

## Analysis Report

# PyCity Schools District

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## Introduction

PyCity Schools District is a fictitious school district. This exercise is to illustrate how a new Chief Data Scientist for PyCity city's school district can help the school board and city mayor to make strategic decisions regarding future budgets and priorities for their schools.

The data is composed of 2 external files (schools and students' data). The task is to analyze the data based on math and reading student's scores.

## Summary

PyCity School charter schools consistently outperformed districts schools across math and reading metrics. Also, smaller and medium size schools demonstrate better academic performance, with higher average scores and passing rates.

## Findings

### District Summary

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	78.985371	81.87784	74.980853	85.805463	65.172326

The analysis is of 39,170 students that are attending 15 schools in the district. The school district has a total budget of \$24.6MM. The school district has District and Charter schools. Budget allocation has been distributed based on the number of students, giving close to the same budget per student across all schools.

This analysis focuses on only the total students, and 2 class scores, Math and Reading. Other factors like the number of students per teacher ratio are not taken into consideration, as well as not considering arts, sports or other subjects or activities.

## Highest and lowest Performing Schools by % Overall Passing

### Highest-Performing Schools (by % Overall Passing)

	School Type	Total Students	Total School Budget	Per Student Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
school_name									
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

The highest overall passing performing schools are all charter schools. It is also worth noting that low Total Students is significant to the overall performance.

### Bottom Performing Schools (by % Overall Passing)

	School Type	Total Students	Total School Budget	Per Student Budget	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
school_name									
Rodriguez High School	District	3999	\$2,547,363.00	\$637.00	76.842711	80.744686	66.366592	80.220055	52.988247
Figueroa High School	District	2949	\$1,884,411.00	\$639.00	76.711767	81.158020	65.988471	80.739234	53.204476
Huang High School	District	2917	\$1,910,635.00	\$655.00	76.629414	81.182722	65.683922	81.316421	53.513884
Hernandez High School	District	4635	\$3,022,020.00	\$652.00	77.289752	80.934412	66.752967	80.862999	53.527508
Johnson High School	District	4761	\$3,094,650.00	\$650.00	77.072464	80.966394	66.057551	81.222432	53.539172

The bottom overall passing performance schools are all district schools. Also, the bottom overall passing performance schools have some of the highest total students in the district.

The percentage of students passing math is a lot higher in the high performing schools than in the low performing schools.

## Scores by Grade

### Math Scores

	9th	10th	11th	12th
Bailey High School	77.083676	76.996772	77.515588	76.492218
Cabrera High School	83.094697	83.154506	82.765560	83.277487
Figueroa High School	76.403037	76.539974	76.884344	77.151369
Ford High School	77.361345	77.672316	76.918058	76.179963
Griffin High School	82.044010	84.229064	83.842105	83.356164
Hernandez High School	77.438495	77.337408	77.136029	77.186567
Holden High School	83.787402	83.429825	85.000000	82.855422
Huang High School	77.027251	75.908735	76.446602	77.225641
Johnson High School	77.187857	76.691117	77.491653	76.863248
Pena High School	83.625455	83.372000	84.328125	84.121547
Rodriguez High School	76.859966	76.612500	76.395626	77.690748
Shelton High School	83.420755	82.917411	83.383495	83.778976
Thomas High School	83.590022	83.087886	83.498795	83.497041
Wilson High School	83.085578	83.724422	83.195326	83.035794
Wright High School	83.264706	84.010288	83.836782	83.644986

The difference between highest and lowest math scores per grade is quite significant.

Grade	Highest	Lowest	Difference
9	83.79	76.86	6.93
10	84.23	75.91	8.32
11	85.00	76.40	8.60
12	84.12	76.18	7.94

The highest math score comes from 11<sup>th</sup> grade at Holden High School which is a Charter school with a total of 427 students. The lowest score comes from 10<sup>th</sup> grade at Huang High School which is a District school with a total of 2917 students.

Holden High School	Charter	427	\$248,087.00	\$581.00	83.803279	83.814988	92.505855	96.252927	89.227166
Huang High School	District	2917	\$1,910,635.00	\$655.00	76.629414	81.182722	65.683922	81.316421	53.513884

## Reading Scores

	9th	10th	11th	12th
<b>Bailey High School</b>	81.303155	80.907183	80.945643	80.912451
<b>Cabrera High School</b>	83.676136	84.253219	83.788382	84.287958
<b>Figueroa High School</b>	81.198598	81.408912	80.640339	81.384863
<b>Ford High School</b>	80.632653	81.262712	80.403642	80.662338
<b>Griffin High School</b>	83.369193	83.706897	84.288089	84.013699
<b>Hernandez High School</b>	80.866860	80.660147	81.396140	80.857143
<b>Holden High School</b>	83.677165	83.324561	83.815534	84.698795
<b>Huang High School</b>	81.290284	81.512386	81.417476	80.305983
<b>Johnson High School</b>	81.260714	80.773431	80.616027	81.227564
<b>Pena High School</b>	83.807273	83.612000	84.335938	84.591160
<b>Rodriguez High School</b>	80.993127	80.629808	80.864811	80.376426
<b>Shelton High School</b>	84.122642	83.441964	84.373786	82.781671
<b>Thomas High School</b>	83.728850	84.254157	83.585542	83.831361
<b>Wilson High School</b>	83.939778	84.021452	83.764608	84.317673
<b>Wright High School</b>	83.833333	83.812757	84.156322	84.073171

There is not much difference between highest and lowest reading scores per grade.

Grade	Highest	Lowest	Difference
9	84.12	80.63	3.49
10	84.25	80.63	3.62
11	84.37	80.40	3.97
12	84.70	80.31	4.39

The highest math score comes from 12<sup>th</sup> grade at Holden High School which is a Charter school with a total of 427 students. The lowest score comes from 12<sup>th</sup> grade at Huang High School which is a District school with a total of 2917 students.

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## Scores by School Spending

Looking at the school spending per student, it shows that budgeting more per student does not impact the percentage of overall passing. However, the impact may not be due to budget, but per total students per school.

	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
Spending Ranges (Per Student)					
<\$585	83.455399	83.933814	93.460096	96.610877	90.369459
\$585-630	81.899826	83.155286	87.133538	92.718205	81.418596
\$630-645	78.518855	81.624473	73.484209	84.391793	62.857656
\$645-680	76.997210	81.027843	66.164813	81.133951	53.526855

## Scores by School Size

School size is a significant factor in students passing their grades. Small and Medium size schools have an overall passing of 90%, math 93% and reading 96%. In contrast, large size schools have an overall passing of 58%, math 70% and reading 83%.

	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
School Size					
Small (<1000)	83.821598	83.929843	93.550225	96.099437	89.883853
Medium (1000-2000)	83.374684	83.864438	93.599695	96.790680	90.621535
Large (2000-5000)	77.746417	81.344493	69.963361	82.766634	58.286003

## Score by School Type

Charter schools have outperformed district schools, especially on the percentage of students passing math.

	Average Math Score	Average Reading Score	% Passing Math	% Passing Reading	% Overall Passing
School Type					
Charter	83.473852	83.896421	93.620830	96.586489	90.432244
District	76.956733	80.966636	66.548453	80.799062	53.672208

## Conclusion

Based on the data analysis, 2 conclusions can be drawn:

1. Charter schools consistently outperformed districts schools across math and reading metrics. This suggests that the educational strategies and environment in charter schools might be more conducive to higher student achievement compared to district schools.
2. Smaller and medium size schools demonstrate better academic performance, with higher average scores and passing rates. This could be caused by being able to provide more personalized attention and tailored educational approaches, leading to better student outcomes.