# School District Analysis

## Overview

This analysis reviews standardized testing data to inform school district decisions.  Math and reading scores for ninth graders from Thomas High School were replaced due to suspected fraud.  Insights regarding the impact of these changes are shown in this report.

## Results

- Average math score in the district summary decreased by one-tenth of a percent (from 79.0 to 78.9)

  *Original*

  | | Total Schools | Total Students | Total Budget | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
  |---|---|---|---|---|---|---|---|---|
  | 0 | 15 | 39,170 | $24,649,428.00 | 79.0 | 81.9 | 75 | 86 | 65 |

  *Revised*

  | | Total Schools | Total Students | Total Budget | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
  |---|---|---|---|---|---|---|---|---|
  | 0 | 15 | 39,170 | $24,649,428.00 | 78.9 | 81.9 | 75 | 86 | 65 |

- The school summary reflects slightly lower average math scores, slightly higher average reading scores.  Passing rates for math, reading and overall dropped significantly.

  *Original*

  | | School Type | Total Students | Total School Budget | Per Student Budget | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
  |---|---|---|---|---|---|---|---|---|---|
  | Thomas High School | Charter | 1635 | 1043130 | 638.0 | 83.418349 | 83.848930 | 93.272171 | 97.308869 | 90.948012 |

  *Revised*

  | | School Type | Total Students | Total School Budget | Per Student Budget | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
  |---|---|---|---|---|---|---|---|---|---|
  | Thomas High School | Charter | 1635 | $1,043,130.00 | $638.00 | 83.350937 | 83.896082 | 66.911315 | 69.663609 | 65.076453 |

- Replacing the ninth graders' scores for Thomas High School changed its ranking from second best performing schools based on overall passing percentage, to the third lowest performing school.

*Original*

```
# Sort and show top five schools.
top_schools = per_school_summary_df.sort_values(["% Overall Passing"], ascending=False)

top_schools.head()
```

| | School Type | Total Students | Total School Budget | Per Student Budget | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
|---|---|---|---|---|---|---|---|---|---|
| Cabrera High School | Charter | 1858 | $1,081,356.00 | $582.00 | 83.061895 | 83.975780 | 94.133477 | 97.039828 | 91.334769 |
| Thomas High School | Charter | 1635 | $1,043,130.00 | $638.00 | 83.418349 | 83.848930 | 93.272171 | 97.308869 | 90.948012 |
| Griffin High School | Charter | 1468 | $917,500.00 | $625.00 | 83.351499 | 83.816757 | 93.392371 | 97.138965 | 90.599455 |
| Wilson High School | Charter | 2283 | $1,319,574.00 | $578.00 | 83.274201 | 83.989488 | 93.867718 | 96.539641 | 90.582567 |
| Pena High School | Charter | 962 | $585,858.00 | $609.00 | 83.839917 | 84.044699 | 94.594595 | 95.945946 | 90.540541 |

*Revised*

```
# per_school_summary_df
per_school_summary_df.tail()
```

| | School Type | Total Students | Total School Budget | Per Student Budget | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
|---|---|---|---|---|---|---|---|---|---|
| Rodriguez High School | District | 3999 | $2,547,363.00 | $637.00 | 76.842711 | 80.744686 | 66.366592 | 80.220055 | 52.988247 |
| Shelton High School | Charter | 1761 | $1,056,600.00 | $600.00 | 83.359455 | 83.725724 | 93.867121 | 95.854628 | 89.892107 |
| Thomas High School | Charter | 1635 | $1,043,130.00 | $638.00 | 83.350937 | 83.896082 | 93.185690 | 97.018739 | 90.630324 |
| Wilson High School | Charter | 2283 | $1,319,574.00 | $578.00 | 83.274201 | 83.989488 | 93.867718 | 96.539641 | 90.582567 |
| Wright High School | Charter | 1800 | $1,049,400.00 | $583.00 | 83.682222 | 83.955000 | 93.333333 | 96.611111 | 90.333333 |

- Replacing the ninth graders' reading and math scores changes the values for that grade to "NaN". The scores for 10th-12th graders were not affected.

*Original*

```
# Display the DataFrame.
math_scores_by_grade.tail()
```

| | 9th | 10th | 11th | 12th |
|---|---|---|---|---|
| Rodriguez High School | 76.9 | 76.6 | 76.4 | 77.7 |
| Shelton High School | 83.4 | 82.9 | 83.4 | 83.8 |
| Thomas High School | 83.6 | 83.1 | 83.5 | 83.5 |
| Wilson High School | 83.1 | 83.7 | 83.2 | 83.0 |
| Wright High School | 83.3 | 84.0 | 83.8 | 83.6 |

*Revised*

```
# Display the data frame
math_scores_by_grade.tail()
```

| | 9th | 10th | 11th | 12th |
|---|---|---|---|---|
| Rodriguez High School | 76.9 | 76.6 | 76.4 | 77.7 |
| Shelton High School | 83.4 | 82.9 | 83.4 | 83.8 |
| Thomas High School | nan | 83.1 | 83.5 | 83.5 |
| Wilson High School | 83.1 | 83.7 | 83.2 | 83.0 |
| Wright High School | 83.3 | 84.0 | 83.8 | 83.6 |

- Replacing the ninth graders' scores did not affect the scores by school spending.

*Original*

| Spending Ranges (Per Student) | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
|---|---|---|---|---|---|
| <$584 | 83.5 | 83.9 | 93 | 97 | 90 |
| $585-629 | 81.9 | 83.2 | 87 | 93 | 81 |
| $630-644 | 78.5 | 81.6 | 73 | 84 | 63 |
| $645-675 | 77.0 | 81.0 | 66 | 81 | 54 |

*Revised*

| Spending Ranges (Per Student) | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
|---|---|---|---|---|---|
| <$584 | 83.5 | 83.9 | 93 | 97 | 90 |
| $585-629 | 81.9 | 83.2 | 87 | 93 | 81 |
| $630-644 | 78.5 | 81.6 | 73 | 84 | 63 |
| $645-675 | 77.0 | 81.0 | 66 | 81 | 54 |

## o Scores by school size

- Replacing the ninth graders' scores did not affect the scores by school size.

*Original*

| School Size | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
|---|---|---|---|---|---|
| Small (<1000) | 83.8 | 83.9 | 94 | 96 | 90 |
| Medium (1000-2000) | 83.4 | 83.9 | 94 | 97 | 91 |
| Large (2000-5000) | 77.7 | 81.3 | 70 | 83 | 58 |

*Revised*

| School Size | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
|---|---|---|---|---|---|
| Small (<1000) | 83.8 | 83.9 | 94 | 96 | 90 |
| Medium (1000-2000) | 83.4 | 83.9 | 94 | 97 | 91 |
| Large (2000-5000) | 77.7 | 81.3 | 70 | 83 | 58 |

- Replacing the ninth graders' scores did not affect the scores by school type.

*Original*

| School Type | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
|---|---|---|---|---|---|
| Charter | 83.5 | 83.9 | 94 | 97 | 90 |
| District | 77.0 | 81.0 | 67 | 81 | 54 |

*Revised*

| School Type | Average Math Score | Average Reading Score | % Passing Math | % Passing Reading | % Overall Passing |
|---|---|---|---|---|---|
| Charter | 83.5 | 83.9 | 94 | 97 | 90 |
| District | 77.0 | 81.0 | 67 | 81 | 54 |

**Summary**

To summarize, the audit revealed:
1. Lower average math scores for the district
2. Thomas High School showed lower average score for both math and reading as well significant reductions in passing rate for each subject and overall.
3. Replacing the scores for the Thomas High School ninth-graders had no impact on the scores for 10th-11th graders.
4. There was no change the scores by school spending, size or type.