EXHIBIT A

Introduction

This study reviewed longitudinal data on Tucson Unified School District (TUSD) student academic performance on the Arizona Measurement of Educational Readiness to Inform Teaching or AzMERIT, disaggregated by grade-level and by ethnicity. Student performance in AzMERIT English Language Arts (ELA) and Mathematics (Math) was examined for students who were continuously enrolled in TUSD from the 3rd grade through the 7th grade beginning in the SY 2014-2015 and continuing through the SY 2018-2019. This timeframe captures the cohort of TUSD students who were assessed with the first implementation of the 3rd Grade AzMERIT during SY 2014-2015 and follows them over next five school years through the SY 2018-2019. To be included in this longitudinal cohort, students needed 5 years of AzMERIT results in ELA and/or Math.

Comparison of the AzMERIT Percent Proficiency by Grade and Ethnicity

In the SY 2014-2015, 3,743 TUSD students took the 3rd grade AzMERIT ELA exam, of whom 2,062 remained continuously enrolled in TUSD schools over the next five school years and took the AzMERIT each spring. In SY 2014-2015, 3,762 students took the 3rd grade AzMERIT Math exam and 2,086 of those students remained in the school district over this five-year span with AzMERIT scores each year. Please see Appendix 1 for a breakdown of this data by grade and subject. Among this cohort, ELA mean percent proficiency increased from 3rd grade (32.8%) to 4th grade (39.9%), then declined in both 5th (35.2%) and 6th grades (26.0%) and finally improved somewhat in the 7th grade

(29.3%). On the AzMERIT math exam, 3rd grade (34.9%) and 4th grade (34.8%) mean percent proficiency was very similar. In 5th grade, scores increased (41.0%), and then declined in both 6th grade (27.8%) and 7th grades (24.7%). Overall, cohort performances of African-American, Asian/PI-American, Hispanic, Multi-Racial, Native-American and White students conformed to this pattern of improvement in the elementary grades then a decline in the middle school grades in the mean percent proficiency.

Scale Score Analysis using BOX and WHISKERS

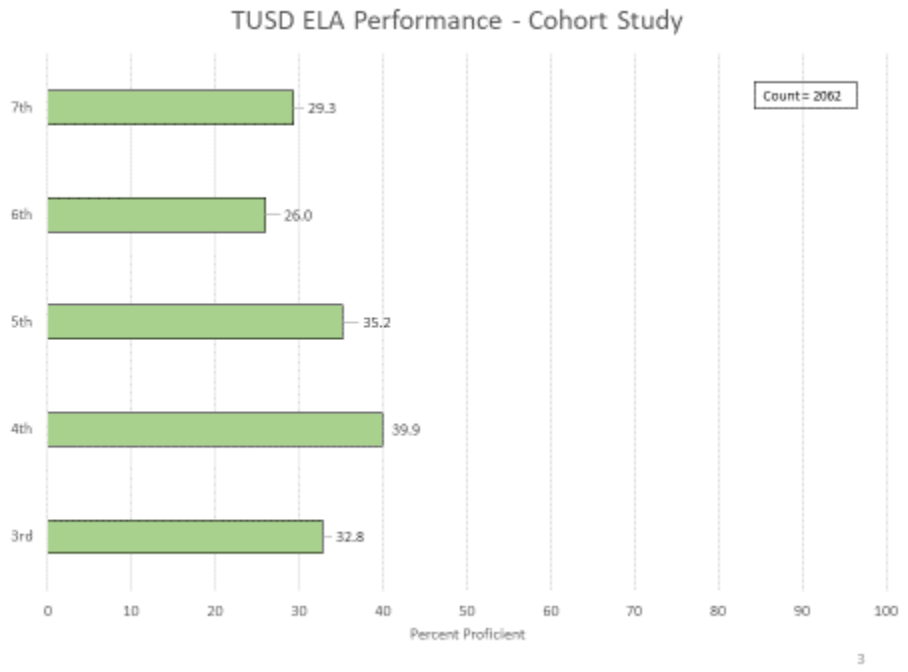
The Box and Whiskers analysis compared ELA and Math AzMERIT performance among this cohort using median scale scores. Please see Appendix 2 for a breakdown of the results by grade and subject. This view illustrates that African-American and Hispanic students performed similarly in their score distributions and median scale scores. Additionally, in the bottom left corner of each grade level, a t-test was conducted to assess if the mean scale scores for each ethnicity was significantly different when compared to White performance within each grade. For all grade-level tests, African-American and Hispanic students' mean scale scores were significantly lower than those of White students. However, this t-test data also revealed an interesting trend across grades when comparing the mean ELA scale scores. African American, Hispanic, and White students all showed very similar changes in the mean scale score year over year for 5 years. The average mean ELA scale score difference over 5 years for African-American was 10.8. Hispanic and White students ELA scale score differences were fundamentally equivalent (11.5 points and 11.8 points respectively) to African American mean ELA scale score differences. In other words, change over time in terms of mean scale scores does not vary much by ethnicity.

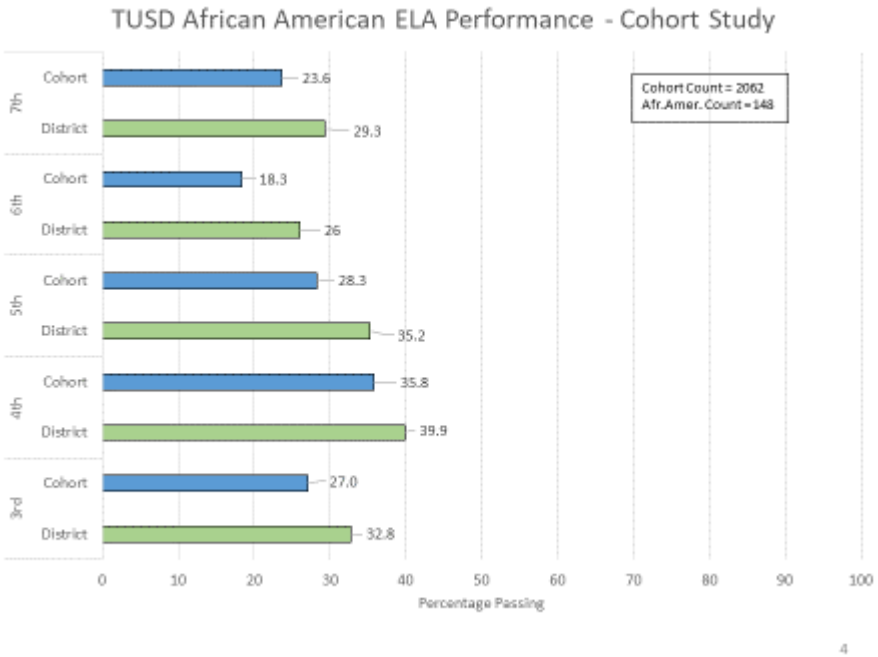
When African-American and Hispanic students' math scale scores were compared against White students, African-American and Hispanic students' mean scale scores were also statistically lower than White students across all grade-levels. Similar to the trends that were evident with ELA scores, math scale score change over time was equivalent across ethnicities. African-American (27.1 points) and Hispanic (26.6 points) students average yearly change over 5 years in math scale scores were comparable to that of White students (28.5 points).

Summary

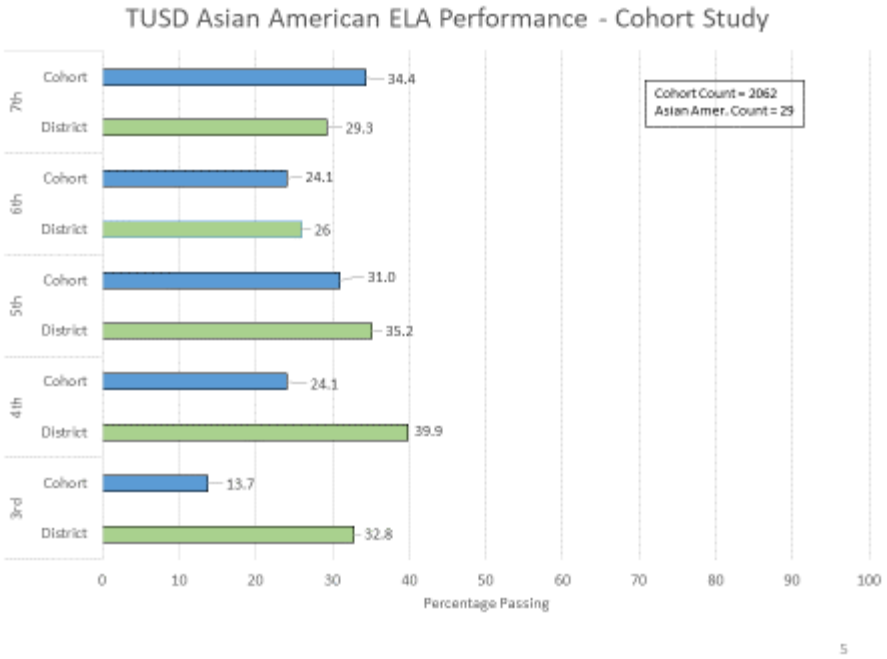
In summary, by 3rd grade, an academic gap already exists in percent proficiency between African American and Hispanic students when compared to White students. The gap that was evident in 3rd grade between African-American and Hispanic students when compared to White students persisted to the 7th grade in both ELA & Math. In both subjects, each ethnicity show the same trend of overall increases in elementary school followed by decreases in middle school in percent proficiency. The Box and Whiskers analysis of AzMERIT scale scores in ELA & Math demonstrates that African-American and Hispanic students' performance is statistically significantly lower than White students across all grade-levels. However, the annual yearly change in mean scale scores of African-American and Hispanic students is comparable to White students in both ELA & Math. Additionally, it appears that the gap did not dramatically increase or decrease because the mean scale score changes year over year between the different ethnicities were fundamentally equivalent.

Appendix 1


TUSD ELA Performance - Cohort Study
Count = 2062
7th
29.3
6th
26.0
5th
35.2
4th
39.9
3rd
32.8
0
10
20
30
40
50
60
70
80
90
100
Percent Proficient
3


TUSD African American ELA Performance - Cohort Study
Cohort Count = 2062
Afr.Amer. Count = 148
7th
Cohort
23.6
District
29.3
6th
Cohort
18.3
District
26
5th
Cohort
28.3
District
35.2
4th
Cohort
35.8
District
39.9
3rd
Cohort
27.0
District
32.8
0
10
20
30
40
50
60
70
80
90
100
Percentage Passing
4

TUSD COHORT STUDY OVER 5 YEARS USING AZMERIT SCORES 2014-15 TO 2018-19 BROKEN OUT BY ETHNICITY



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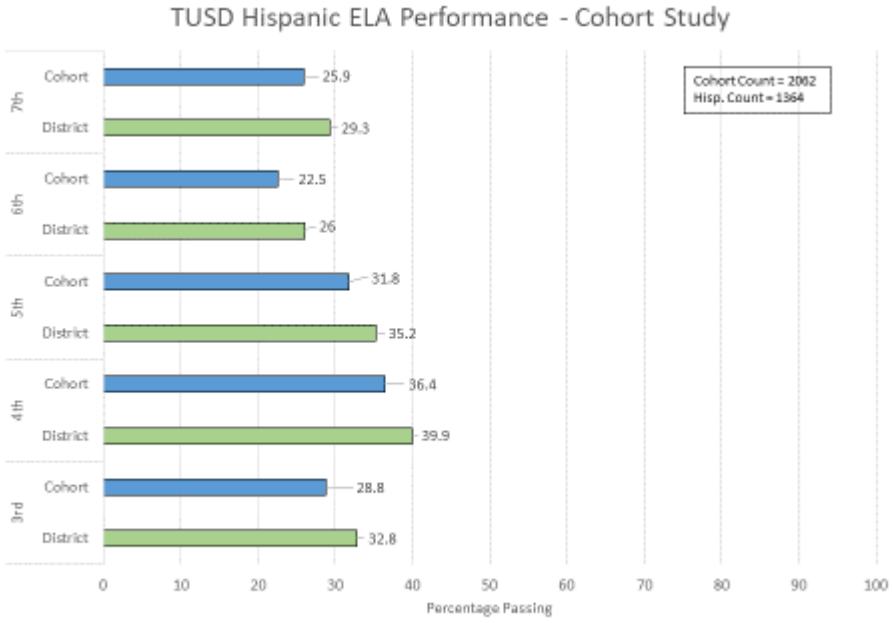

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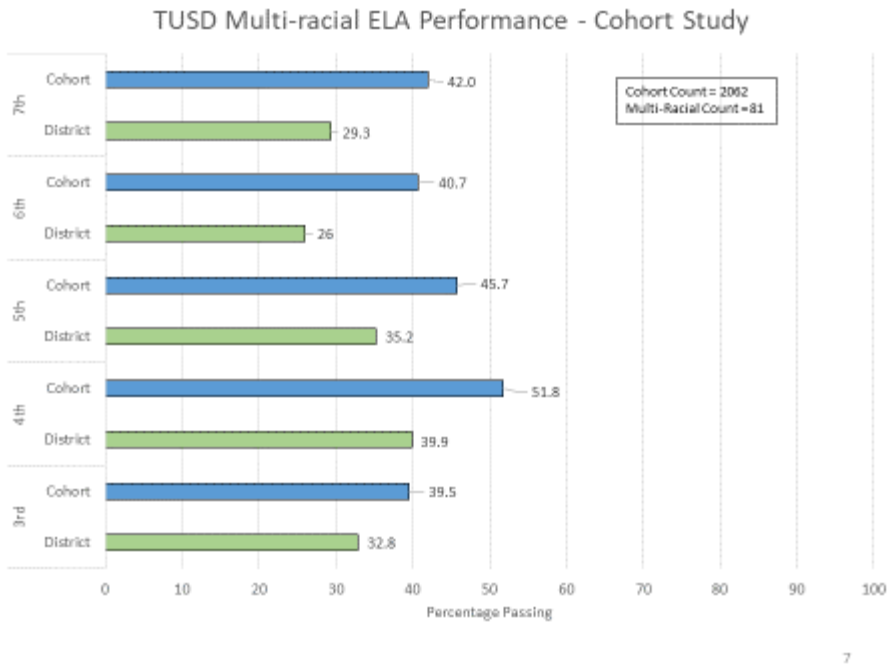
TUSD COHORT STUDY OVER 5 YEARS USING AZMERIT SCORES 2014-15 TO 2018-19 BROKEN OUT BY ETHNICITY



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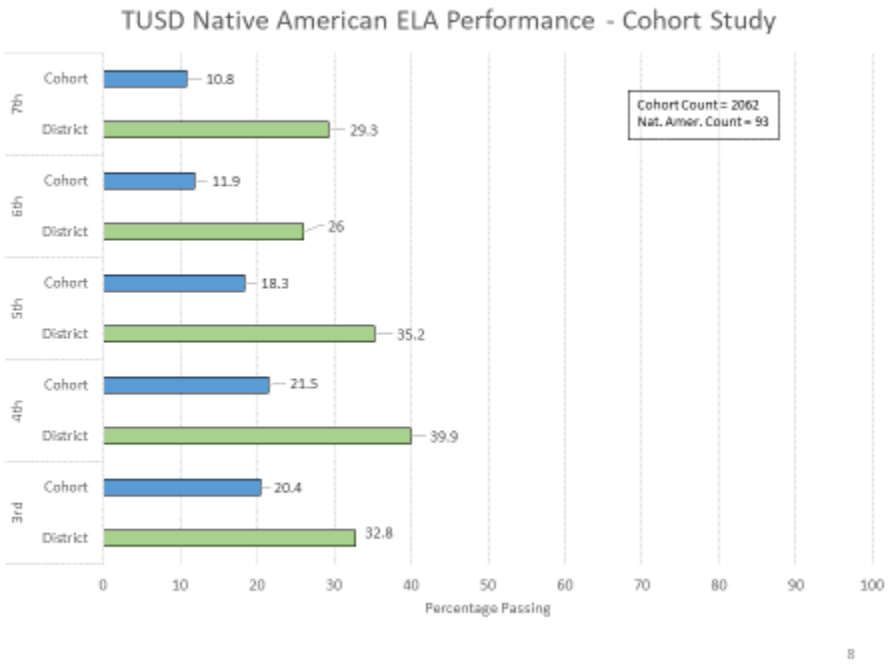

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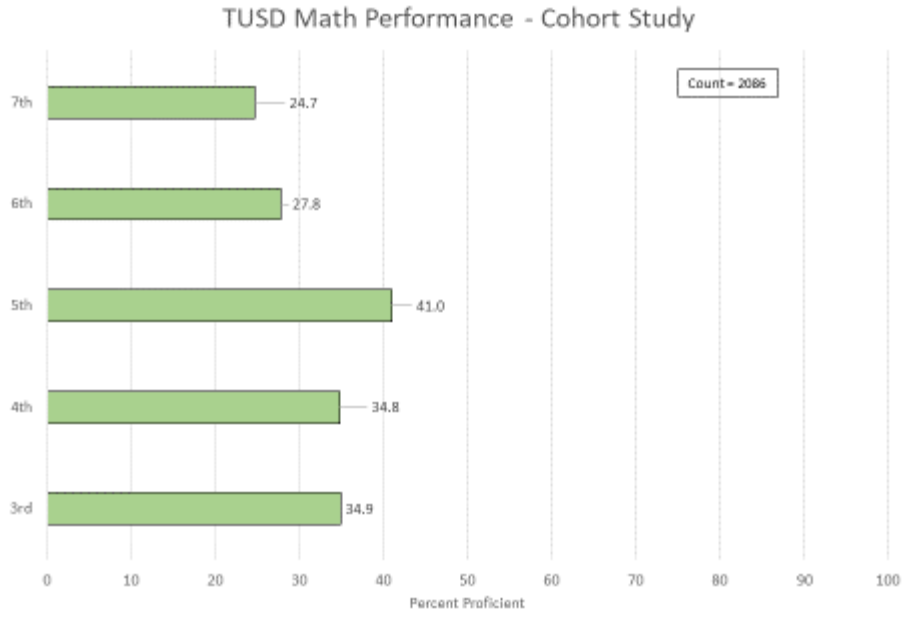
TUSD COHORT STUDY OVER 5 YEARS USING AZMERIT SCORES 2014-15 TO 2018-19 BROKEN OUT BY ETHNICITY

9



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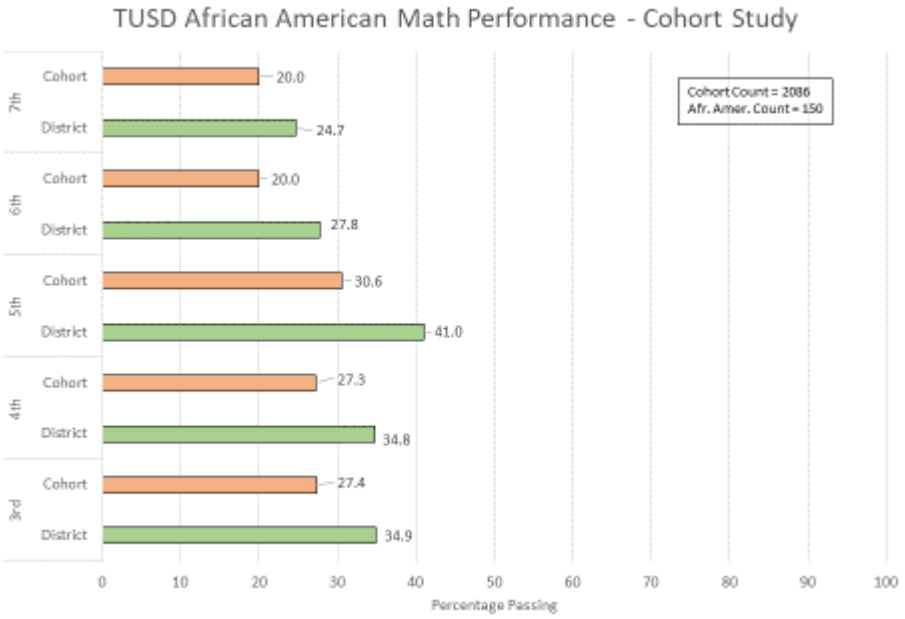
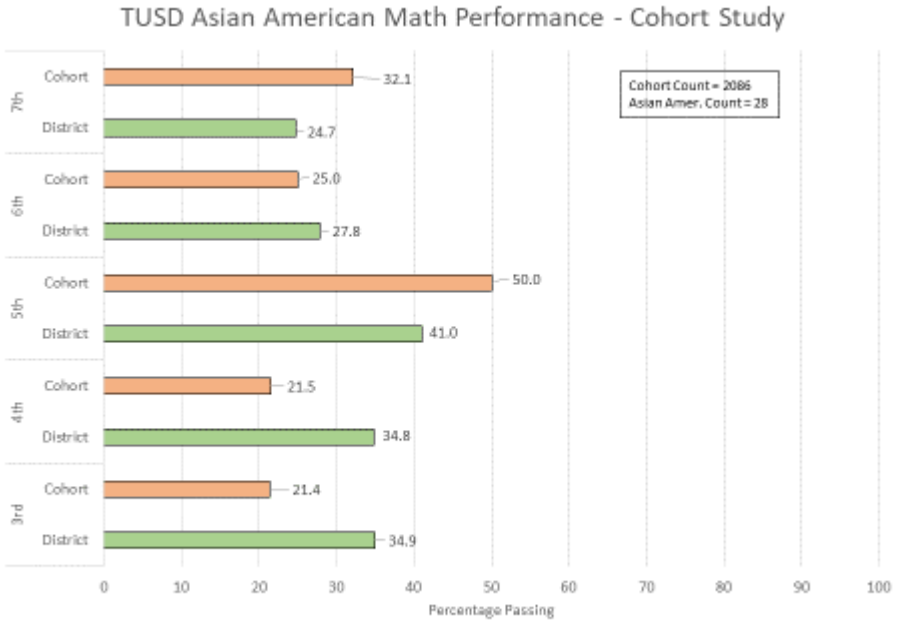
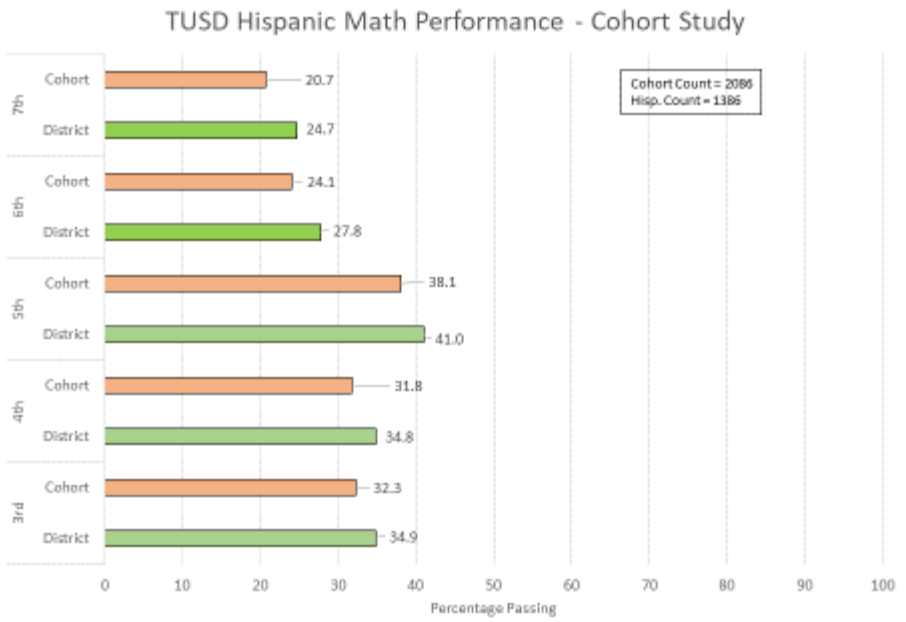

TUSD African American Math Performance - Cohort Study
Cohort Count = 2086
Afr. Amer. Count = 150
7th
Cohort
20.0
District
24.7
6th
Cohort
20.0
District
27.8
5th
Cohort
30.6
District
41.0
4th
Cohort
27.3
District
34.8
3rd
Cohort
27.4
District
34.9
0
10
20
30
40
50
60
70
80
90
100
Percentage Passing

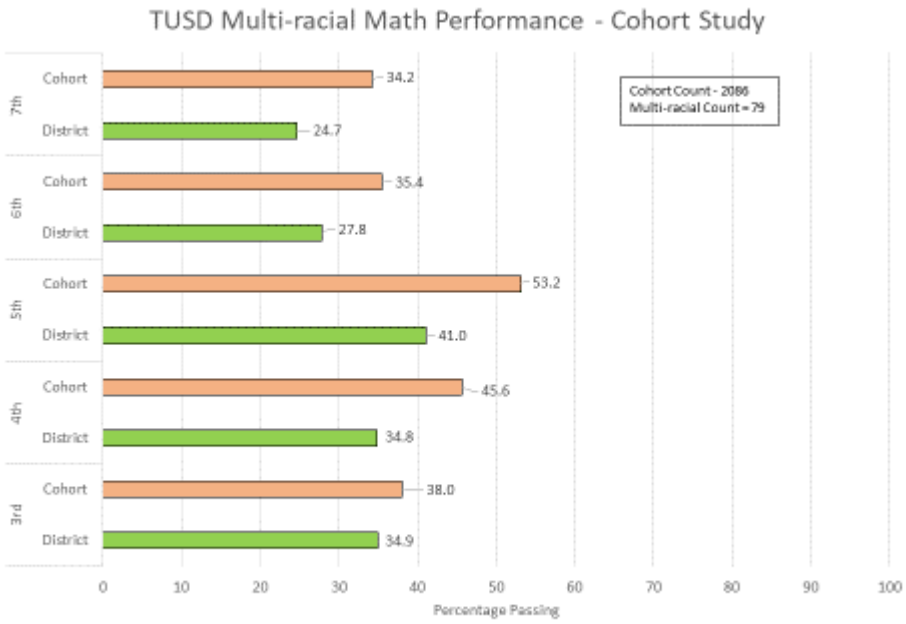
12


TUSD Asian American Math Performance - Cohort Study
Cohort Count = 2086
Asian Amer. Count = 28
7th
Cohort
32.1
District
24.7
6th
Cohort
25.0
District
27.8
5th
Cohort
50.0
District
41.0
4th
Cohort
21.5
District
34.8
3rd
Cohort
21.4
District
34.9
0
10
20
30
40
50
60
70
80
90
100
Percentage Passing

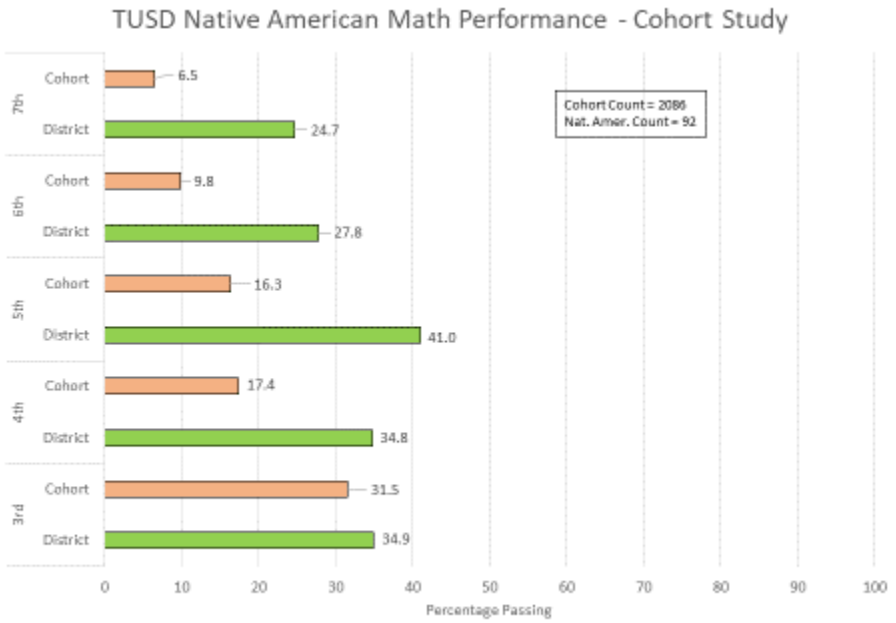
13


TUSD Hispanic Math Performance - Cohort Study
Cohort Count = 2086
Hisp. Count = 1386
7th
Cohort 20.7
District 24.7
6th
Cohort 24.1
District 27.8
5th
Cohort 38.1
District 41.0
4th
Cohort 31.8
District 34.8
3rd
Cohort 32.3
District 34.9
0 10 20 30 40 50 60 70 80 90 100
Percentage Passing

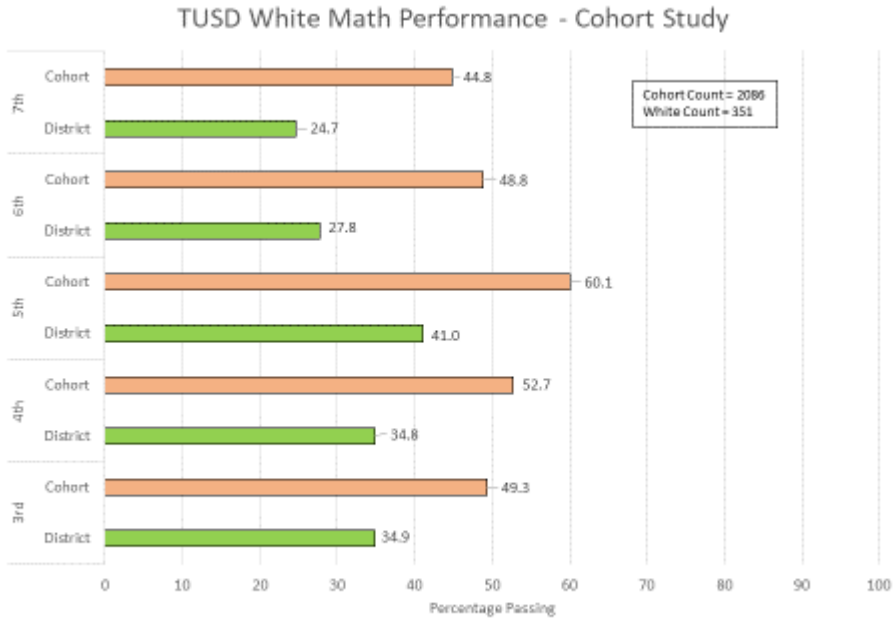
14


TUSD Multi-racial Math Performance - Cohort Study
Cohort Count - 2086
Multi-racial Count = 79
7th
Cohort 34.2
District 24.7
6th
Cohort 35.4
District 27.8
5th
Cohort 53.2
District 41.0
4th
Cohort 45.6
District 34.8
3rd
Cohort 38.0
District 34.9
0 10 20 30 40 50 60 70 80 90 100
Percentage Passing

15


TUSD Native American Math Performance - Cohort Study
Cohort Count = 2086
Nat. Amer. Count = 92
7th
Cohort 6.5
District 24.7
6th
Cohort 9.8
District 27.8
5th
Cohort 16.3
District 41.0
4th
Cohort 17.4
District 34.8
3rd
Cohort 31.5
District 34.9
0 10 20 30 40 50 60 70 80 90 100
Percentage Passing

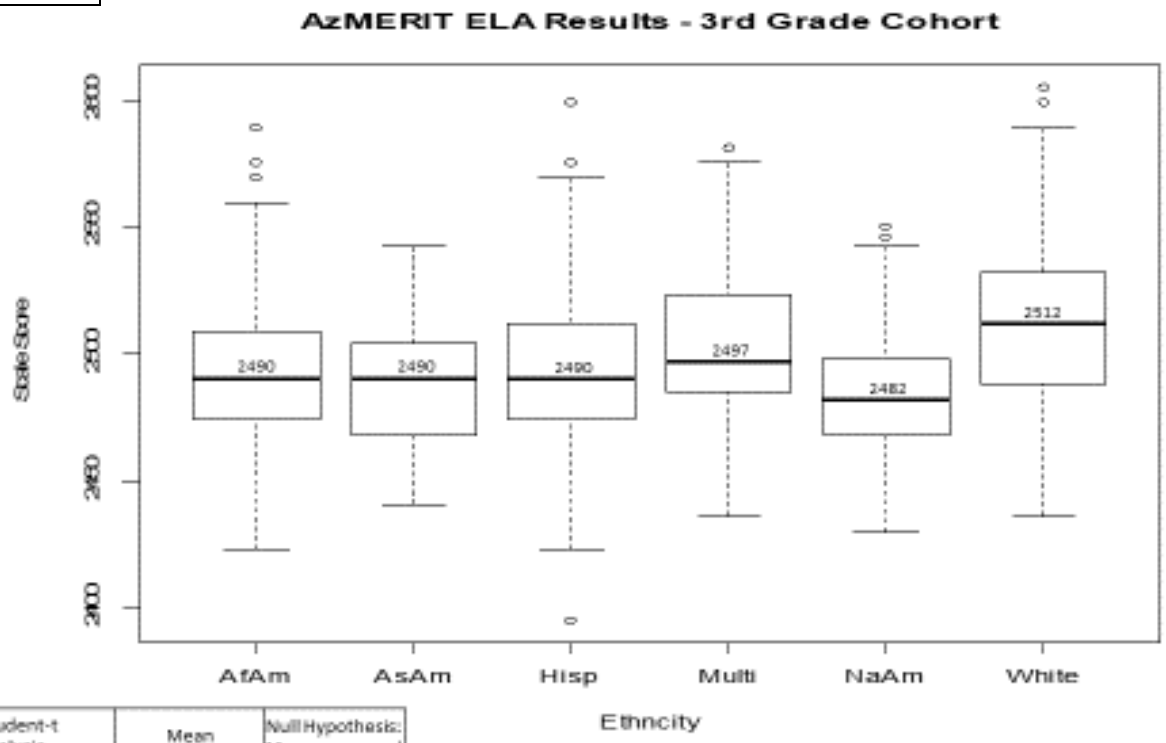
16


TUSD White Math Performance - Cohort Study
Cohort Count = 2086
White Count = 351
7th
Cohort 44.8
District 24.7
6th
Cohort 48.8
District 27.8
5th
Cohort 60.1
District 41.0
4th
Cohort 52.7
District 34.8
3rd
Cohort 49.3
District 34.9
0 10 20 30 40 50 60 70 80 90 100
Percentage Passing

17

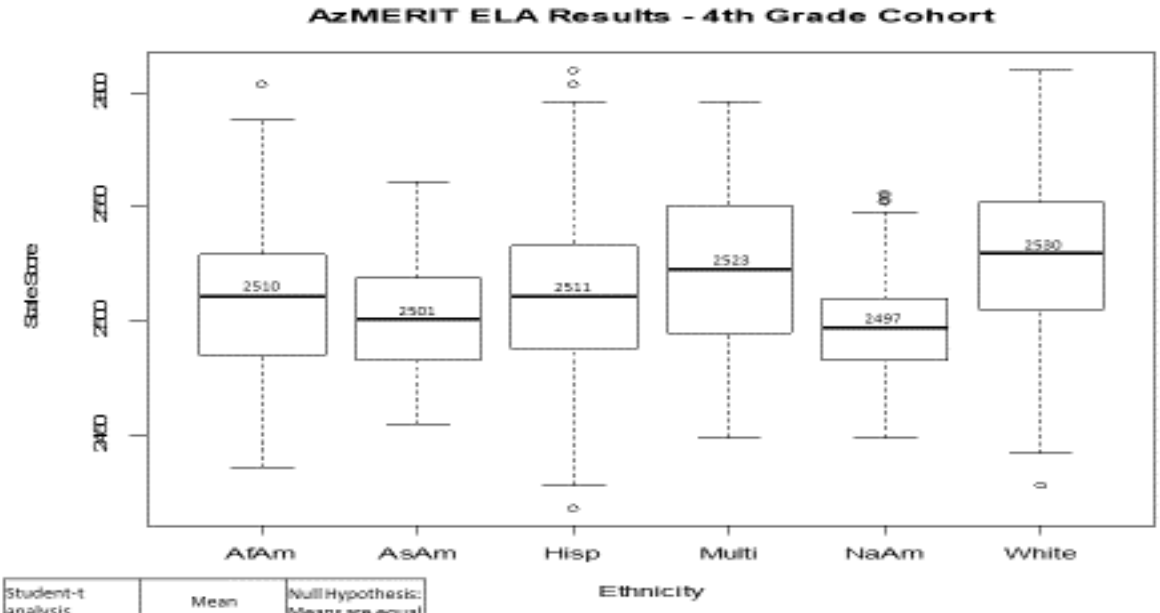
TUSD COHORT STUDY OVER 5 YEARS USING AZMERIT SCORES 2014-15 TO 2018-19 BROKEN OUT BY ETHNICITY

Appendix 2



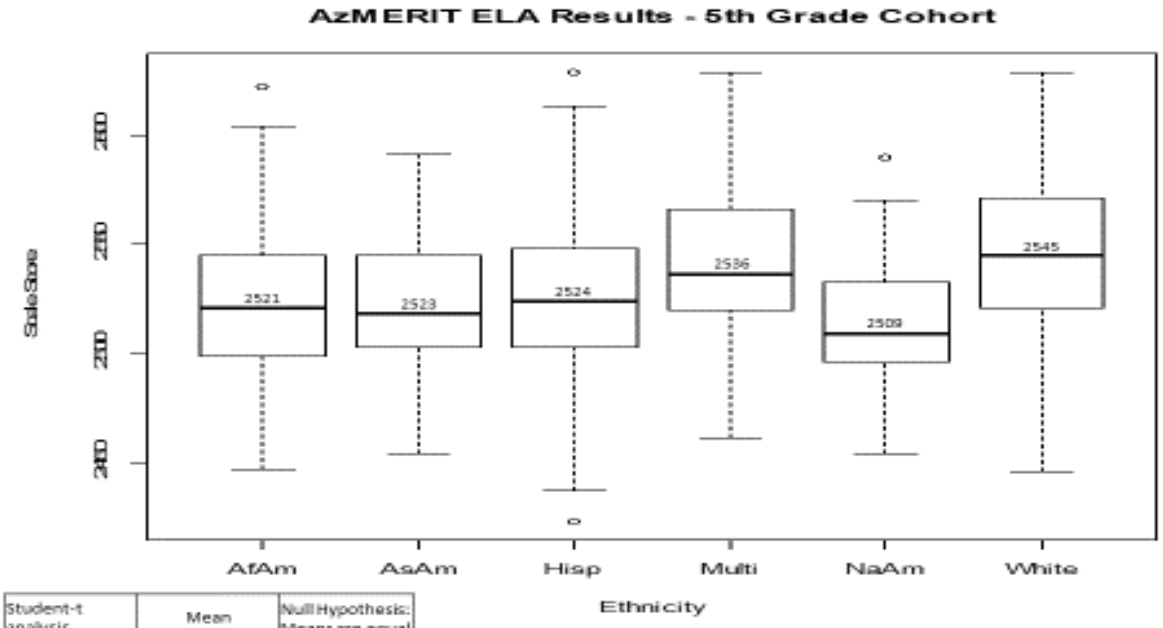
Student-t analysis	Mean	Null Hypothesis: Means are equal
AfAm to White	2493.5 to 2510.1	Reject
AsAm to White	2488.2 to 2510.0	Reject
Hisp to White	2493.8 to 2510.0	Reject
Multi to White	2504.6 to 2510.0	Can't Reject
NaAm to White	2485.9 to 2510.0	Reject

3



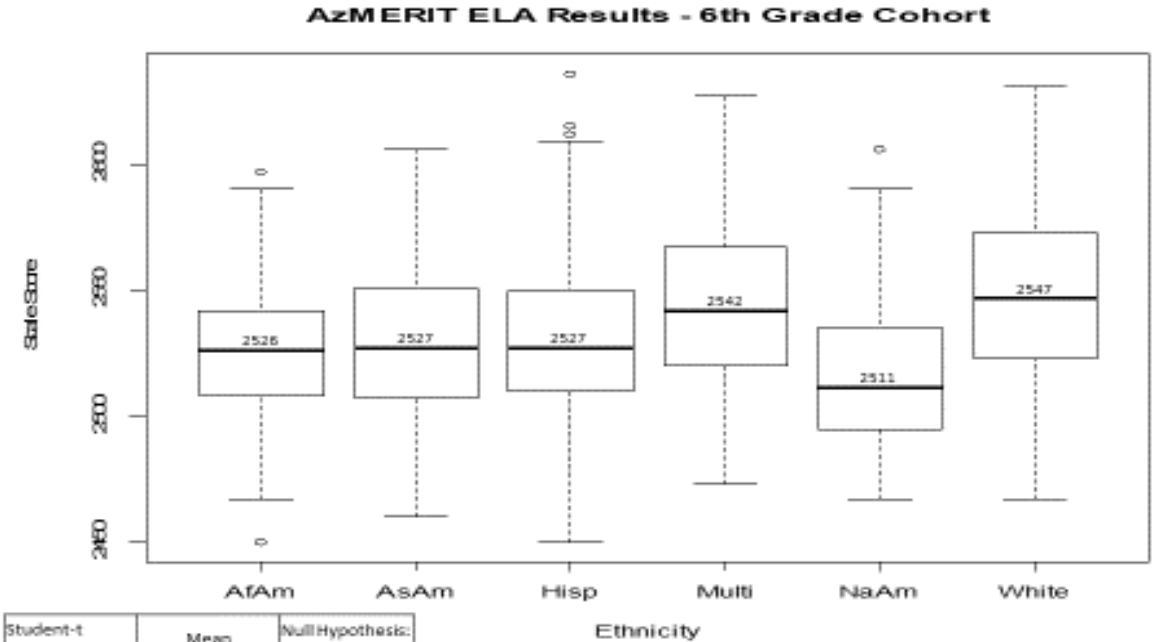
Student-t analysis	Mean	Null Hypothesis: Means are equal
AfAm to White	2509.5 to 2529.4	Reject
AsAm to White	2501.6 to 2529.4	Reject
Hisp to White	2510.6 to 2529.4	Reject
Multi to White	2524.1 to 2529.4	Can't Reject
NaAm to White	2500.0 to 2529.4	Reject

4



Student-t analysis	Mean	Null Hypothesis: Means are equal
AfAm to White	2523.4 to 2544.8	Reject
AsAm to White	2523.0 to 2544.8	Reject
Hisp to White	2527.1 to 2544.8	Reject
Multi to White	2541.5 to 2544.8	Can't Reject
NaAm to White	2513.7 to 2544.8	Reject

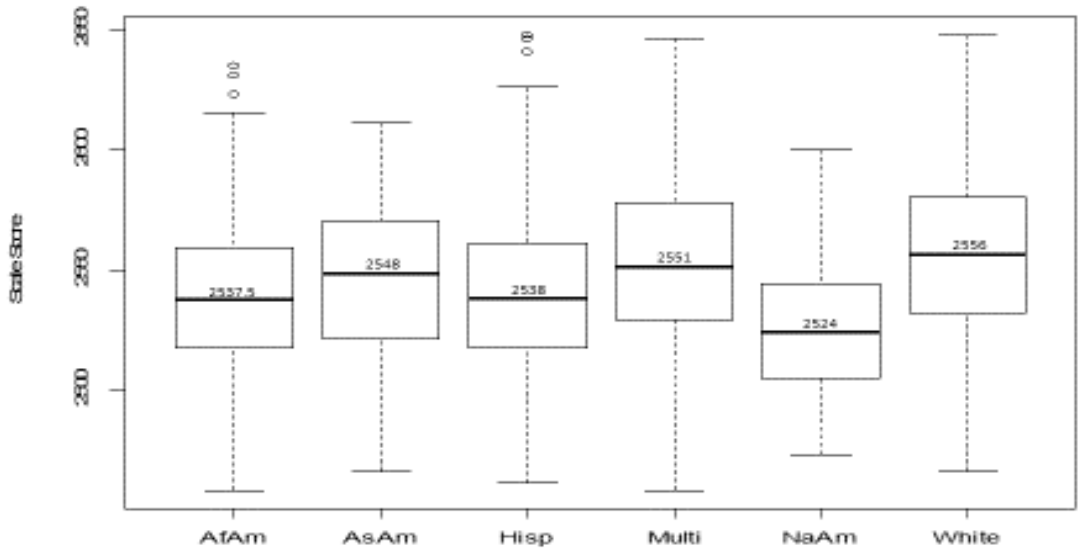
5



Student-t analysis	Mean	Null Hypothesis: Means are equal
AfAm to White	2527.2 to 2546.6	Reject
AsAm to White	2530.1 to 2546.6	Reject
Hisp to White	2530.0 to 2546.6	Reject
Multi to White	2544.3 to 2546.6	Can't Reject
NaAm to White	2516.7 to 2546.6	Reject

6

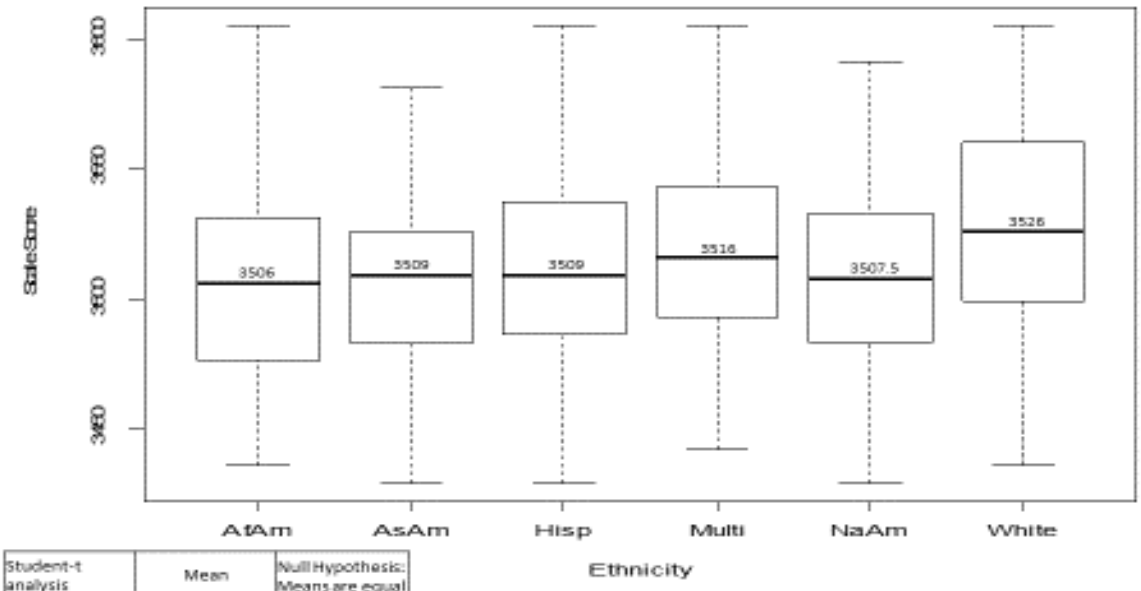
AzMERIT ELA Results - 7th Grade Cohort



Student-t analysis	Mean	Null Hypothesis: Means are equal
AfAm to White	2536.5 to 2557.2	Reject
AsAm to White	2546.2 to 2557.2	Can't Reject
Hisp to White	2539.7 to 2557.2	Reject
Multi to White	2552.9 to 2557.2	Can't Reject
NaAm to White	2525.7 to 2557.2	Reject

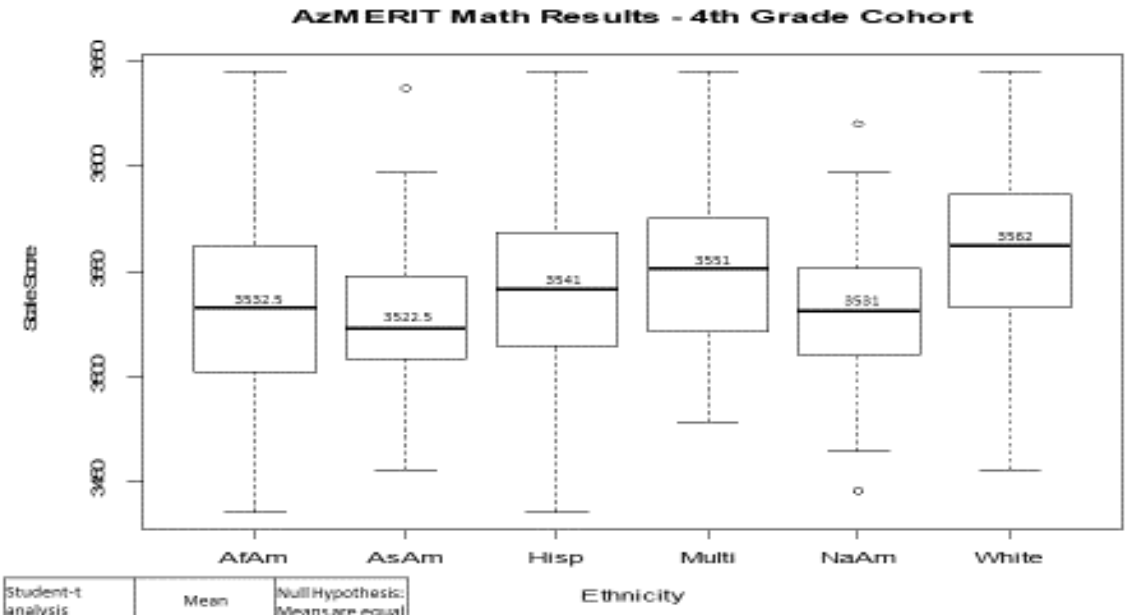
7

AzMERIT Math Results - 3rd Grade Cohort



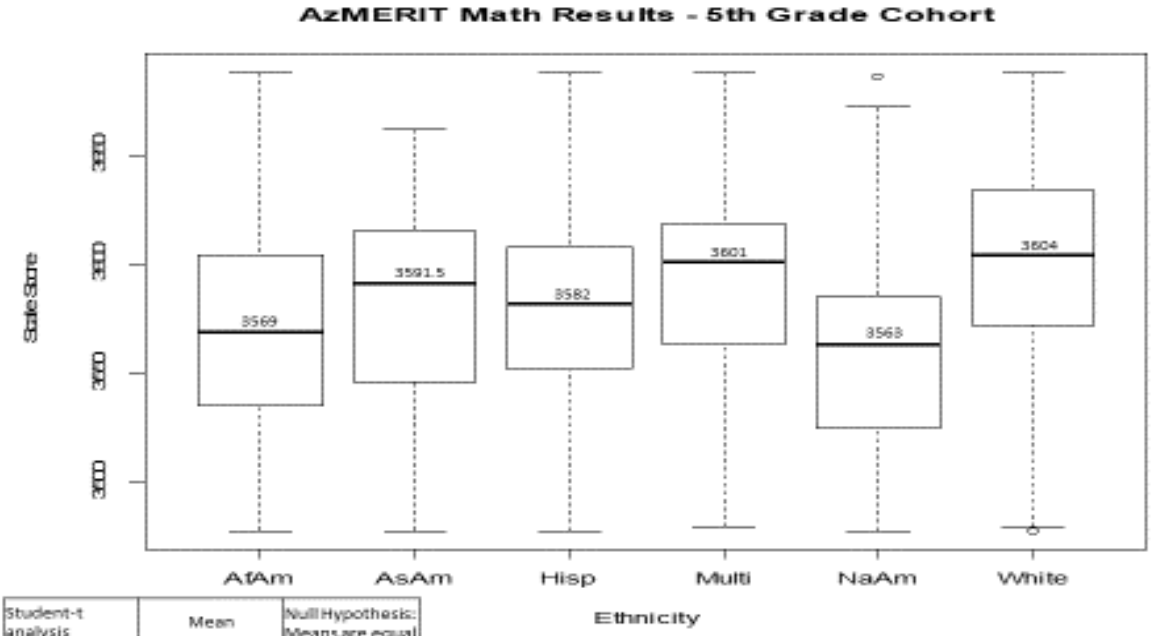
Student-t analysis	Mean	Null Hypothesis: Means are equal
AfAm to White	3506.6 to 3529.2	Reject
AsAm to White	3508.1 to 3529.2	Reject
Hisp to White	3512.1 to 3529.2	Reject
Multi to White	3521.0 to 3529.2	Can't Reject
NaAm to White	3508.7 to 3529.2	Reject

9



Student-t analysis	Mean	Null Hypothesis: Means are equal
AfAm to White	3532.4 to 3559.5	Reject
AsAm to White	3531.1 to 3559.5	Reject
Hisp to White	3540.6 to 3559.5	Reject
Multi to White	3552.0 to 3559.5	Can't Reject
NaAm to White	3529.3 to 3559.5	Reject

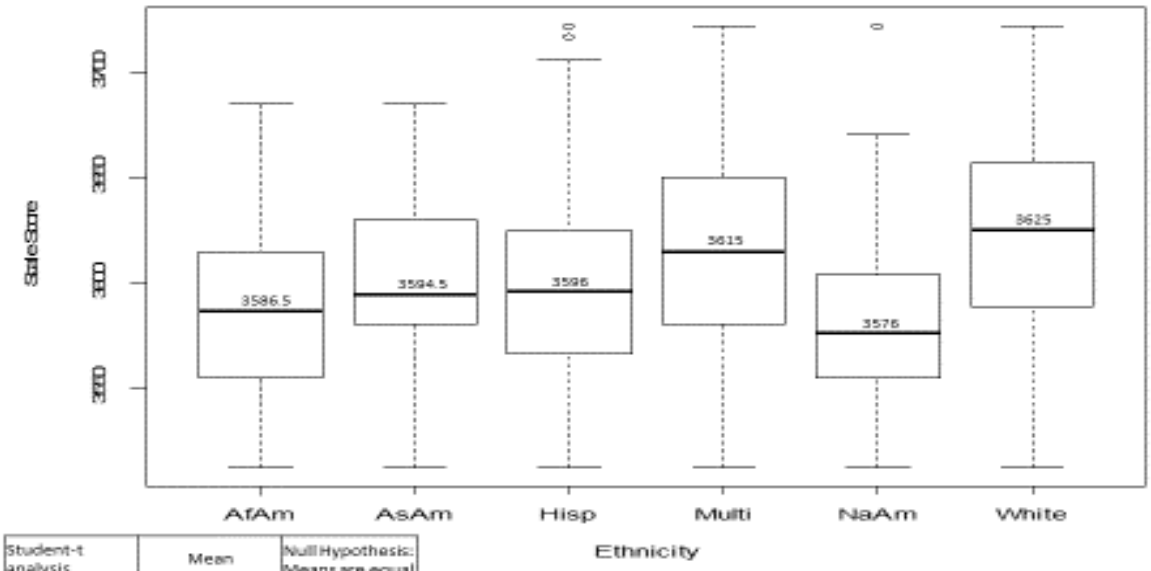
10



Student-t analysis	Mean	Null Hypothesis: Means are equal
AfAm to White	3570.6 to 3601.5	Reject
AsAm to White	3586.0 to 3601.5	Cannot Reject
Hisp to White	3580.0 to 3601.5	Reject
Multi to White	3593.9 to 3601.5	Can't Reject
NaAm to White	3558.1 to 3601.5	Reject

11

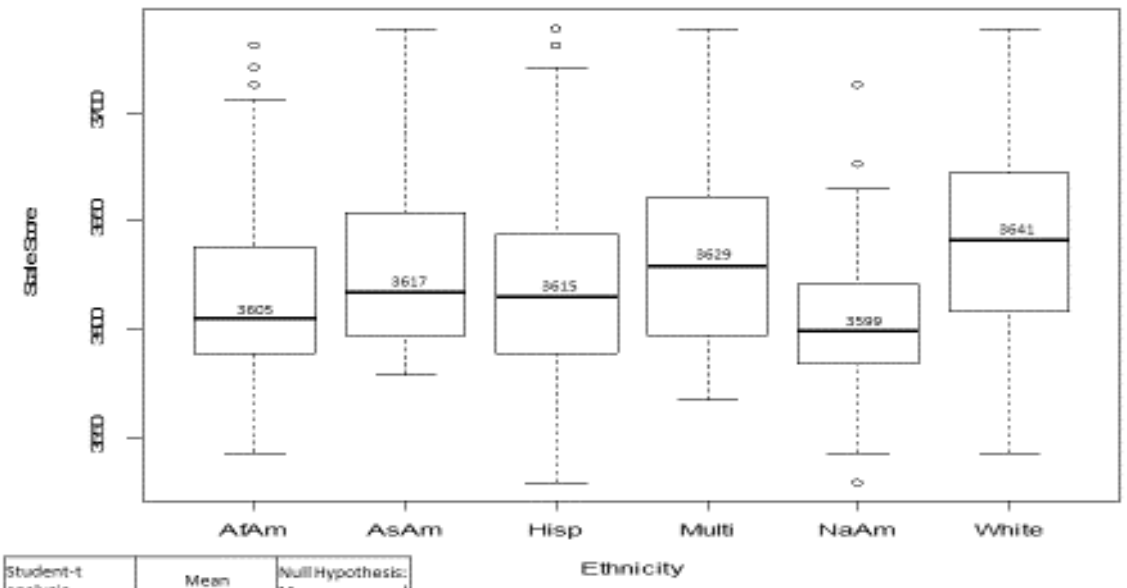
AzMERIT Math Results - 6th Grade Cohort



Student-t analysis	Mean	Null Hypothesis: Means are equal
AfAm to White	3589.5 to 3622.1	Reject
AsAm to White	3600.7 to 3622.1	Reject
Hisp to White	3596.3 to 3622.1	Reject
Multi to White	3614.9 to 3622.1	Can't Reject
NaAm to White	3580.1 to 3622.1	Reject

12

AzMERIT Math Results - 7th Grade Cohort



Student-t analysis	Mean	Null Hypothesis: Means are equal
AfAm to White	3615.1 to 3643.2	Reject
AsAm to White	3629.1 to 3643.2	Cannot Reject
Hisp to White	3618.3 to 3643.2	Reject
Multi to White	3633.7 to 3643.2	Can't Reject
NaAm to White	3602.7 to 3643.2	Reject

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