IMPACT OF SCORE SETTING OPTIONS ON STATE ASSESSMENTS REQUIRED FOR GRADUATION

Executive Summary

Dr. Andrew Parr has prepared an in-depth technical memorandum that addresses member questions and provides detailed information about projected outcomes based on the various graduation score-setting options discussed by the Board. Atypical patterns are noted in the results of the 10th and 11th grade cohorts taking the SBAC, and various hypotheses are discussed, including the potential influence of different motivation levels, and the impact of parent refusals on the assessed population. While it cannot be determined what specifically caused the inconsistencies in the data, Dr. Parr expresses reservations about using the aggregate data from the 11th grade cohort to calculate an equi-percentile score, and favors the use of the 10th grade cohort data for reasons discussed. Data tables show the number of students passing based on the various options, including subgroup performance data.

Summary Table of Cut Score Options for ELA for Graduation Requirement

Threshold Option	Scaled Score	Percent Meeting Graduation Requirement if Adopted
Matched Cohort	2487 This score is believed to be impacted by motivation factors.	11th Grade = 79.3 percent 10th Grade = 90.1 percent The 10th graders outperformed the 11th graders suggesting that the performance of some 11th grade students is not accurately reflected in the assessment data.
Level 2	2493	11th Grade = 78.0 percent 10th Grade = 90.9 Very close to the Matched Cohort derived threshold. Would have the appearance of lowering standards for students.
Level 2.6	2548 This threshold is derived from the 10th Grade SBAC ELA	11th Grade = 63.3 percent 10th Grade = 81.0 percent The score is derived from the three-year average success rate for the 10th Grade HSPE in Reading and Writing.
Level 3	2583	11th Grade = 52.6 percent 10th Grade = 72.0 percent The lower percentage of students meeting the test score means that more students would retake the assessment or attempt to meet the graduation requirement through an approved alternative

Summary Table of Cut Score Options for Math Graduation Requirement

Threshold Option	Scaled Score	Percent Meeting Graduation Requirement if Adopted
Matched Cohort	2469 This score is believed to be impacted by motivation factors.	11th Grade = 75.6 percent 10th Grade = no data Threshold score is in SBAC Level 1 and would be viewed as lowering standards. This design produced the lowest of the threshold score options.
Level 2	2543	11th Grade = 55.4 percent 10th Grade -= no data The lower percentage of students meeting the threshold means that far more students would retake the assessment meet graduation requirements through an approved alternative.
Level 2.6	2595 This threshold is proportional to the threshold derived from the 10th Grade SBAC ELA	11th Grade = 39.4 percent 10th Grade = no data This approach does not consider the fact that math success rates are often differ from the reading or ELA success rates and does not reflect actual math assessment results.
Level 3	2628	11th Grade = 29.9 percent 10th Grade = no data The lower percentage of students meeting the test score means that more students would retake the assessment or attempt to meet the graduation requirement through an approved alternative

Organization of this Memo

The memo describes options for the Board to consider when adopting a scaled score necessary to meet the graduation requirements. The options are described from the lowest scaled score option (easiest to meet) to the highest scale score option (most difficult to meet) for 11th grade math, 11th grade ELA, and lastly 10th grade ELA. Each of the options is supported by a chart that shows the percentage of students (All Students and by race/ethnicity) that would meet the corresponding test score measure – essentially meet that graduation requirement. Each of the charts includes a horizontal red line that marks the success rate for the All Students group and is included as a reference line so that the user can readily compare subgroup performance to the All Students performance.

Approved Graduation Score Setting Methodology

At the November 2014 SBE meeting, the Board approved a methodology to identify the score necessary to earn a Washington Certificate of Academic Achievement (CAA) that would seek to achieve an equal

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impact between the 2013-14 10th grade High School Proficiency Exams (HSPE) and End of Course math assessments (EOCs) and the 2014-15 Smarter Balanced (SBAC) assessments through the use of a matched cohort of test takers in each of the assessment years. By using this matched cohort design, the performance of the students on the HS SBAC could be directly compared to the earlier performance on the HSPEs and EOCs and an equal impact scaled score could be determined.

After the methodology was approved, the news press began to report on a widespread and well organized effort encouraging the parents of students to exercise their option to refuse student testing. Early reports indicated that, at some schools, the entire population to be tested was refusing to test and that as many as one-half of all 11th grade students were refusing to test. In the late spring of 2015, the OSPI reported that the confirmed test refusal rate for the 11th grade population was approximately 25 percent but might reach the 50 percent mark after a more detailed analysis of student results. In light of this extraordinary refusal rate, the OSPI determined that the matched cohort of students who actually assessed would be of sufficient size to conduct the required analyses, so long as the matched cohort was representative (demographically and academically) of the 11th grade population.

The OSPI conducted a series of analyses and verified that the matched cohort was demographically similar to the 11th grade population and thus, the determination of the score needed to earn a CAA was still possible. However, early analyses of the SBAC results showed that the statewide performance of the 11th grade students was lower than anticipated on the SBAC ELA and far lower than expected on the SBAC Math. Analyses of the 10th grade results for the SBAC ELA showed that the 10th graders outperformed the 11th graders by a substantial margin. With this early information, a couple of hypotheses were put forth:

- The 10th graders were informed in advance that the ELA results would be one of several determining factors for high school graduation and, because high stakes were attached, the 10th graders were motivated to do well on the assessment.
- The 11th graders were informed that their HSPE and EOC results could be used to meet graduation requirements and, because the SBAC did not have stakes attached, the 11th graders had little incentive to do their best work on the assessment.

Notwithstanding, the OSPI moved forward with the graduation benchmark setting task based on the assessment results of the 10th and 11th grade data sets, with the knowledge that if large numbers of 11th grade students were not motivated to perform well on this assessment, the statewide 11th grade results may not accurately reflect the measure of the ability of the test takers. The impact data from the 10th grade student results may be more meaningful and more reflective of student performance. Over-reliance on the 11th grade impact data may lead to the adoption of a score required for graduation that is unusually low and is based on results that do not reflect of actual ability of the 11th grade test takers.

Recognizing that the 11th grade matched cohort methodology and design may not be appropriate for the intended purpose in light of the assessment results, the OSPI developed several options for the Board to consider in fulfilling their requirement of adopting the ELA and math scores necessary to earn a CAA to be part of the state's high school graduation requirements.

Options

- Method 1: Using the equal impact threshold scores derived from the matched cohort
- Method 2: Using the SBAC Level 2 threshold scores for ELA and Math as the scores necessary to earn a CAA
- Method 3 Using a modified methodology (Level 2.6) to calculate the ELA and Math scores necessary to earn a CAA based on the performance of the 10th grade test takers.

- Method 4: Using the SBAC Level 3 threshold scores for ELA and Math as the scores required to earn a CAA

The results of the data analyses for the 11th grade students and the 10th grade students are presented on the following pages. The descriptions and discussion of the 11th Grade SBAC results and impact data are consistent with the methodological options requested by the Board. However, be advised that the aggregated 11th grade results show inconsistent patterns. It is difficult to envision a scenario in which a population of 10th grade test takers would outperform the 11th grade population – and by a substantial margin. The SBE staff believes that the statewide aggregated 10th Grade SBAC assessment results and impact data should be the primary data source to consider when adopting the scores that must be earned for high school graduation.

Results of Data Analysis

11th Grade Math

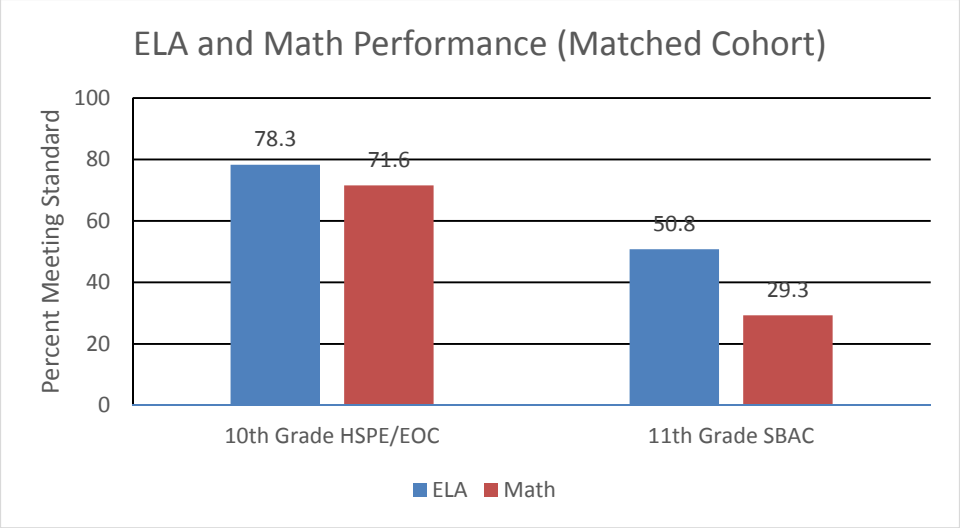
Method 1: Option 1

Matched Cohort Design

Following a few processing steps, the 10th Grade HSPEs (Reading and Writing) and the Math EOCs for the matched cohort showed proficiency rates of approximately 79 percent on ELA and approximately 76 percent on Math (Chart 1). When the matched cohort participated in the 2014-15 SBAC assessments, the cohort achieved a rate of 50.8 percent meeting standard (Levels 3 and 4) on the ELA and a rate of 29.3 percent meeting standard on the Math assessment. Both of the rates were lower than expected and several hypotheses were put forth to account for the lower than anticipated success rates. Some of the ideas included the following:

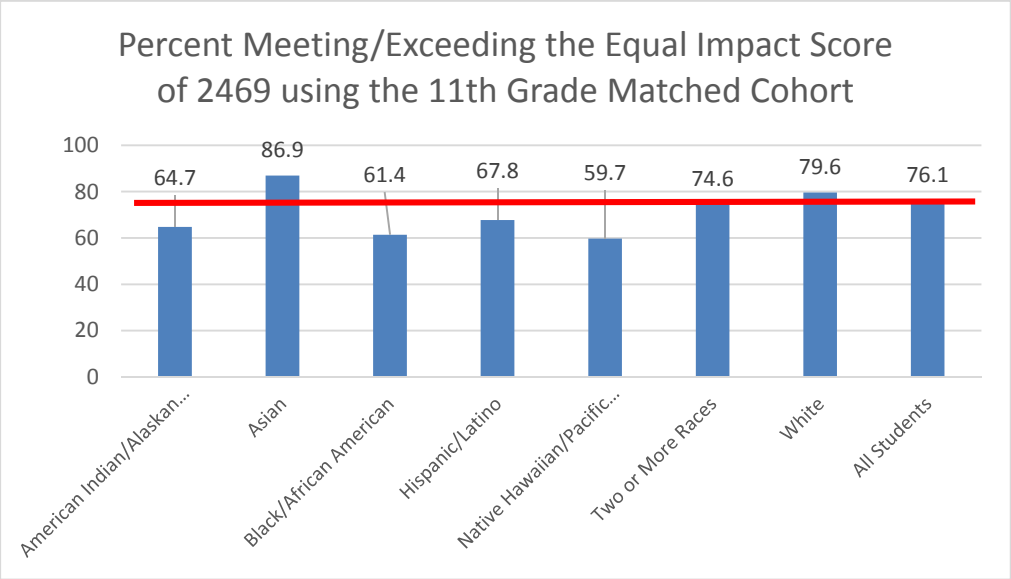
- The population of students who refused to test had a particular set of student demographics that skewed the student results in an unexpected manner.
- The assessments were more difficult than expected for the 11th grade students and, perhaps, the content assessed differed substantially from the content that was taught in the classroom.
- The 11th grade students who participated in the administration were not motivated or incentivized in a manner to bring out their best possible performance.

Chart 1: Percent of the matched cohort meeting standards on the 2013-14 HSPE/EOCs and the 2014-15 SBAC assessments.



Following the methodology approved by the State Board of Education (SBE) at the November 2014 meeting that used an equal impact, matched cohort design, a math scaled score of 2469 was calculated as the scaled score resulting in equal impact. Based on the prior score history of the matched cohort, the methodology targeted a success rate of 75.6 percent. When the scaled score is applied to the 11th grade student results, approximately 76.1 percent meet or exceed the measure and that compares favorably to the OSPI targeted rate. Figure 1 shows that the percent of 11th grade students meeting or exceeding the equal impact scaled score varies considerably by race and ethnicity.

Figure 1: Percentage of 11th grade students meeting or exceeding the equal impact scaled score for math as determined by the equal impact, matched cohort, design.

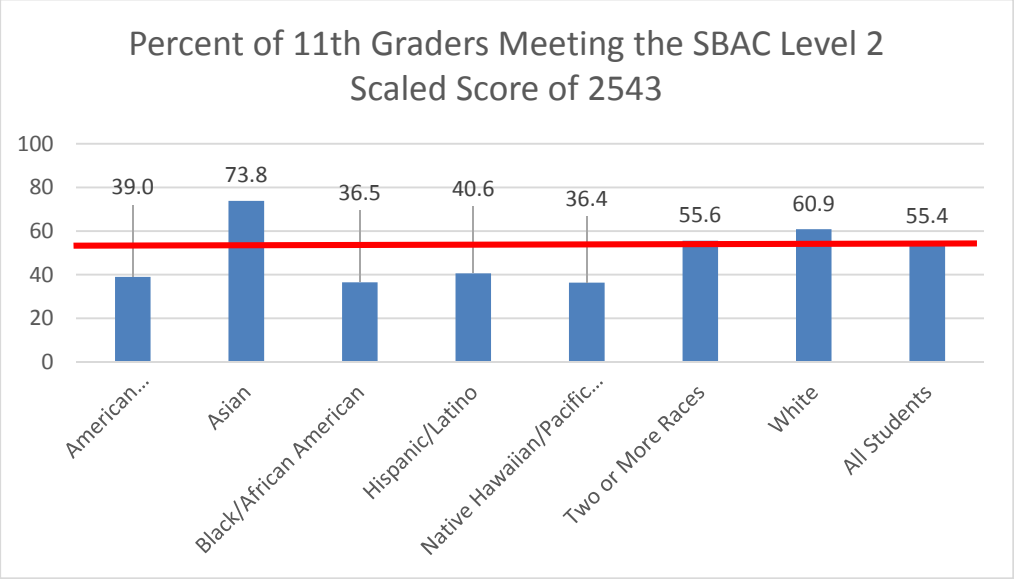


Method 2: Option 2

Level 2 Math Scaled Score Option

The Board may opt to approve the HS SBAC Level 2 threshold score for math of 2543 as the score to be used as one of the graduation requirements. When this score was applied to the student results, 55.4 percent of the matched cohort meet or exceeded this benchmark (Figure 2). This means that if this scaled score was adopted, a little less than one-half of 11th graders would be required to retake the test in their senior year or meet this graduation requirement through one of the current alternatives.

Figure 2: Percentage of 11th grade students meeting or exceeding the scaled score of 2543 (SBAC Level 2) for math.

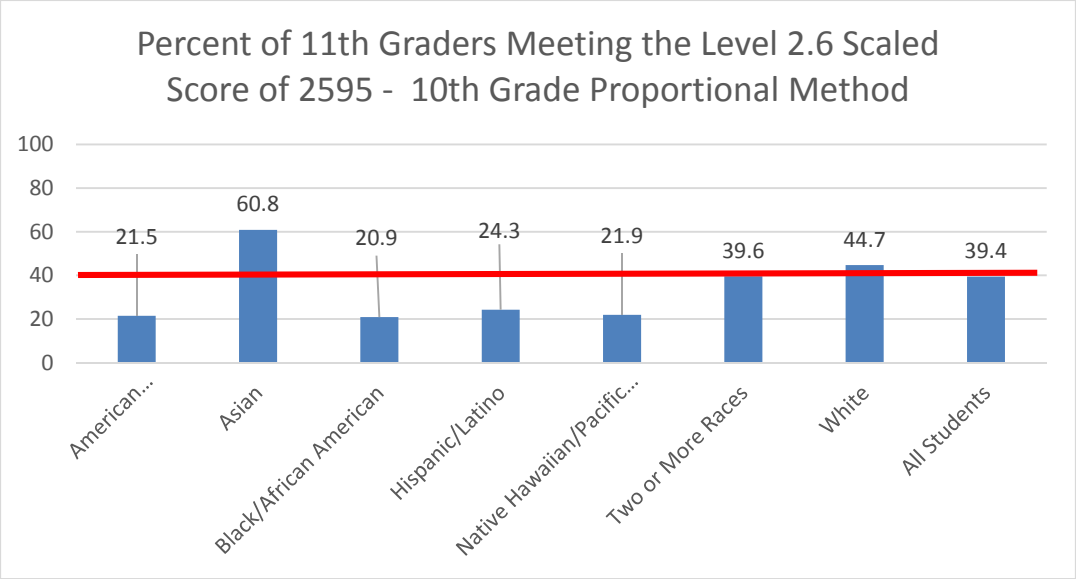


Method 3: Option 3

Level 2.6 Math Scaled Score Option

As an option for the Board, a scaled score of 2595 was calculated based on the performance of the 10th grade students on the SBAC ELA. To describe briefly, an equal impact scaled score was developed based on the 10th Grade SBAC ELA results and that ELA scaled score was approximately 62 percent of the distance between the Level 2 and Level 3 thresholds and that value is informally characterized as Level 2.6. A proportional value was calculated for the math scale and the corresponding scaled score was 2595. In other words, a value a little more than half way between the Level 2 and Level 3 threshold scores.

Figure 3: Percentage of 11th grade students meeting or exceeding the scaled score of 2595 for math.



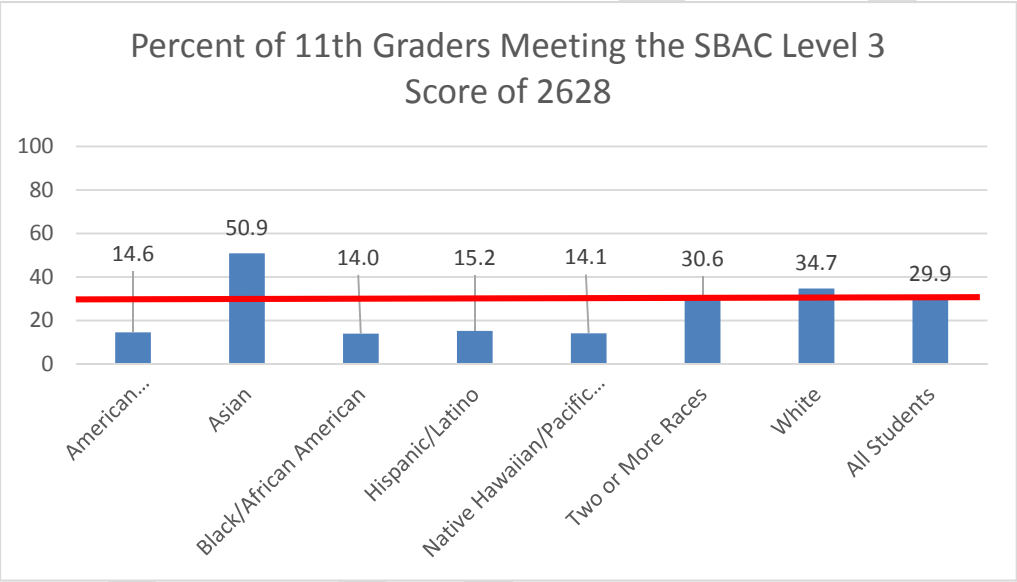
When the scaled score of 2595 is applied to the 11th Grade SBAC results, 39.4 percent of the 11th grade test takers met or exceeded the scaled score (Chart 3). This is far below the 75 percent meeting the benchmark on the Math EOCs.

Method 4: Option 4

Level 3 Math Scaled Score Option

The most rigorous of the scaled score for graduation options is a scaled score of 2628 that represents the SBAC Level 3 threshold. When this scaled score is applied to the 11th grade results, approximately 29.9 percent of the students met the benchmark (Figure 4). If this score was to be adopted a very large number of 11th grade students would fail to meet this graduation benchmark and be required to retest or meet graduation requirements through one of the currently approved alternatives.

Figure 4: Percentage of 11th grade students meeting or exceeding the cut score of 2628 (SBAC Level 3) for math.



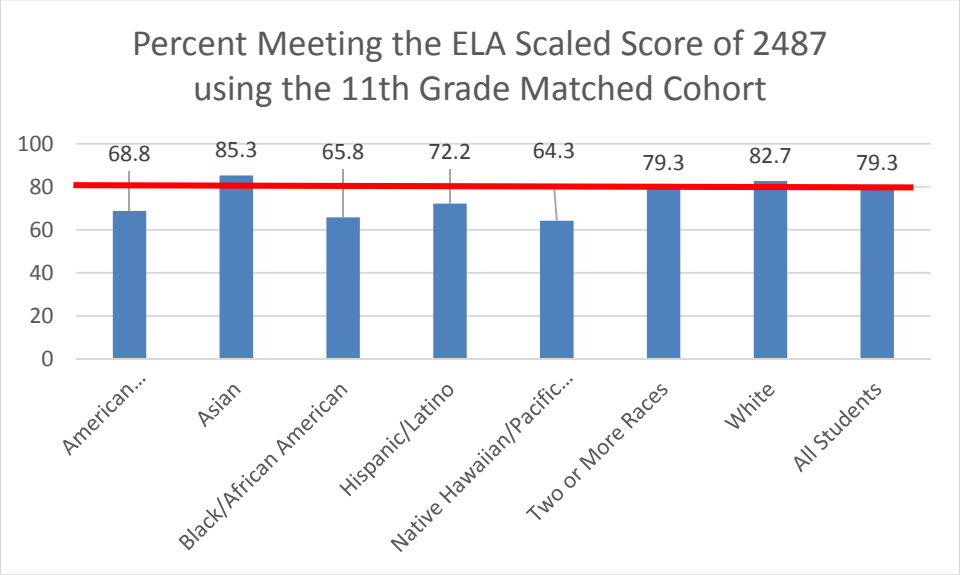
11th Grade ELA

Method 1: Option 5

Matched Cohort Design

Based on the prior score history of the matched cohort, the methodology or design targeted a pass rate of approximately 79 percent. When the equal impact scaled score of 2487 is applied to the 11th grade student results, approximately 79.3 percent meet or exceed the scaled score and that compares favorably to the OSPI targeted rate. Figure 5 shows that the percent meeting or exceeding the equal impact scaled score varies considerably by race and ethnicity. By design, the equal impact identifies a score that results in an equal percentage of students meeting the target; in this case, the All Students group. So, the design achieved the desired goal.

Figure 5: Percentage of 11th grade students meeting or exceeding the equal impact scaled score for ELA as determined by the equal impact, matched cohort, design.

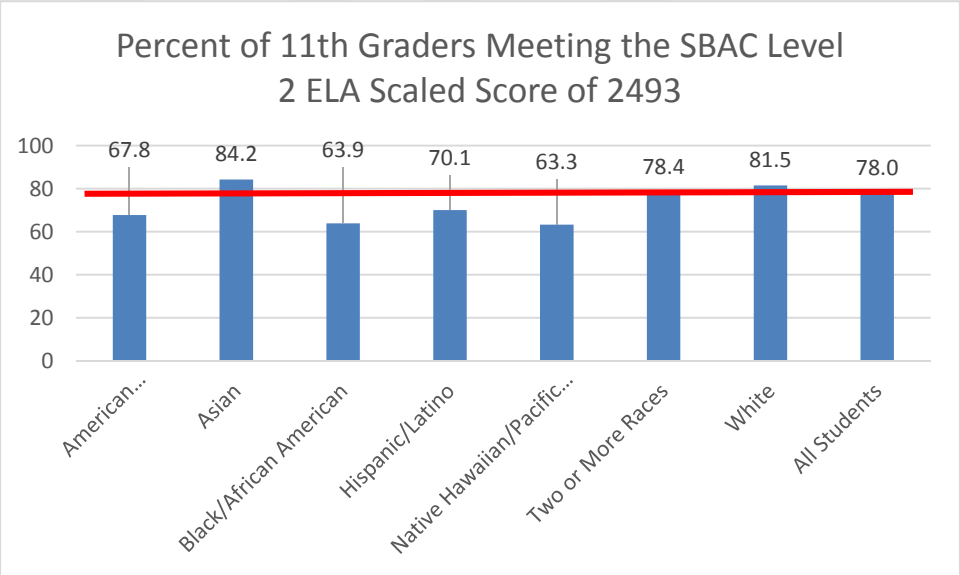


Method 2: Option 6

Level 2 ELA Scaled Score Option

When the SBAC ELA Level 2 threshold scaled score of 2493 is applied to the 11th grade assessment results, approximately 78 percent of the 11th grade test takers met or exceeded the benchmark. This rate is very close to the targeted rate because the scaled score is very similar to and slightly higher than the equal impact scaled score (Figure 6).

Figure 6: Percentage of 11th grade students meeting or exceeding the scaled score of 2493 (SBAC Level 2) for ELA.

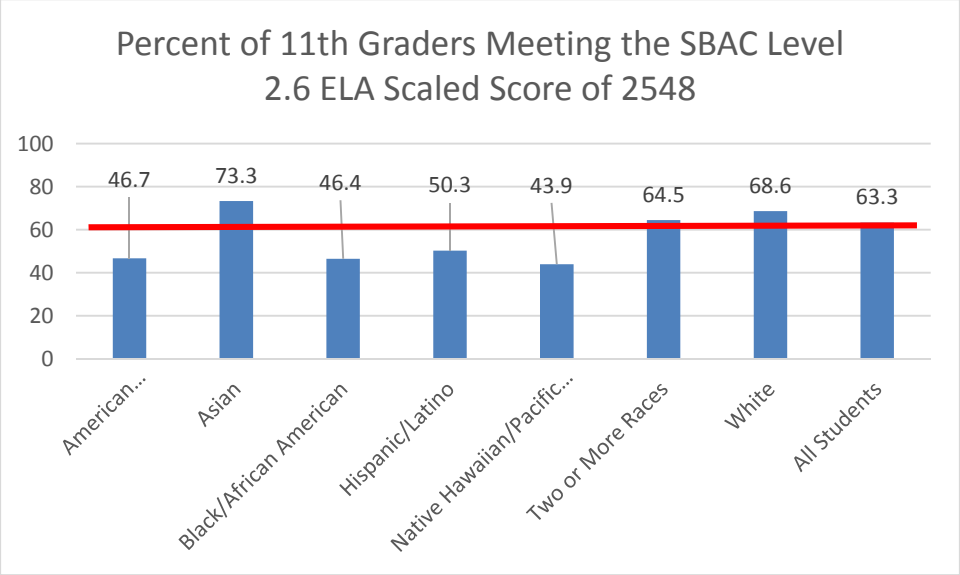


Method 3: Option 7

Level 2.6 ELA Scaled Score Option

The methodology for calculating the Level 2.6 score was described briefly in the section discussion the math results and need not be repeated here. The Level 2.6 benchmark corresponds to an ELA scaled score of 2548. When that scaled score is applied to the 11th Grade SBAC ELA student results, approximately 63.3 percent of 11th graders meet or exceed the benchmark (Figure 7). This rate is approximately 15 percentage points lower than the targeted rate and if adopted, would result in a substantial number of 11th grade students retesting or meeting graduation requirements through an approved alternative.

Figure 7: Percentage of 11th grade students meeting or exceeding the scaled score of 2548 (Level 2.6) for ELA.



Method 4: Option 8

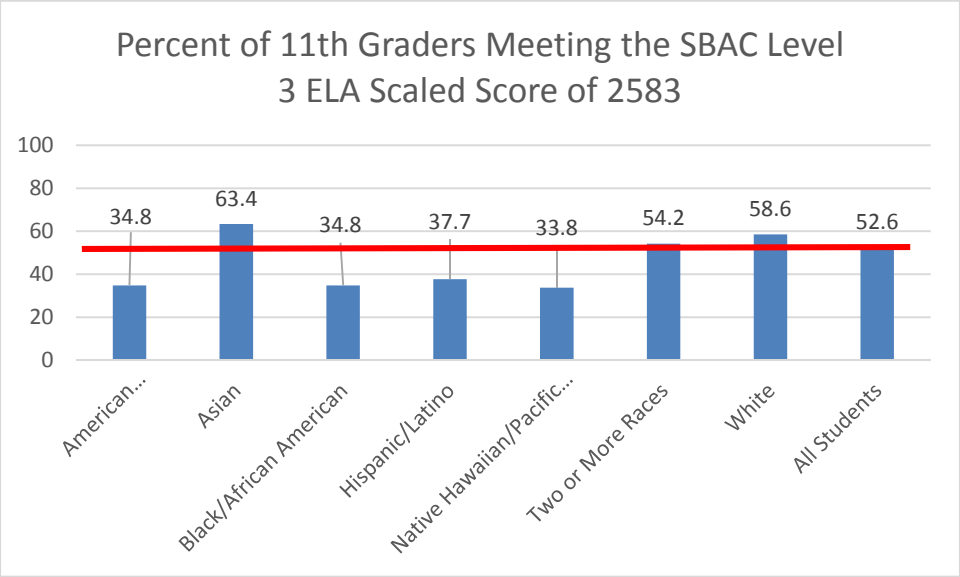
Level 3 ELA Scaled Score Option

As was the case for the math cut score options, the Level 3 option is the most rigorous and results in the lowest success rates. If this scaled score was to be adopted as the score needed to earn a CAA, a success rate of approximately 52.6 percent would be achieved (Figure 8). This is more than 25 percentage points lower that the targeted rate used in the matched cohort equal impact option. If adopted, slightly less than one half of all 11th graders would fail to meet the graduation scaled score and would be required to retest or meet this graduation requirement through an approved alternative.

10th Grade ELA

This work considered three possible graduation cut scores for the HS SBAC ELA: the Level 2 threshold point of 2493, the Level 3 threshold point of 2583, and the recommended scaled core of 2548 based on the OSPI equal impact methodology. Each are discussed separately in the paragraphs that follow.

Figure 8: Percentage of 11th grade students meeting or exceeding the scaled score of 2583 (SBAC Level 3) for ELA.

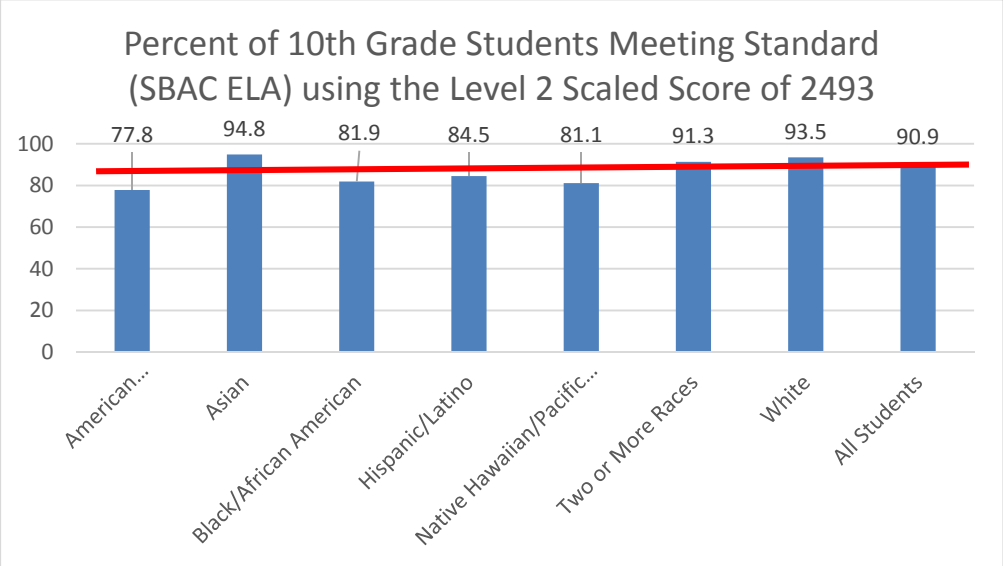


Method 2: Option 9

Level 2 ELA Scaled Score Option

The Level 2 threshold corresponds to a scaled score of 2493 on the HS SBAC ELA, as derived through the standard setting process by the consortium and based on the 2013-14 SBAC Field Test. Figure 9 shows that if the ELA graduation scaled score of 2943 was to be adopted, approximately 90.9 percent of the assessed population would meet or exceed that benchmark. Based on the three most recent years, approximately 80.1 percent of 10th grade students met or exceeded the graduation scaled score the HSPE in Reading and Writing that is required to earn a CAA. When collectively considering all students, the adoption of the Level 2 scaled score might be viewed or characterized as “lowering standards” or “lowering expectations” because substantially more students would be expected to meet the graduation benchmark as a first-time test taker.

Figure 9: Shows the percentage of 10th graders meeting the Level 2 scaled score of 2493 on the HS SBAC ELA.

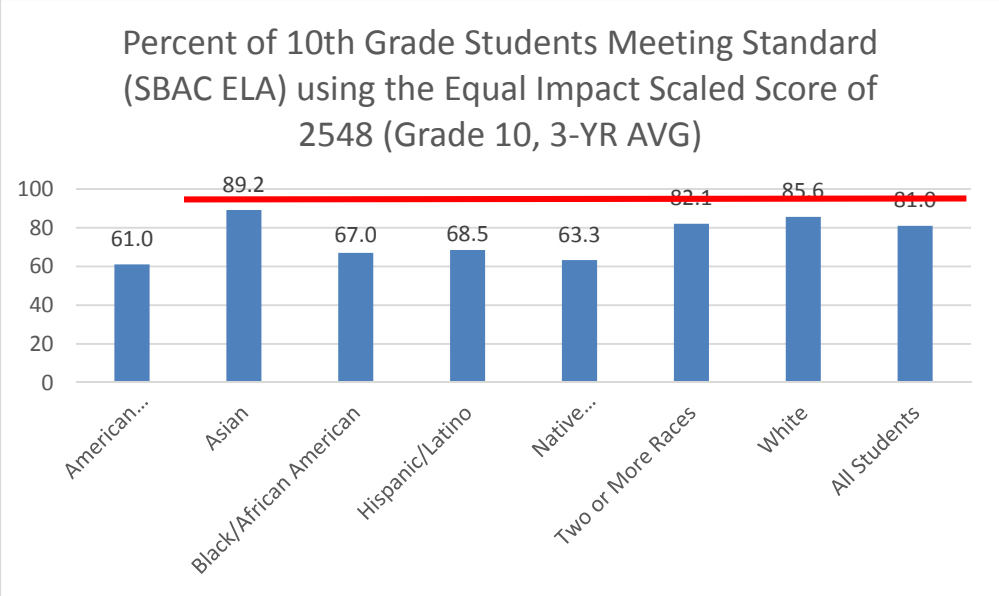


Method 3: Option 10

Level 2.6 ELA Scaled Score Option

Using an equal impact methodology, a balance is sought whereby a scaled score is identified that results in an equal percentage of students meeting the benchmark on the new assessment as compared to the previous assessment. The OSPI determined the equal impact level to correspond to a HS SBAC ELA scaled score of 2548. The Level 2.6 scaled score results in approximately 81.0 percent of first-time 10th grade test takers meeting the graduation benchmark (Figure 10), which compares favorably to the 80.1 percent meeting the benchmark on the HSPE Reading and Writing. If the Level 2.6 cut was to be adopted, stakeholders would view the standards as remaining "about the same as before."

Figure 10: Shows the percentage of 10th graders meeting the Level 2.6 scaled score of 2548 on the HS

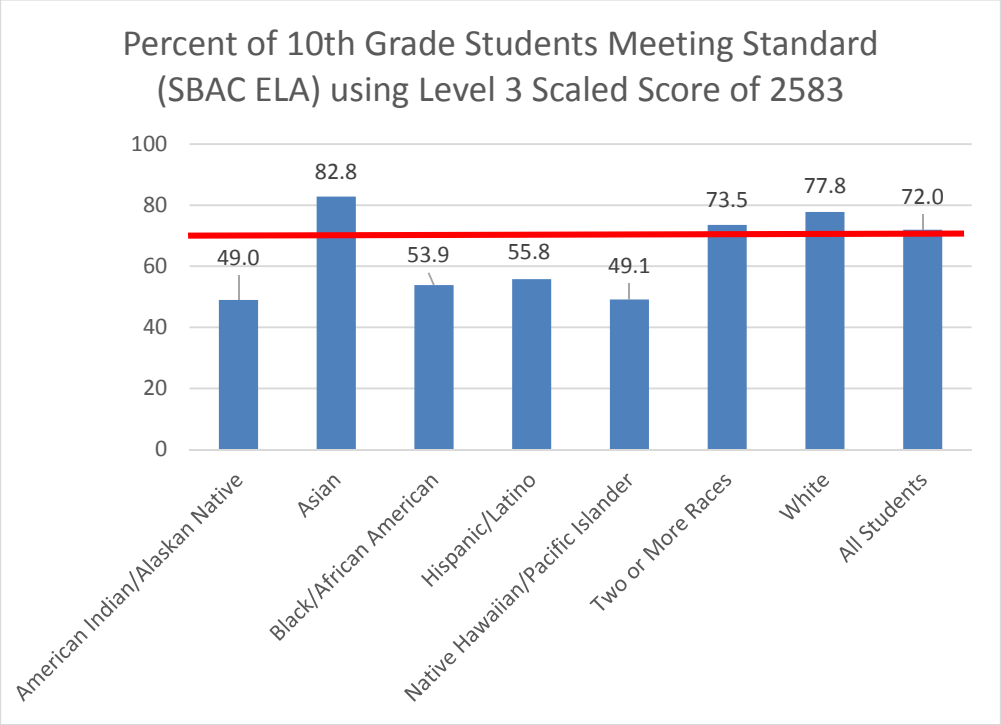


Method 4: Option 11

Level 3 ELA Scaled Score Option

The Level 3 graduation requirement score corresponds to an HS SBAC ELA scaled score of 2583 per the standard setting based on the 2013-14 SBAC Field Test. Figure 11 shows that if the ELA graduation requirement was to be set at the Level 3 scaled score of 2583, approximately 72.0 percent of the assessed population would meet or exceed that threshold. This is approximately 7.9 percentage points lower than the three-year average of the percent of 10th grade students met or exceeded the graduation required score for the HSPE in Reading and Writing. The adoption of the Level 3 scaled score might be viewed as "increasing standards" or making it "more difficult" for students to meet graduation requirements because substantially fewer students would be expected to meet the graduation threshold as a first-time test taker.

Figure 11: Shows the percentage of 10th graders meeting the SBAC ELA Level 3 scaled score of 2583.



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