As Chief Data Scientist for the city’s school district, we have completed an analysis into the performance of public high schools as measured by student’s math and reading scores on standardized tests.

**Objective:**

Analyze district-wide standardized test results to identify trends in school performance and support decisions on school budget and priorities to drive improved student results.

**Data Used:**

* School specific data including School Name, School Type (Charter vs. District), School Size and School Budget for the 15 district high schools.
* Student data including Student ID, Student Name, Gender, Grade, School attended, and Reading and Math scores for the 39,170 students enrolled in the district high schools.

**Analysis Approach:**

* Determine district performance metrics including average math and reading scores, percent of students passing math and reading, and overall passing (pass both math and reading)
* Drill down analysis to measure individual High School performance calculating all District metrics and adding financial metrics (school budget and per student budget)
* Identify Top and Bottom performing schools
* Drill down school performance to the student grade level and measure math and reading scores
* Analyze performance differences based on school spending, school size, and school type (Charter vs District)

**Summary of Findings:**

District Summary

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Total Schools** | **Total Students** | **Total Budget** | **Avg Math Score** | **Avg Reading Score** | **% Passing Math** | **% Passing Reading** | **% Overall Passing** |
| 15 | 39,170 | $24.6M | 79.0 | 81.9 | 75.0 | 85.8 | 65.2 |

* For the FY, the city spent $24.65M dollars with only 65.2% of students passing both math and reading tests (greater than 70 score on both).
* Reading results were significantly better with an average score of 81.9 and 85.8% of students passing as compared to an average score of 79.0 and 75.0% of students passing math.

High School Performance

The top performing schools all achieved a better than 90% of students passing both Reading and Math tests where:

* Cabrera High School: 91.3% passing
* Thomas High School: 90.9% passing
* Griffin High School: 90.6% passing
* Wilson High School: 90.6% passing
* Pena High School: 90.5% passing

The bottom performer schools all achieved around 53% of students passing where:

* Rodriguez High School: 53.0% passing
* Figueroa High School: 53.2% passing
* Huang High School: 53.5% passing
* Hernandez High School: 53.5% passing
* Johnson High School: 53.5% passing

Initial Conclusions and Recommendations:

There is a 3830bp gap between top and bottom performing schools (91.3% vs 53.0%). Based on our analysis, some initial conclusions and recommendations are:

* All 5 of the bottom performing High Schools have large student populations (more than 2000) with a per student budget of at least $630/students.

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| **School Name** | **Total Students** | **Per Student Budget** | **% Overall Passing** |
| **Rodriguez High School** | 3,999 | $637.00 | 53.0% |
| **Figueroa High School** | 2,949 | $639.00 | 53.2% |
| **Huang High School** | 2,917 | $655.00 | 53.5% |
| **Hernandez High School** | 4,635 | $652.00 | 53.5% |
| **Johnson High School** | 4,761 | $650.00 | 53.5% |

* In general, large schools with large budgets significantly underperform their counterparts with a lower overall percent of their students passing both Math and Reading.

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| **Spending Ranges (Per Student)** | **Average Math Score** | **Average Reading Score** | **% Passing Math** | **% Passing Reading** | **% Overall Passing** |
| **<$585** | 83.5 | 83.9 | 93.5% | 96.6% | 90.4% |
| **$585-630** | 81.9 | 83.2 | 87.1% | 92.7% | 81.4% |
| **$630-645** | 78.5 | 81.6 | 73.5% | 84.4% | 62.9% |
| **$645-680** | 77.0 | 81.0 | 66.2% | 81.1% | 53.5% |

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| --- | --- | --- | --- | --- | --- |
| **School Size** | **Average Math Score** | **Average Reading Score** | **% Passing Math** | **% Passing Reading** | **% Overall Passing** |
| **Small (<1000)** | 83.8 | 83.9 | 93.6% | 96.1% | 89.9% |
| **Medium (1000-2000)** | 83.4 | 83.9 | 93.6% | 96.8% | 90.6% |
| **Large (2000-5000)** | 77.7 | 81.3 | 70.0% | 82.8% | 58.3% |

* Charter schools outperform District schools by over 3600bp (90.4% vs. 53.7%)

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| --- | --- | --- | --- | --- | --- |
| **School Type** | **Average Math Score** | **Average Reading Score** | **% Passing Math** | **% Passing Reading** | **% Overall Passing** |
| **Charter** | 83.5 | 83.9 | 93.6% | 96.6% | 90.4% |
| **District** | 77.0 | 81.0 | 66.5% | 80.8% | 53.7% |

Given this behavior, I recommend directing more resources at extending Charter schools and further drilling into the differences between Charter and District schools to close performance gaps and ensure our students can pass both Math and Reading.