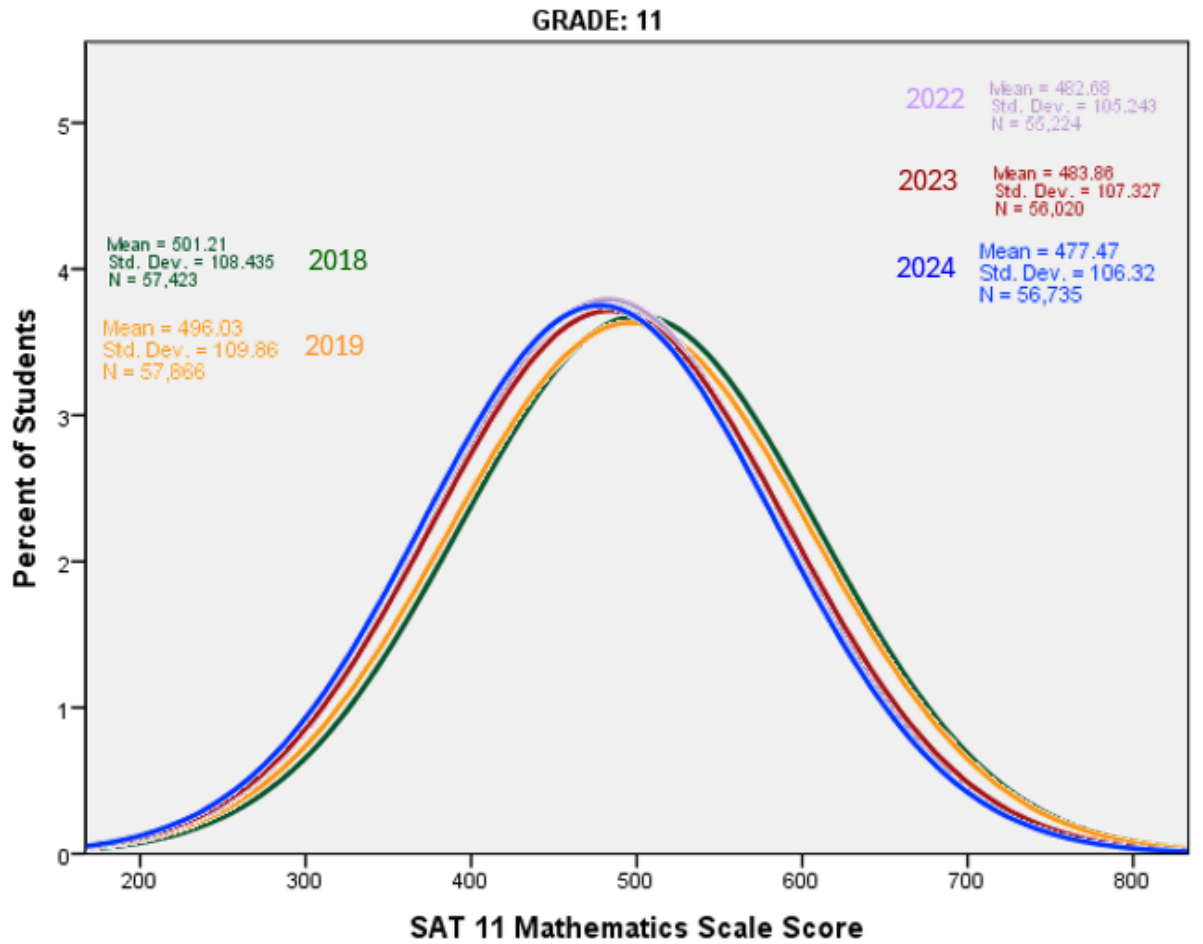
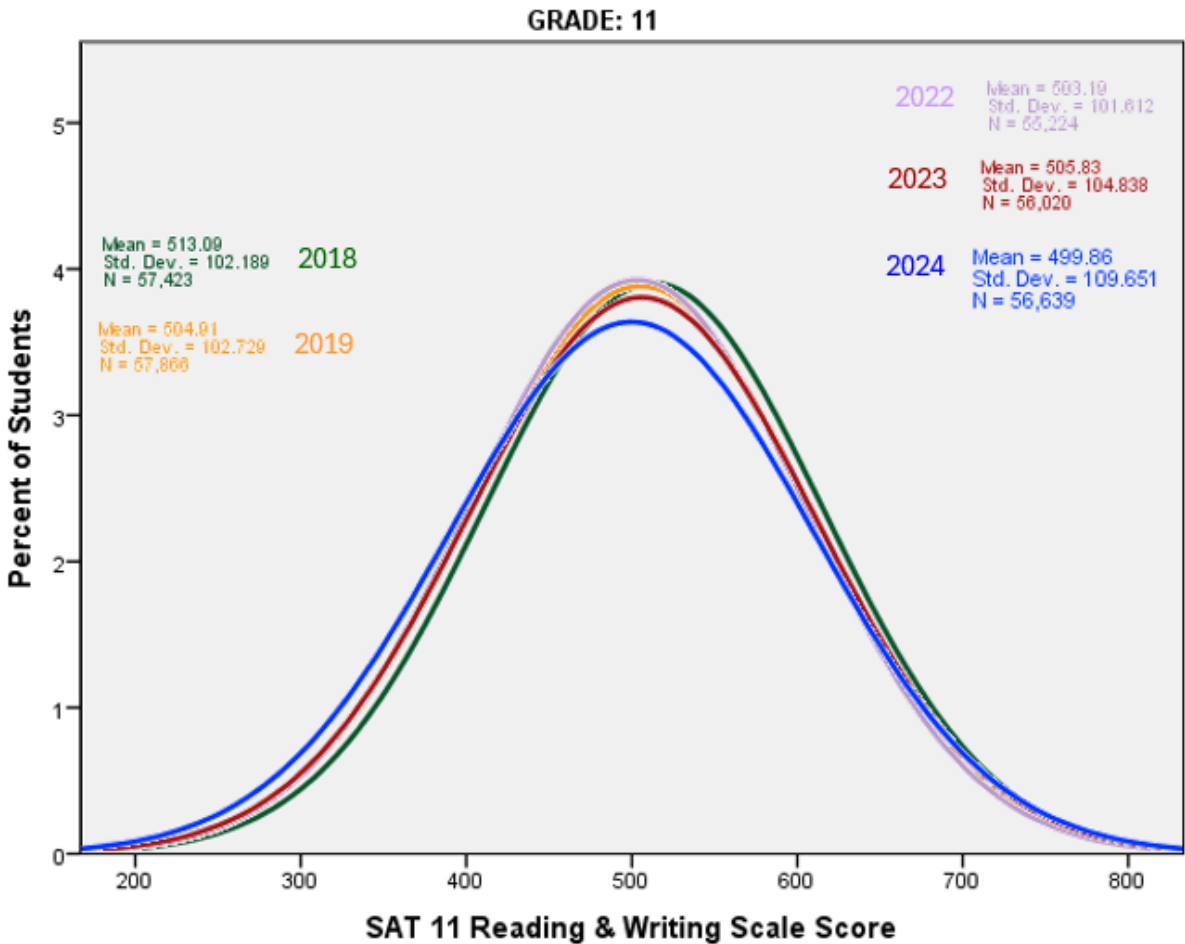
Student Scale Score Distributions- PSAT 10

2024 Grade 10 RW student distribution has a noticeably expanded lower tail and a slightly expanded upper tail. Math distributions have fluctuated a lot over the years (especially 2023) and 2024 shows a 10 point decline driven by a substantial expansion of the lower tail.



Student Scale Score Distributions- SAT 11

2024 grade 11 RW student-level distribution has a slightly expanded lower tail with no change to the upper tail. Grade 11 math scores have slowly declined over time and for 2024 show a 6 point decline driven by declines at both tails.



Impact of a Guessing Parameter

- One change in the new digital PSAT/SAT's psychometric approach was the addition of a guessing parameter as part of the new 3-PL Item Response Theory (IRT) model.
- This means students in 2024 were no longer receiving credit for randomly guessing correct answers to individual test items.
- This is the most likely explanation for the increased numbers of students scoring at the lowest end of the scale score distributions, as shown in the preceding slides.

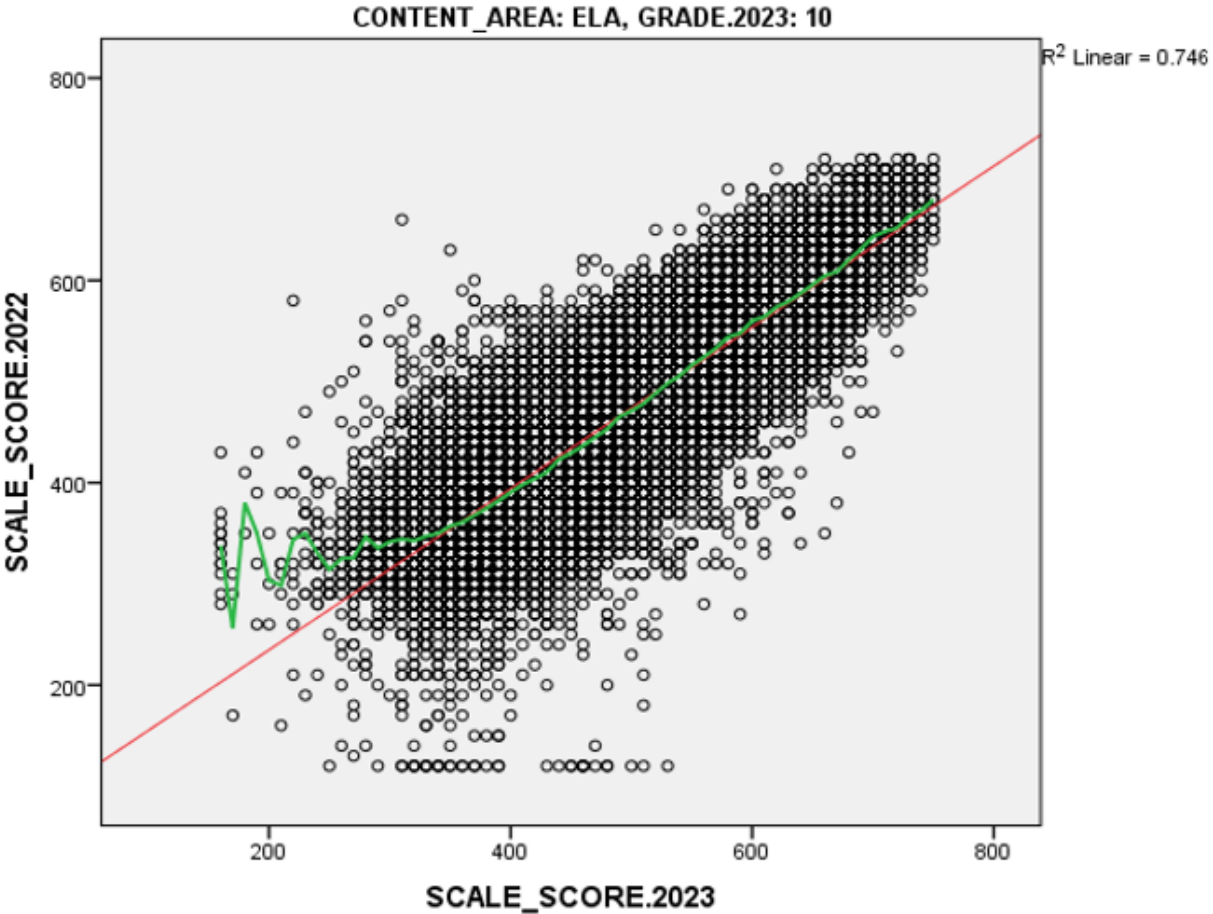
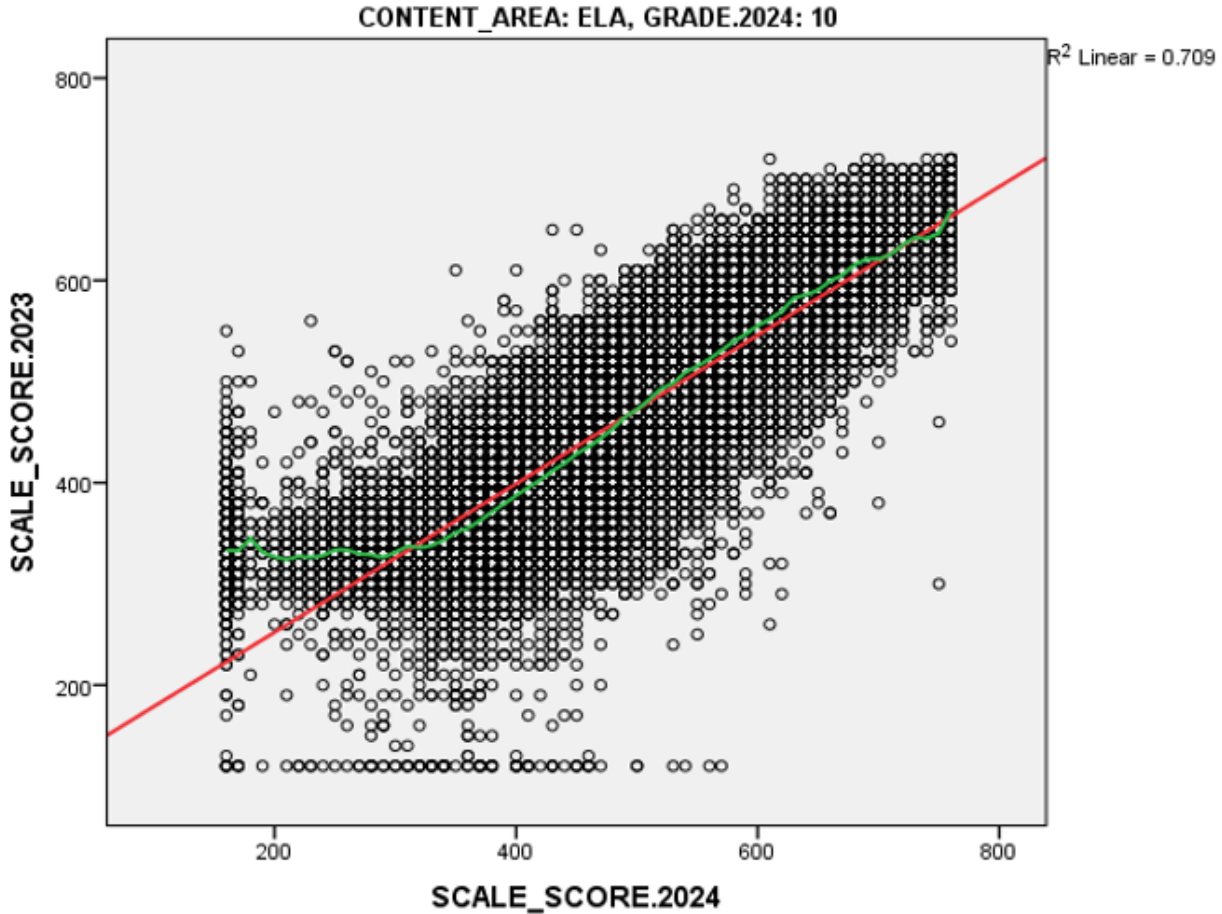
State Level Mean Scale Scores by Demographic Group

SUBJECT	CATEGORY_SIMPLE	GRADE	N_VALID	MEAN_SS
READING & WRITING	All Students	9	57,266	431.0
READING & WRITING	All Students	10	56,869	445.3
READING & WRITING	All Students	11	56,550	477.9
READING & WRITING	English Learners	9	7,265	360.5
READING & WRITING	English Learners	10	5,855	364.2
READING & WRITING	English Learners	11	5,372	381.3
READING & WRITING	FRL Eligible	9	24,037	408.1
READING & WRITING	FRL Eligible	10	22,647	426.9
READING & WRITING	FRL Eligible	11	21,590	450.7
READING & WRITING	Female	9	27,341	458.5
READING & WRITING	Female	10	27,274	482.5
READING & WRITING	Female	11	27,607	503.1
READING & WRITING	Male	9	29,310	446.9
READING & WRITING	Male	10	28,897	468.5
READING & WRITING	Male	11	28,397	499.9
READING & WRITING	Students on IEPs	9	5,391	356.1
READING & WRITING	Students on IEPs	10	4,930	375.9
READING & WRITING	Students on IEPs	11	4,298	396.9
READING & WRITING	Minority Students	9	27,767	418.9
READING & WRITING	Minority Students	10	27,187	438.6
READING & WRITING	Minority Students	11	26,928	462.9

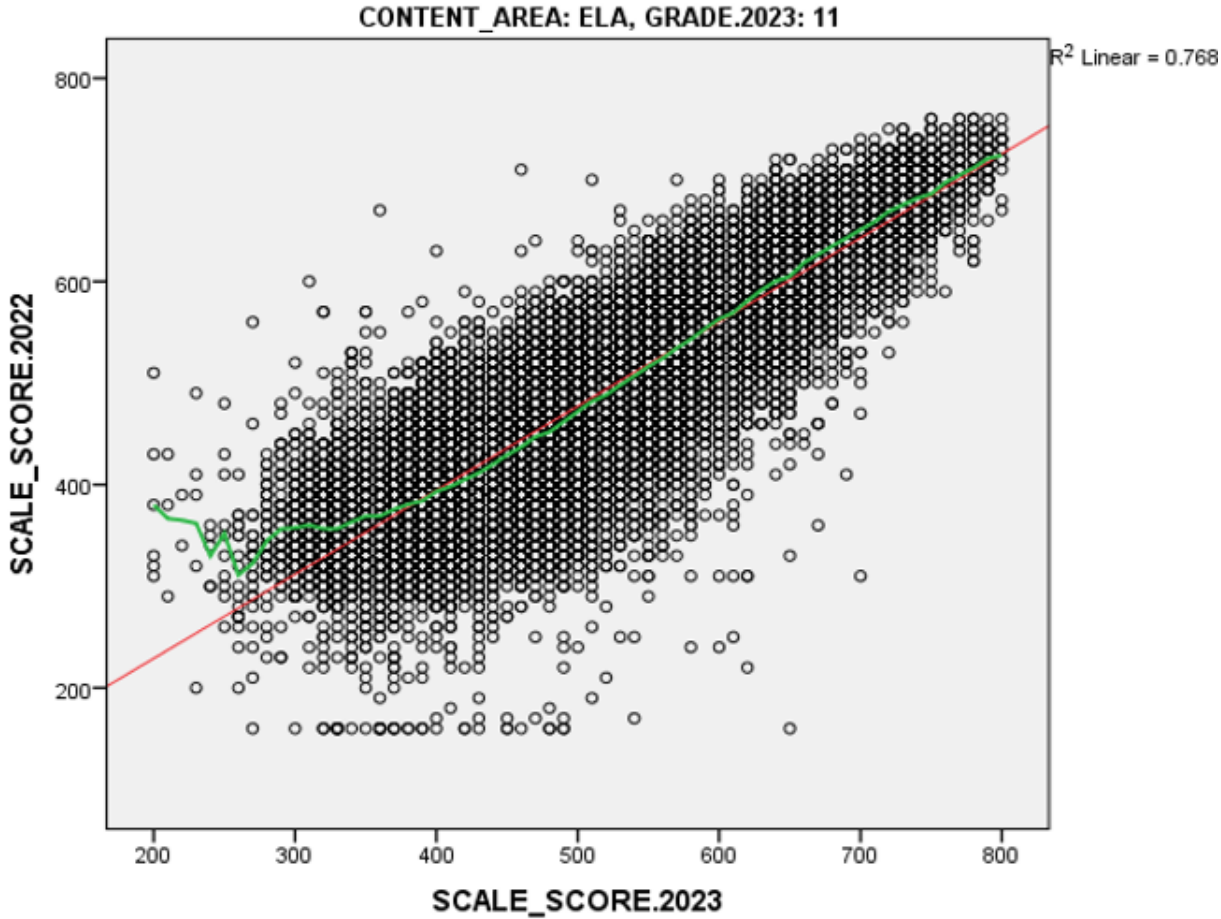
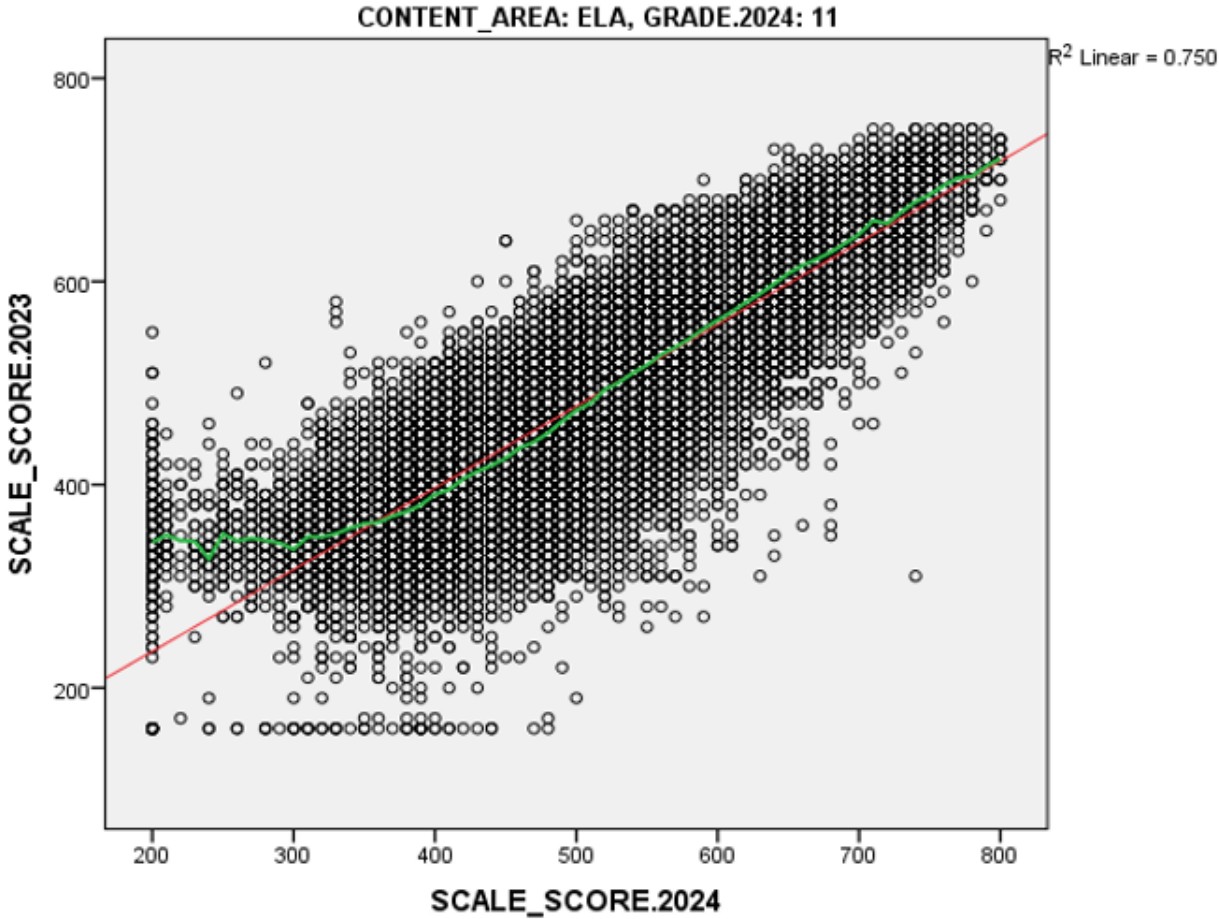
SUBJECT	CATEGORY_SIMPLE	GRADE	N_VALID	MEAN_SS
MATH	All Students	9	56,696	452.6
MATH	All Students	10	56,231	475.3
MATH	All Students	11	56,074	501.6
MATH	English Learners	9	7,831	357.0
MATH	English Learners	10	6,489	358.7
MATH	English Learners	11	5,845	382.6
MATH	FRL Eligible	9	24,357	390.5
MATH	FRL Eligible	10	23,022	400.6
MATH	FRL Eligible	11	21,890	428.7
MATH	Female	9	27,579	428.4
MATH	Female	10	27,575	443.1
MATH	Female	11	27,857	472.0
MATH	Male	9	29,642	433.4
MATH	Male	10	29,234	447.3
MATH	Male	11	28,623	483.6
MATH	Students on IEPs	9	5,397	343.9
MATH	Students on IEPs	10	4,936	353.0
MATH	Students on IEPs	11	4,300	379.3
MATH	Minority Students	9	28,295	401.9
MATH	Minority Students	10	27,789	413.3
MATH	Minority Students	11	27,365	443.7

Scale Scores Between Years- PSAT 9 to PSAT 10, Reading & Writing

Relationship between scores from 2023 to 2024 is similar to the relationship from 2022 to 2023, with the exception of the increased number of students scoring at the LOSS in 2024.

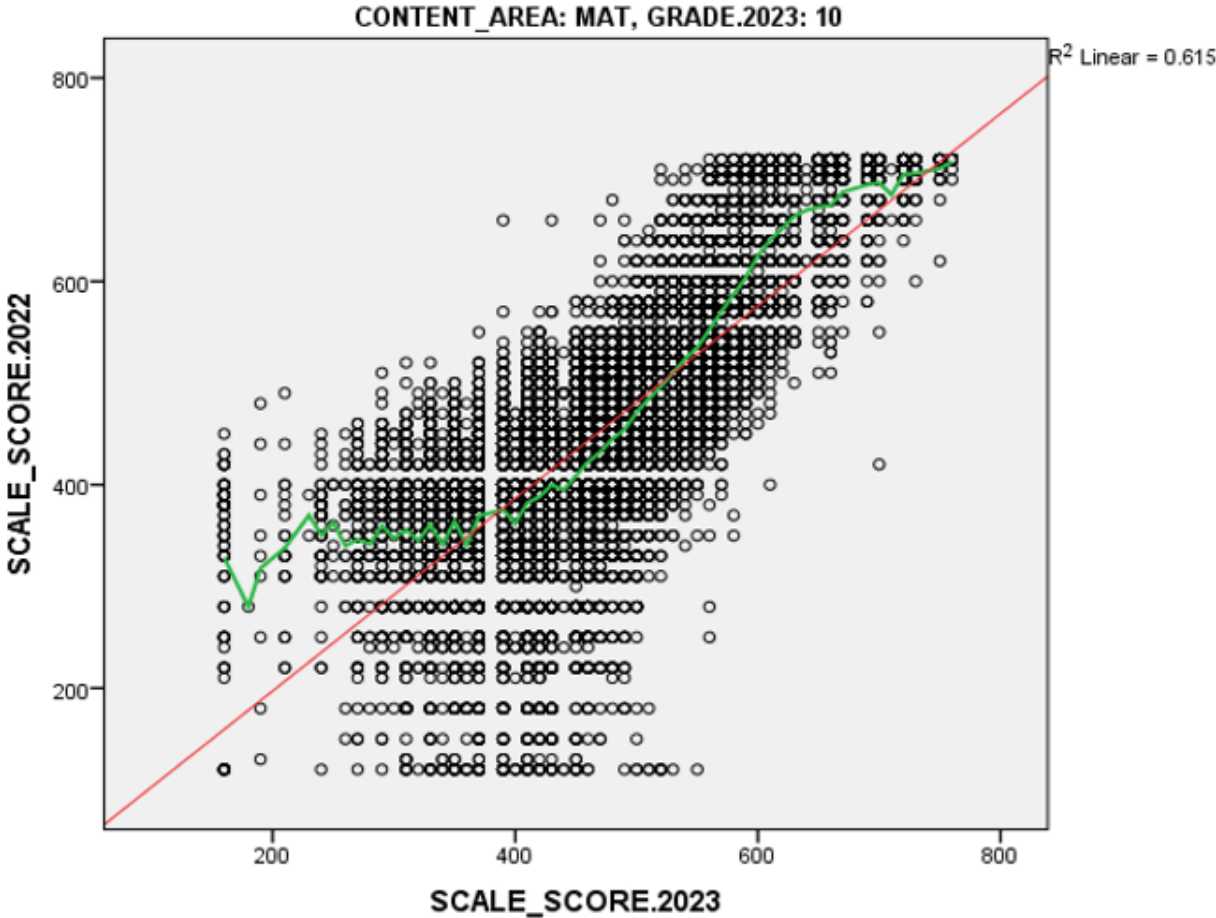
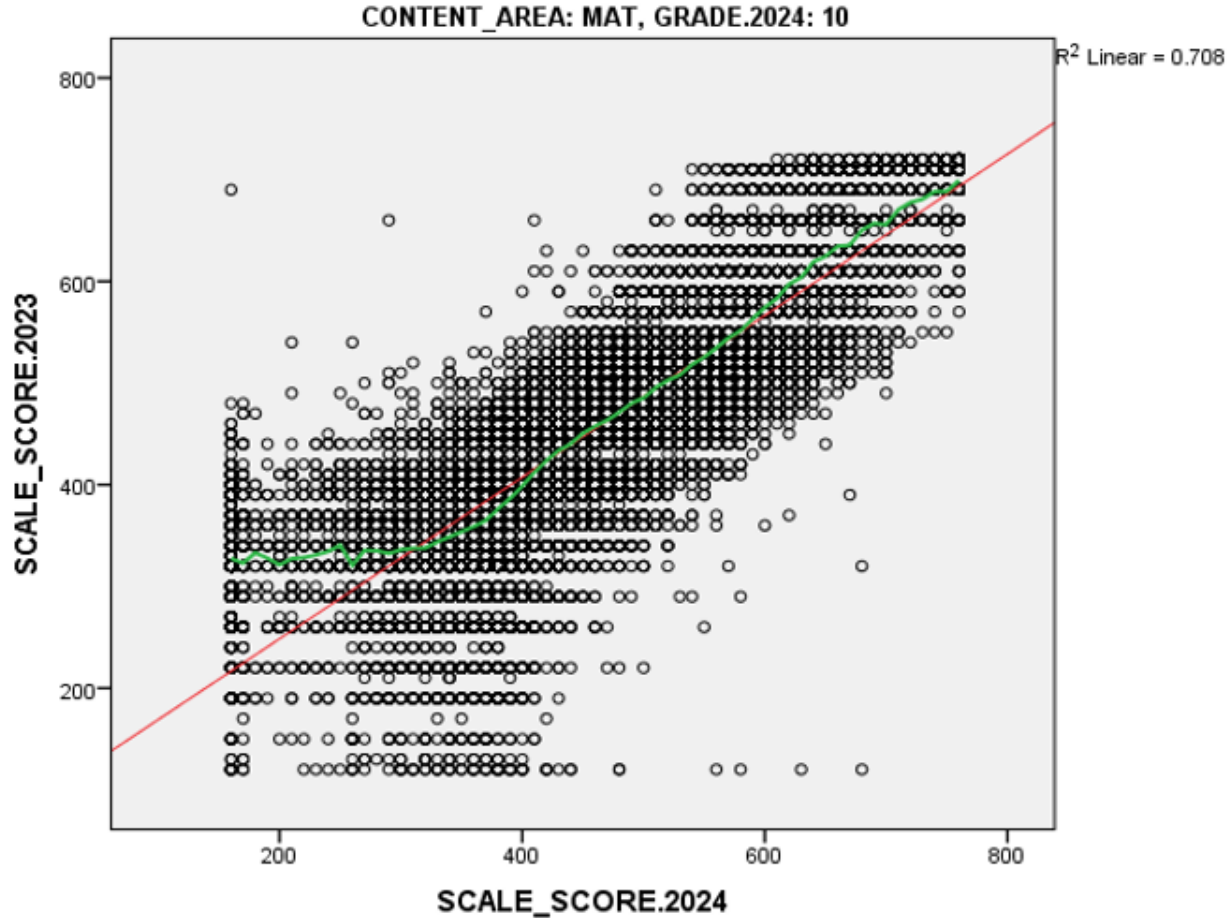


Scale Scores Between Years- PSAT 10 to SAT 11, Reading & Writing

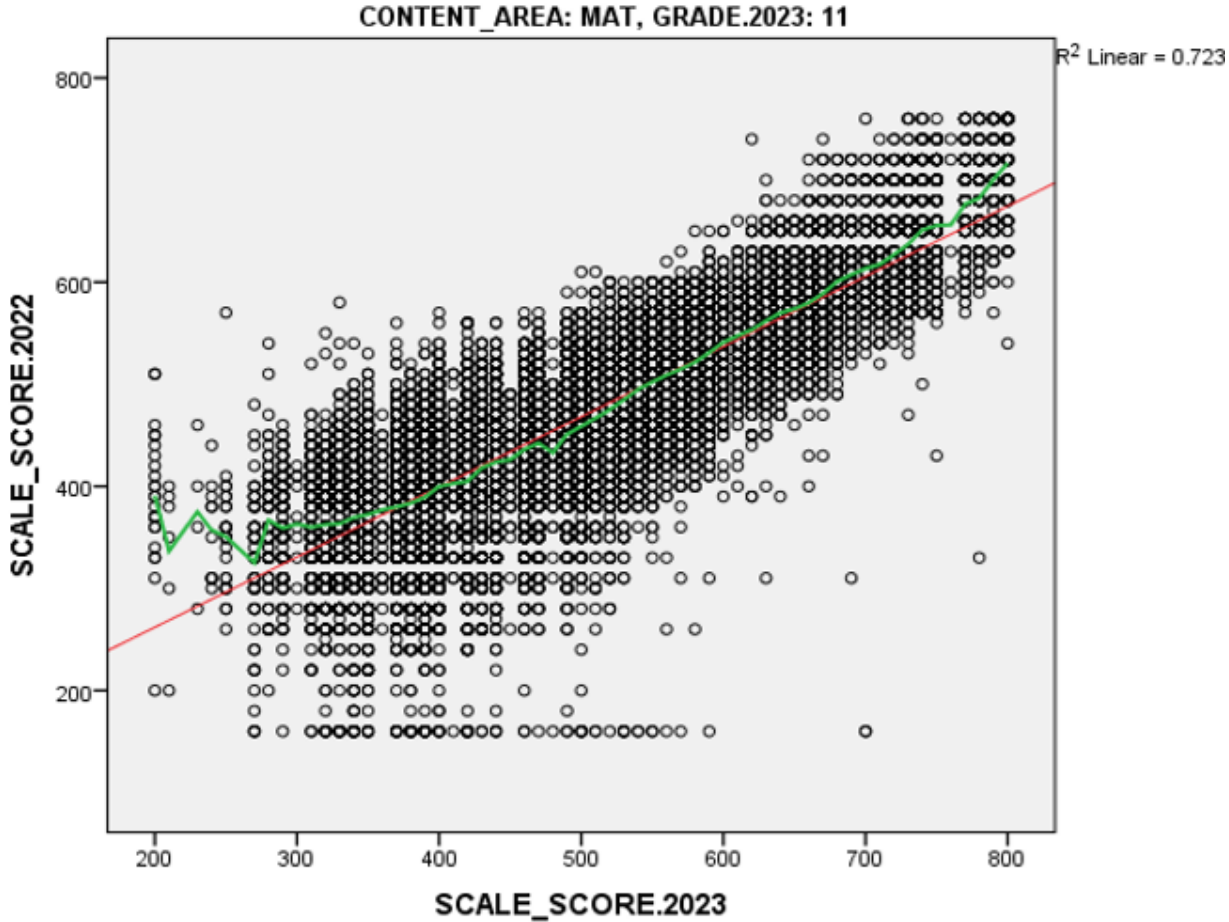
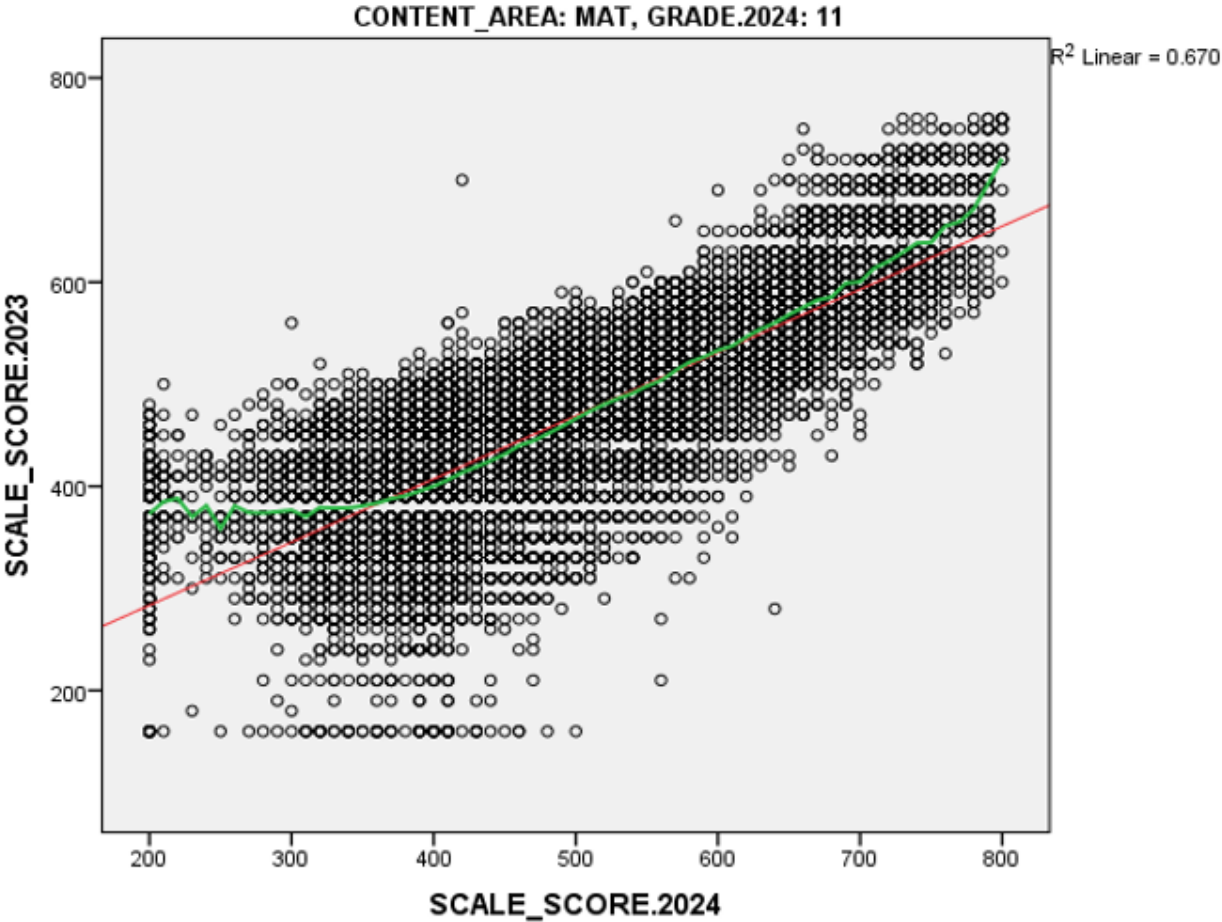


Scale Scores Between Years- PSAT 9 to PSAT 10, Math

Scale score fluctuation in 2023 grade 10 math cause more noticeable differences in the score distributions between years.



Scale Scores Between Years- PSAT 10 to SAT 11, Math



Correlations Between Student Scale Scores from Consecutive Years

Correlations Between Student Scale Scores From Consecutive Years		ELA		Math		
		g9 to g10	g10 to g11	g9 to g10	g10 to g11	
All Students	18 to 19	0.872	0.872	0.843	0.869	
	22 to 23	0.864	0.876	0.784	0.851	
	23 to 24	0.842	0.866	0.841	0.819	
Gender	Female	18 to 19	0.879	0.881	0.839	0.863
		22 to 23	0.871	0.878	0.767	0.837
		23 to 24	0.856	0.874	0.838	0.874
	Male	18 to 19	0.864	0.863	0.845	0.873
		22 to 23	0.857	0.874	0.797	0.86
		23 to 24	0.83	0.86	0.844	0.86
FRLEligible	No	18 to 19	0.866	0.868	0.847	0.871
		22 to 23	0.858	0.874	0.807	0.874
		23 to 24	0.841	0.863	0.853	0.836
	Yes	18 to 19	0.822	0.823	0.762	0.799
		22 to 23	0.807	0.812	0.609	0.812
		23 to 24	0.78	0.814	0.752	0.705
IEP	No	18 to 19	0.865	0.867	0.842	0.865
		22 to 23	0.86	0.872	0.872	0.791
		23 to 24	0.838	0.864	0.844	0.823
	Yes	18 to 19	0.771	0.761	0.624	0.709
		22 to 23	0.734	0.754	0.754	0.445
		23 to 24	0.699	0.733	0.591	0.548

Correlations from 2023 to 2024 are generally similar to or slightly lower than prior year correlations and range from 0.7 to 0.9. This indicates that the relative rankings of students have stayed consistent between years on both the old paper and new digital assessments.

The fairly high correlations for most student demographic groups also indicate that students from historically disadvantaged backgrounds are not being differentially impacted by the transition to the new digital PSAT/SAT.

Note that correlations in math are noticeably lower for some groups from 22 to 23 and 23 to 24, which is likely due to the scale score fluctuation in grade 10 math in 2023.

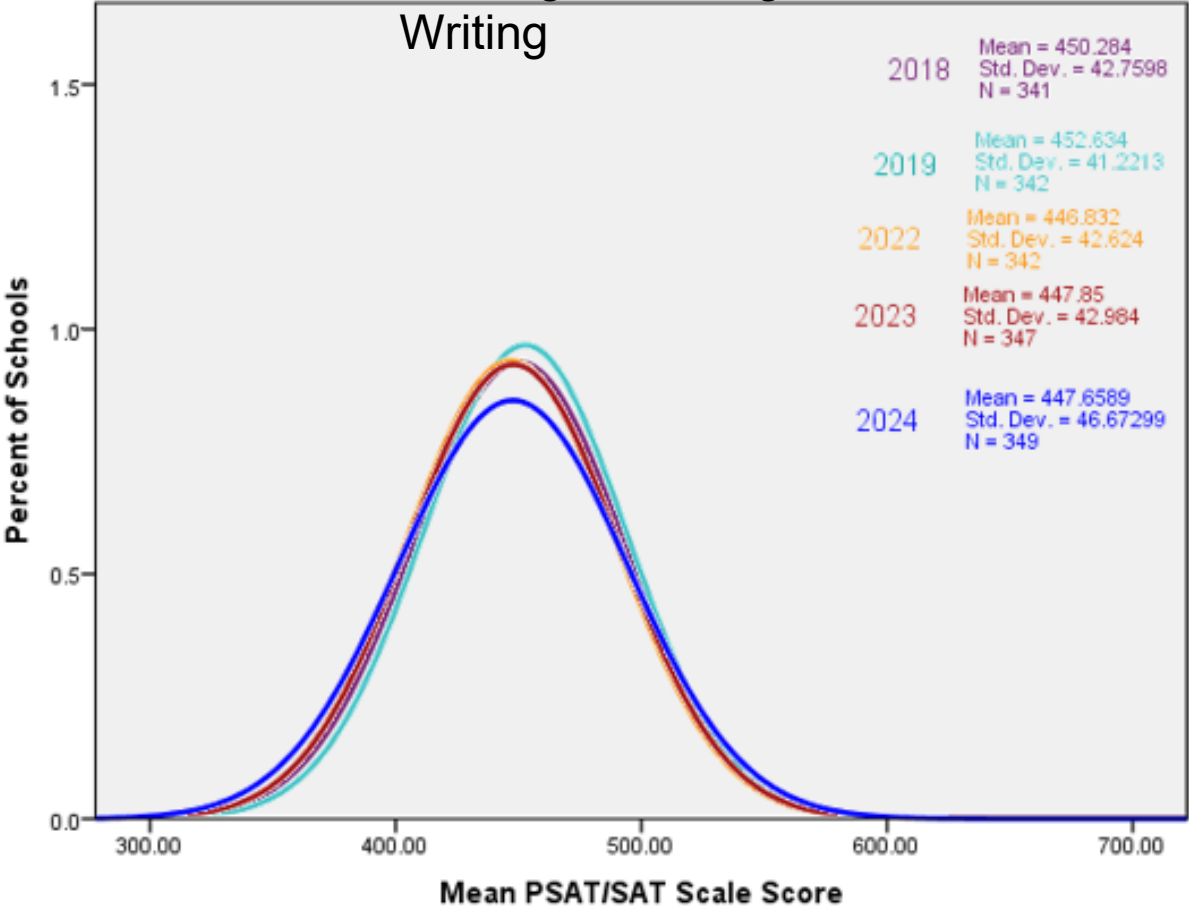
Correlations Between Student Scale Scores from Consecutive Years

Correlations Between Student Scale Scores From Consecutive Years			ELA		Math	
			g9 to g10	g10 to g11	g9 to g10	g10 to g11
Ethnicity	American Indian or Alaska Native	18 to 19	0.848	0.77	0.792	0.765
		22 to 23	0.824	0.836	0.671	0.81
		23 to 24	0.806	0.831	0.803	0.766
	Asian	18 to 19	0.896	0.896	0.881	0.899
		22 to 23	0.89	0.895	0.865	0.9
		23 to 24	0.864	0.878	0.884	0.87
	Black or African American	18 to 19	0.824	0.815	0.761	0.807
		22 to 23	0.817	0.826	0.662	0.772
		23 to 24	0.793	0.815	0.764	0.717
	Hispanic or Latino	18 to 19	0.83	0.826	0.776	0.804
		22 to 23	0.816	0.82	0.639	0.766
		23 to 24	0.78	0.811	0.743	0.703
	Native Hawaiian or Pacific Islander	18 to 19	0.845	0.866	0.868	0.848
		22 to 23	0.883	0.893	0.69	0.82
		23 to 24	0.934	0.847	0.827	0.803
	White	18 to 19	0.861	0.865	0.839	0.868
		22 to 23	0.853	0.868	0.799	0.847
		23 to 24	0.835	0.859	0.85	0.83

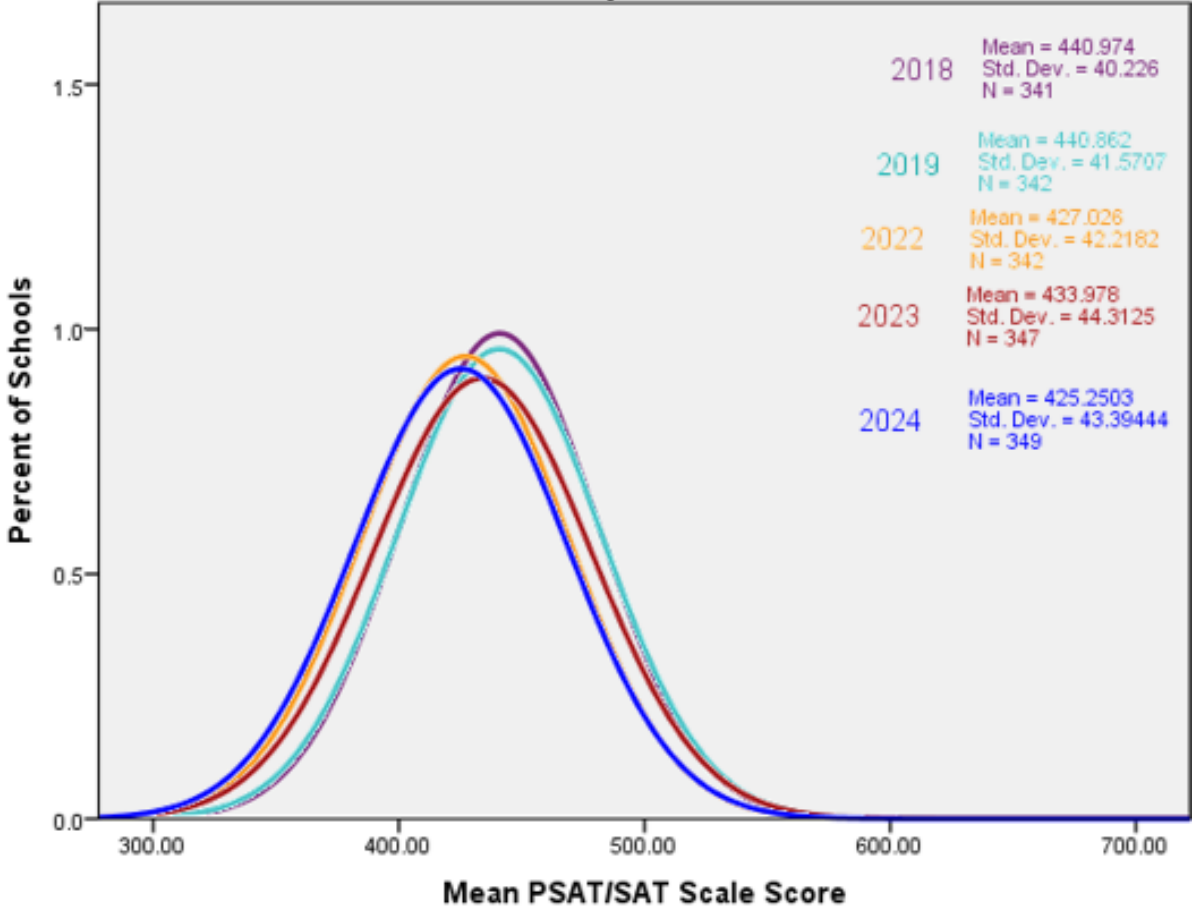
School-level Mean Scale Score Distributions by Year- Grade 9

School level distributions are similar to student-level, but more concentrated towards the mean. Generally, mean scale scores have declined slightly for RW (0-6 points) and more significantly for math (5-12 points)

PSAT g9 Reading & Writing



PSAT g9 Math

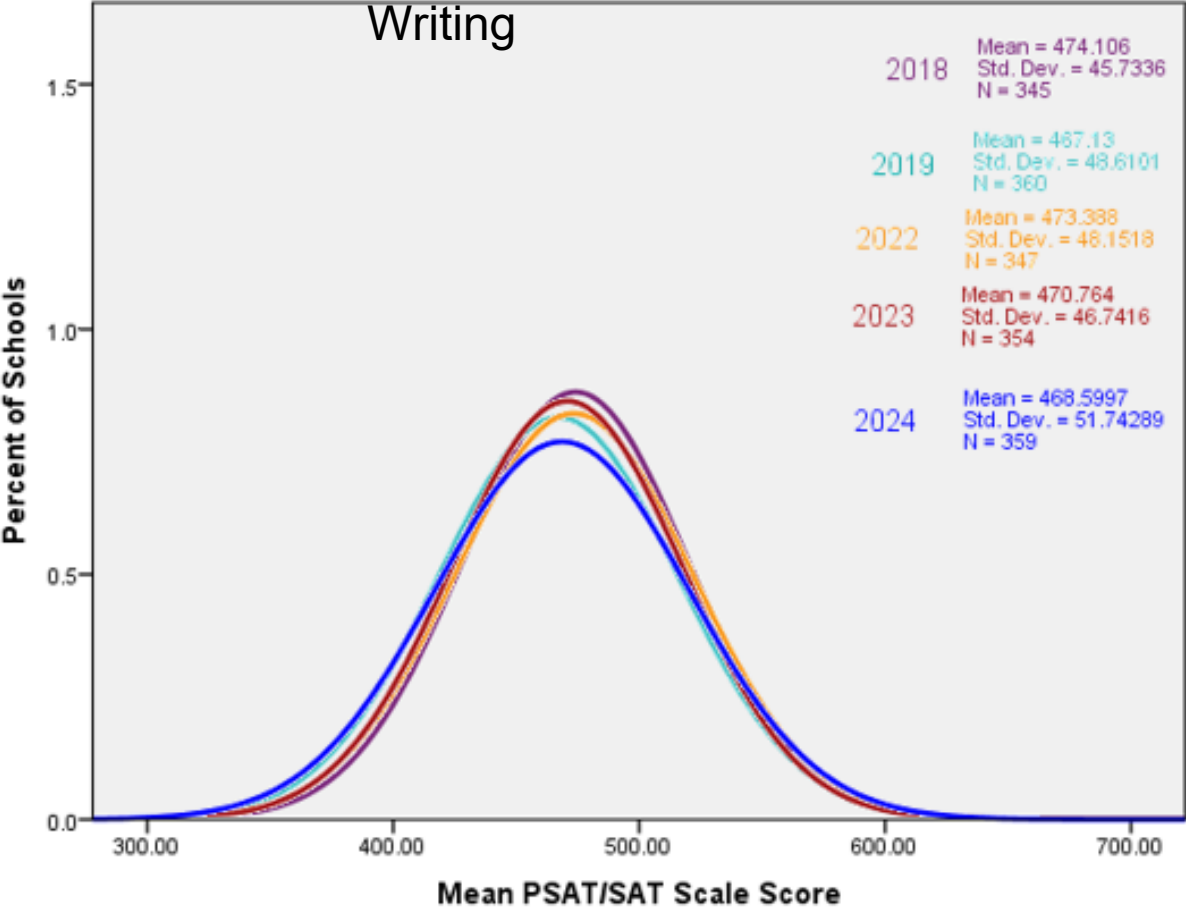


Note: These distributions include AEC's so may not align with the re-normed cut-scores

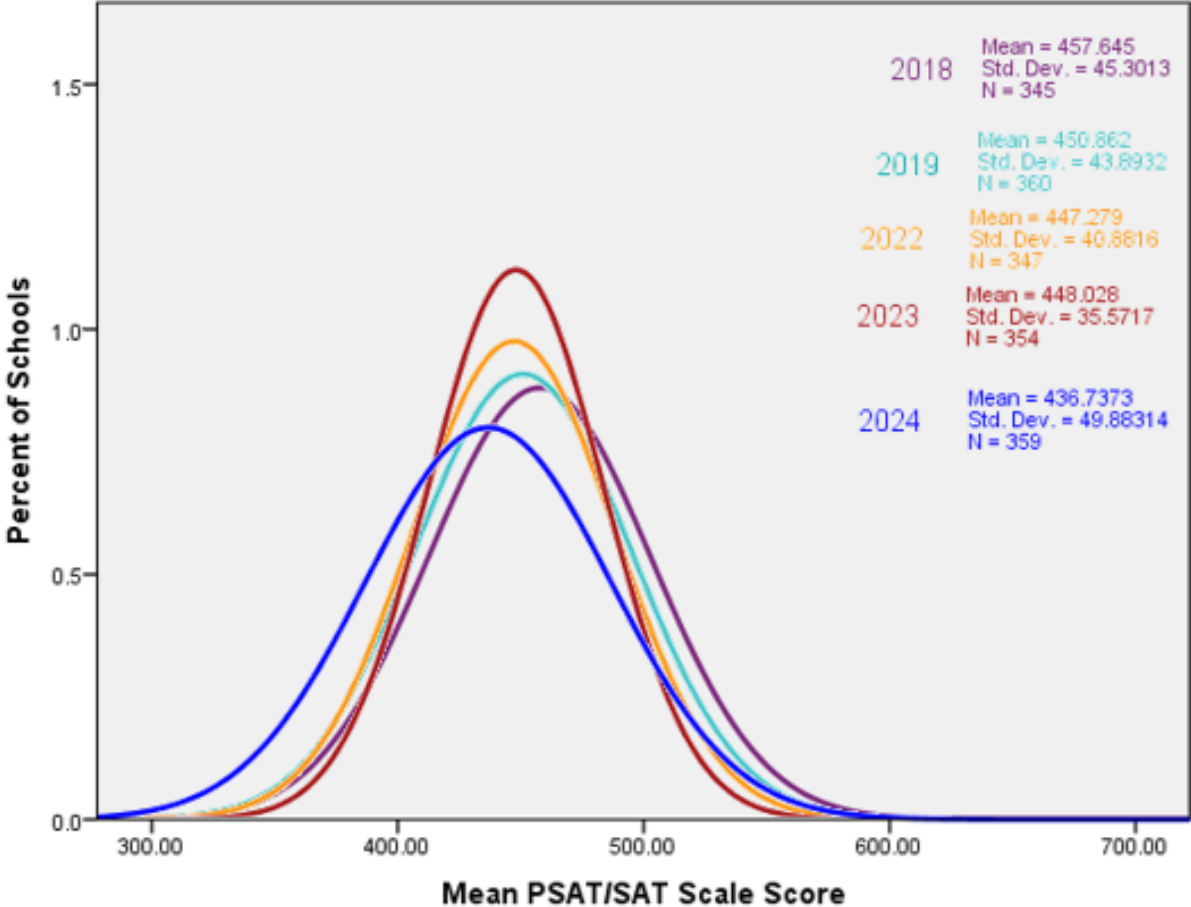


School-level Mean Scale Score Distributions by Year- Grade 10

PSAT g10 Reading & Writing



PSAT g10 Math

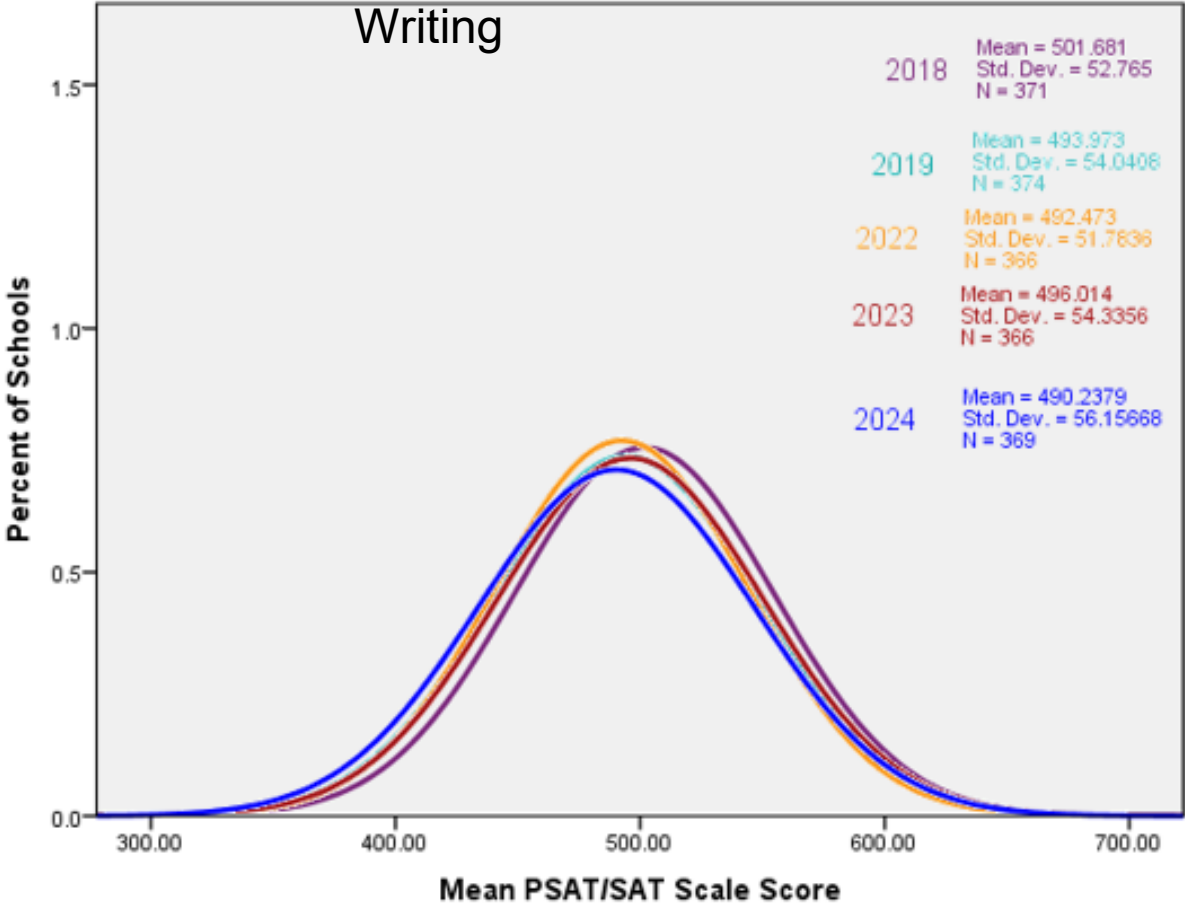


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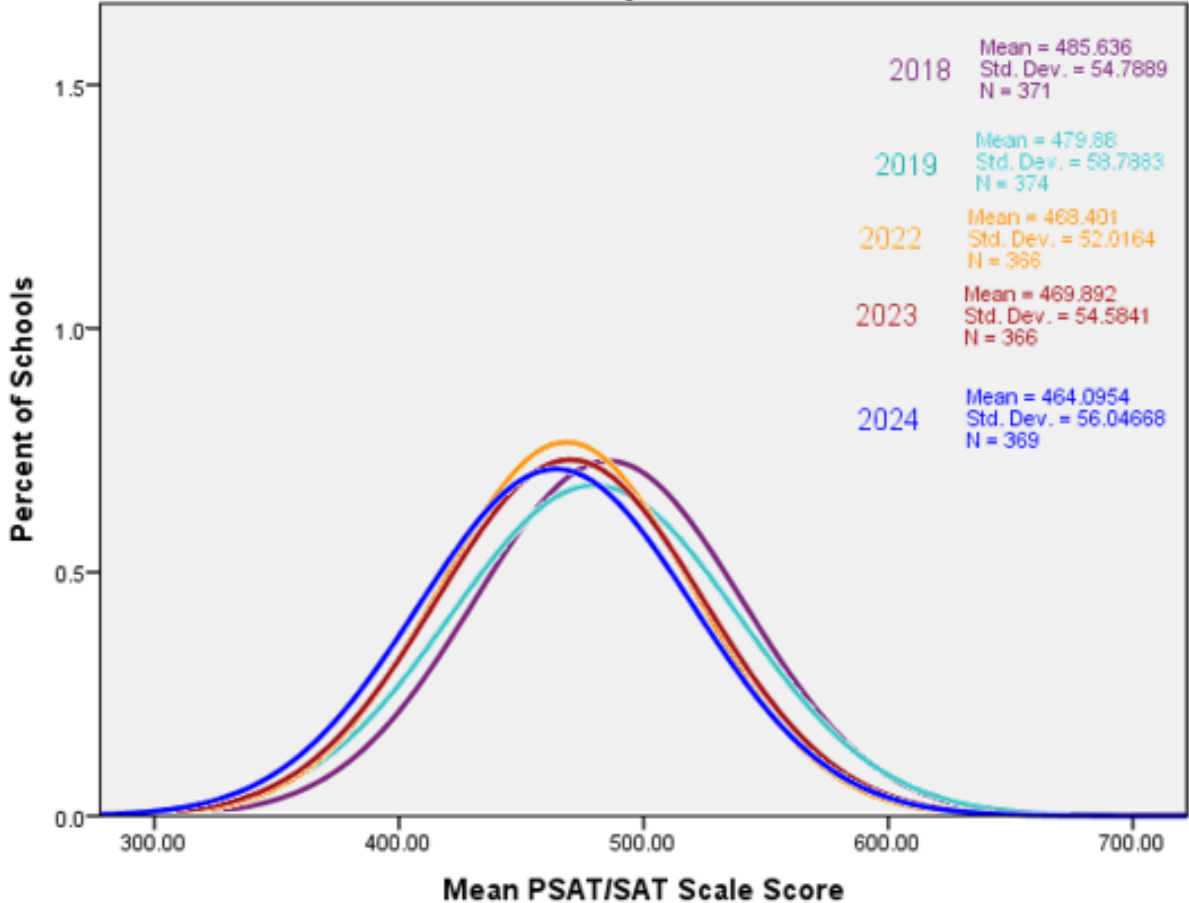


School-level Mean Scale Score Distributions by Year- Grade 11

SAT g11 Reading & Writing



SAT g11 Math

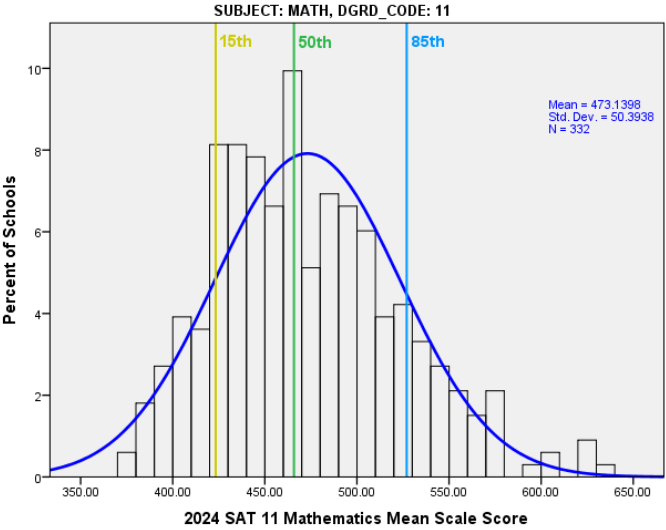
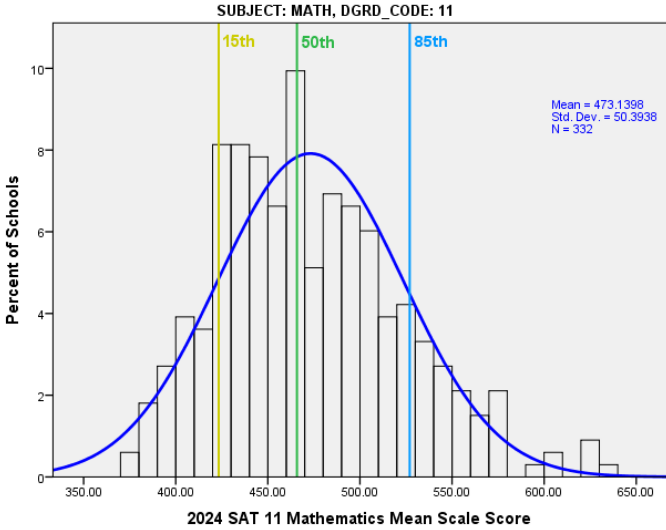
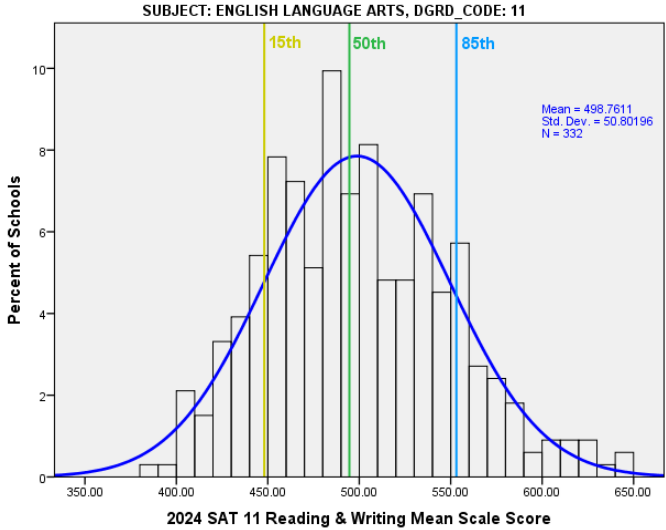
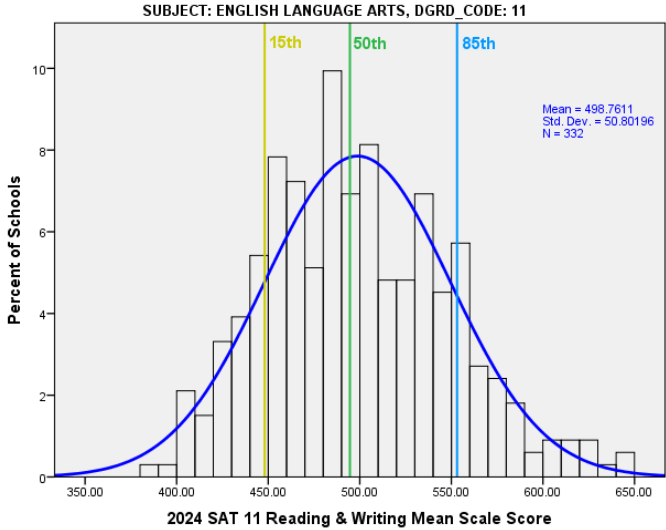


Note: These distributions include AEC's so may not align with the re-normed cut-scores

Calculating Accountability Sub-indicator Cut Scores

- Cut points for the achievement sub-indicators are determined using the school distributions of a given sub-indicator by EMH level and content area.
- In all cases, the distribution of mean scale scores for a given EMH level for a given content area (ex: CMAS English Language Arts for Middle school) is taken across all eligible schools in the state of Colorado, where eligible schools are those which are not designated as Alternative Education Campuses and which have at least 16 valid scores on the assessment in question for accountability use.
- The mean scale scores for all eligible schools in the distribution are then rank-ordered (ties going to the higher rank) to determine percentile ranks for each distribution. The percentile rank for each eligible school is calculated as follows:
$$\text{Percentile rank} = \text{truncate}((\text{school rank} - 1) / \text{total number of eligible schools})$$
- The percentile ranks determined based on the distributions of school outcomes are then used to establish cut points for both the School Performance Framework and for the District Performance Framework.
- Cut points for each rating band (Exceeds, Meets, Approaching, and Does Not Meet) are set based on percentile ranks as follows:
 - Does Not Meet: lowest obtainable scale score to the highest scale score associated with the *14th* percentile rank in the distribution.
 - Approaching: the lowest scale score associated with the *15th* percentile rank to the highest scale score associated with the *49th* percentile rank in the distribution.
 - Meets: the lowest scale score associated with the *50th* percentile rank to the highest scale score associated with the *84th* percentile rank in the distribution.
 - Exceeds: the lowest scale score associated with the *85th* percentile rank in the distribution to the highest obtainable scale score.

Re-norming 2024 Achievement Cut Scores



Note: Re-norming distributions exclude AEC's, schools with less than 16 valid scores, and students who were not continuous from October 1 through testing.

Re-norming 2024 Achievement Cut Scores

- In comparison to the 2019 Baseline cut-scores from the paper PSAT/SAT, 2024 results are lower for all but one content area and rating category. The greatest decreases are in math and for students at the Approaching cut-point.
- There was a slight increase for grade 9/10 Reading & Writing for the highest performing students, but the 2024 Exceeds target was kept the same to avoid a last-minute change that would negatively impact schools/districts.

1-Year SPF/DPF Cut-Points			Calculated Scale Score Cut-Points		Difference 2019 to 2024	Final 2024 1yr
			2019 Baseline	2024 1yr		
Achievement: PSAT & CoAlt DLM Grades 9 & 10	Reading & Writing	15th	423.5	415.1	-8.4	415.1
		50th	461.1	458.9	-2.2	458.9
		85th	505.0	510.1	5.1	505.0
	Math	15th	413.0	387.4	-25.6	387.4
		50th	448.4	430.2	-18.2	430.2
		85th	491.0	480.4	-10.6	480.4
PWR: SAT & Co Alt DLM Grade 11	Reading & Writing	15th	458.0	448.1	-9.9	448.1
		50th	501.3	494.6	-6.7	494.6
		85th	554.7	553.1	-1.6	553.1
	Math	15th	439.9	423.3	-16.6	423.3
		50th	488.0	465.8	-22.2	465.8
		85th	544.6	527.0	-17.6	527.0

Note: Re-norming distributions exclude AEC's, schools with less than 16 valid scores, and students who were not continuous from October 1 through testing.

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- Summary of 2024 Growth & Prelim Framework Results
- Update on 1241 Stakeholder Taskforce
- Update on digital PSAT/SAT Implications for Accountability
- Changes for 2025 frameworks & Prep for 2025 Target Setting
- Public Comment



Potential Cut Score Revisions for 2025

1-Year SPF/DPF Cut-Points			Calculated Scale Score Cut-Points		Difference 2019 to 2024	Final 2024 1yr
			2019 Baseline	2024 1yr		
Achievement: PSAT & CoAlt DLM Grades 9 & 10	Reading & Writing	15th	423.5	415.1	-8.4	415.1
		50th	461.1	458.9	-2.2	458.9
		85th	505.0	510.1	5.1	505.0
	Math	15th	413.0	387.4	-25.6	387.4
		50th	448.4	430.2	-18.2	430.2
		85th	491.0	480.4	-10.6	480.4
PWR: SAT & CoAlt DLM Grade 11	Reading & Writing	15th	458.0	448.1	-9.9	448.1
		50th	501.3	494.6	-6.7	494.6
		85th	554.7	553.1	-1.6	553.1
	Math	15th	439.9	423.3	-16.6	423.3
		50th	488.0	465.8	-22.2	465.8
		85th	544.6	527.0	-17.6	527.0

Move forward with increased 2024 Exceeds target for PSAT Reading &

3-Year SPF/DPF Cut-Points			Scale Score Cut-Points		Difference 2019 to 2024	Final 2024 3yr
			2019 Baseline	2024 3yr		
Achievement: PSAT & CoAlt DLM Grades 9 & 10	Reading & Writing	15th	423.5	419.1	-4.4	419.1
		50th	461.1	457.7	-3.4	457.7
		85th	505.0	507.5	2.5	505.0
	Math	15th	413.0	397.6	-15.4	397.6
		50th	448.4	434.3	-14.1	434.3
		85th	491.0	479.4	-11.6	479.4
PWR: SAT & CoAlt DLM Grade 11	Reading & Writing	15th	458.0	452.5	-5.5	452.5
		50th	501.3	495.1	-6.2	495.1
		85th	554.7	552.5	-2.2	552.5
	Math	15th	439.9	424.7	-15.2	424.7
		50th	488.0	466.4	-21.6	466.4
		85th	544.6	522.5	-22.1	522.5

Re-norm all 3-year targets based on combined 2025, 2024 digital and 2023 paper results?

CoAlt DLM = Alternate Assessment program designed for students with significant cognitive disabilities
 PWR = Postsecondary and Workforce Readiness

TAP Recommendations

For 2025 Target Setting with SBE

- Does the TAP recommend reviewing the 2025 results and (if appropriate) increasing the Exceeds cut-score target for PSAT 9/10 for Reading & Writing to align with 2024 results? **Yes**
- Does the TAP recommend updating the 3-year cut-score targets based on 2025, 2024 digital results and 2023 paper results? With the intention of re-norming again in 2026 with the three most recent years of digital results? **Yes**