

District of Columbia Office of the State Superintendent of Education

2018 STAR Framework Brief: Appendices















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Appendix A

Distribution of STAR Ratings by School Framework

Similar to the statewide distribution, the Elementary, Middle and High School frameworks show relatively normal distributions in the STAR scores earned by schools. Examining the distribution in STAR scores across the city and by framework using the Shapiro-Wilk test for normality finds that the distribution in framework scores for the Elementary, Middle, and High School frameworks is statistically normal.



Figure A.1: Density Plot of School Framework Scores

Tests of normality using the Shapiro-Wilk test indicate that the null hypothesis that the data are normally distributed could not be rejected (p>.05) supporting the assumption that the STAR ratings within the Elementary, Middle and High School frameworks are normally distributed.

Table A.1: Shapiro-Wilk Test

Framework	W-value	p-value	N-size
Elementary School	0.986	0.184	134
Middle School	0.984	0.482	72
High School	0.966	0.342	35

The two-sample Kolomogorov-Smirov test is a nonparametric test that compares the distributions of two data sets. This test was used to examine whether the Elementary, Middle and High School frameworks shared similar distributions. Findings indicated that the null hypothesis could not be

rejected (p>.05). The conclusion is that there is no significant difference between the distributions of STAR ratings within each framework.

Table A.2: Kolmogorov-Smirnov Test

Distribution 1	Distribution 2	p-value
Elementary	Middle	0.990
Elementary	High	0.766
Middle	High	0.869

Elementary School Framework Distributions

Figure A.2 shows the distribution of framework ratings across all public schools with an Elementary School framework (with and without pre-kindergarten). Similar to the statewide distribution, the Elementary School framework shows a normal distribution across framework ratings, with a three-star framework rating the most common rating and an equal number of schools receiving two- and four-star framework ratings.



Figure A.2: Elementary School Framework STAR Rating Distribution

Figure A.3 shows the distribution of framework scores in the Elementary School framework. Each bar represents the Elementary framework score for an individual school. The color of each bar corresponds to each framework rating, one through five, with the dotted lines representing the framework score cut points for each framework rating.





Middle School Framework Distributions

Similar to the figures presented for the Elementary School framework, Figure A.4 and Figure A.5 show the distribution of framework ratings and framework scores for all schools with a Middle School framework, respectively. While a slightly higher proportion of schools in the Middle School framework earned a one-star framework rating (11% versus 6%) and a slightly lower proportion earned a four-star rating (19% versus 24%) compared to the Elementary School framework, the proportion of STAR ratings across schools was similar for elementary and middle schools.



Figure A.4: Middle School Framework STAR Rating Distribution





High School Framework Distributions

Figure A.6 and Figure A.7 show the distribution of framework ratings and framework scores for the High School framework, respectively. Among schools with a High School framework, a larger proportion earned both one-star and five-star ratings, with a lower proportion earning four-star ratings.



Figure A.6: High School Framework STAR Rating Distribution





Alternative School Framework Distributions

Figures A.8 and A.9 show the distribution of STAR ratings and framework scores for the Alternative School framework. Most alternative schools earned a two-star rating, with one school earning a three-star rating. All seven schools with an Alternative School framework earned a score between 20 and 60.



Figure A.8: Alternative School Framework STAR Rating Distribution





Distribution of STAR Ratings by Sector

The distribution of STAR scores for each public school by sector is displayed in A.10. DC Public Schools (DCPS) and public charter schools show a range in STAR scores with charter schools having a higher median score (M=50.93) than DCPS schools (M=45.37).¹

DCPS has a larger percentage of schools at the one- and five-star ratings than charter schools, but both sectors have fewer schools at the one- and five-star ratings than the two-, three-, or four-star ratings. This is further emphasized in Figure A.11 when the distributions of both charter and DCPS are placed on the same axis.



Figure A.10: School STAR Ratings Distribution by Sector

¹ Median values are truncated at two decimals.



Figure A.11: School STAR Ratings Distribution by Sector on same Axis

Figure A.12 shows the proportion of schools receiving each STAR rating, by sector. Each segment represents the proportion of schools receiving each STAR rating and the number inside each segment is the total number of schools with the corresponding STAR rating.

Figure A.12: School STAR Ratings Proportion by Sector



While a similar proportion of charter and DCPS schools earned either a four- or five-star rating, DCPS schools earned a higher proportion of 5-star ratings. Among the remaining one-, two- and three-star

ratings, DCPS schools also earned a higher proportion of one-star ratings while charter schools earned a higher proportion of three-star ratings. Both sectors had a similar proportion of schools with a two-star rating. Table A.3 below shows the percentage of schools in each sector that earned each STAR Rating.

Table A.3: Percent of STAR Rated Schools by Sector

STAR Rating	Charter (%)	DCPS (%)
1	5.26	12.96
2	27.37	26.85
3	40.00	32.41
4	23.16	15.74
5	4.21	12.04

Distribution of STAR Ratings by Ward

We also examined the distribution of scores across wards. Figures A.13 and A.14 show STAR rating proportions by ward, citywide and by sector. Each segment represents the proportion of schools receiving each STAR rating by ward; the number inside each segment is the total number of schools with the corresponding STAR rating.

Figure A.13 displays the citywide proportion of schools receiving each STAR rating, by ward. This analysis shows that each ward has four-star schools, signifying that there are high performing schools throughout DC. At the same time, there are differences in STAR rating distributions across wards.

Figure A.13 shows that schools in Wards 1 and 4 have a lower proportion of two-star ratings and a higher proportion of three-star ratings compared to the citywide distribution. Ward 4 schools earned significantly more four-star ratings and Ward 1 schools earned more five-star ratings in comparison with citywide distributions. Schools in Ward 8 earned a high proportion of one-star ratings compared to other wards and none of the schools in Ward 7 or Ward 8 earned a five-star rating. Schools in Ward 5 and 6 showed a similar distribution in STAR ratings compared to the city overall, with slightly higher proportions of schools earning three-star ratings and slightly lower proportions earning five-star ratings. Because STAR Framework metric targets are set for three consecutive years, it is our goal that all schools will improve their STAR scores from year to year.



Figure A.13: School STAR Ratings Proportion by Ward







STAR Rating	Ward 1 n=14	Ward 2 n=9	Ward 3 n=10	Ward 4 n=34	Ward 5 n=40	Ward 6 n=30	Ward 7 n=31	Ward 8 n=35
1	7.14%	0.00%	0.00%	8.82%	5.00%	3.33%	9.68%	25.71%
2	14.29%	0.00%	0.00%	11.76%	27.50%	26.67%	51.61%	40.00%
3	42.86%	33.33%	0.00%	47.06%	42.50%	46.67%	25.81%	25.71%
4	21.43%	22.22%	50.00%	29.41%	17.50%	16.67%	12.90%	8.57%
5	14.29%	44.44%	50.00%	2.94%	7.50%	6.67%	0.00%	0.00%

Table A.4: Percent of STAR Rated Schools by Ward

Appendix B

Correlation Matrices between Metric Scores

Pearson correlation coefficients were used to examine the strength of the linear relationship between STAR metrics. Figure B.3 show the correlation matrices for all STAR Framework metrics for the Elementary, Middle and High School Frameworks, respectively. Darker colors represent higher correlations.

Correlations matrices offer an initial glance at the relationship between two variables. In this section, the correlation matrices indicate the relationship between two STAR metrics. As the number (coefficient) between two metrics approaches 1, the stronger the positive relationship is between those metrics. As the coefficient between two metrics approach -1, the stronger the negative relationship is between those metrics. If the coefficient between two metrics is 0, there is no relationship between those metrics. Correlation coefficients are an initial indicator of a positive or negative relationship, but should be viewed with caution as they do not assert any significance to the relationship between two metrics. Two metrics can be very highly correlated, but still measure something different. For example, examination of the correlation coefficients reveals strong correlations between ELA and math performance metrics within the achievement domain, though they measure different constructs.

Correlations between Metrics

Looking across STAR domains, weak to moderate relationships between the academic achievement and growth metrics are observed. Only a moderate correlation is observed between academic growth metrics, Median Growth Percentile and Growth to Proficiency. At the same time, the Growth to Proficiency and Median Growth Percentile metrics for the same subject (ELA or Math) are highly correlated.

With respect to attendance metrics, 90% Attendance is highly correlated with In-Seat Attendance across all three frameworks. This finding suggests that schools with high rates of In-Seat Attendance also tend to perform well on the 90% Attendance metric. Attendance Growth is weakly correlated with other measures of attendance in the Elementary School framework, while it is highly correlated with other measures of attendance in the Middle and High School frameworks.

Figure B.1 Elementary School Metric Correlation Matrix

Re-enrollment -	0.53	0.52	0.51	0.51	0.24	0.03	0.39	0.19	-0.19	0	0.22	0.25	0.21	0.5	0.6	0.56	1
90% Attendance -	0.67	0.56	0.64	0.55	0.26	0.18	0.49	0.3	-0.13	0.2	0.23	0.25	0.13	0.97	0.83	1	0.56
In-Seat Attendance - Pre-K -	0.67	0.64	0.64	0.61	0.24	0.11	0.45	0.26	-0.15	0.1	0.15	0.2	0.1	0.84	1	0.83	0.6
In-Seat Attendance -	0.66	0.56	0.64	0.54	0.26	0.16	0.5	0.28	-0.11	0.2	0.24	0.26	0.13	1	0.84	0.97	0.5
CLASS - Instructional Support -	0.07	0.11	0.04	0.04	0.07	0.14	0.06	0.18	-0.14	-0.05	0.67	0.68	1	0.13	0.1	0.13	0.21
CLASS - Emotional Support -	0.18	0.16	0.12	0.14	0.13	0.02	0.1	0.08	-0.18	-0.04	0.84	1	0.68	0.26	0.2	0.25	0.25
CLASS - Classroom Organization -	0.1	0.14	0.08	0.12	0.15	0.14	0.11	0.14	-0.23	-0.07	1	0.84	0.67	0.24	0.15	0.23	0.22
Attendance Growth -	0.01	-0.1	-0.02	-0.16	0.04	0.09	0.09	0.04	0.07	1	-0.07	-0.04	-0.05	0.2	0.1	0.2	0
ACCESS Growth -	0.02	-0.03	0.05	-0.06	0.36	0.16	0.28	0.06	1	0.07	-0.23	-0.18	-0.14	-0.11	-0.15	-0.13	-0.19
Median Growth Percentile - Math -	0.32	0.41	0.3	0.37	0.39	0.92	0.5	1	0.06	0.04	0.14	0.08	0.18	0.28	0.26	0.3	0.19
Median Growth Percentile - ELA -	0.7	0.58	0.69	0.59	0.86	0.41	1	0.5	0.28	0.09	0.11	0.1	0.06	0.5	0.45	0.49	0.39
Growth to Proficiency - Math -	0.12	0.19	0.13	0.17	0.37	1	0.41	0.92	0.16	0.09	0.14	0.02	0.14	0.16	0.11	0.18	0.03
Growth to Proficiency - ELA -	0.46	0.38	0.44	0.39	1	0.37	0.86	0.39	0.36	0.04	0.15	0.13	0.07	0.26	0.24	0.26	0.24
PARCC Math 4+ -	0.88	0.95	0.89	1	0.39	0.17	0.59	0.37	-0.06	-0.16	0.12	0.14	0.04	0.54	0.61	0.55	0.51
PARCC ELA 4+ -	0.95	0.83	1	0.89	0.44	0.13	0.69	0.3	0.05	-0.02	0.08	0.12	0.04	0.64	0.64	0.64	0.51
PARCC Math 3+ -	0.87	1	0.83	0.95	0.38	0.19	0.58	0.41	-0.03	-0.1	0.14	0.16	0.11	0.56	0.64	0.56	0.52
PARRC ELA 3+ -	1	0.87	0.95	0.88	0.46	0.12	0.7	0.32	0.02	0.01	0.1	0.18	0.07	0.66	0.67	0.67	0.53
	PARRC ELA 3+	PARCC Math 3+	PARCC ELA 4+	PARCC Math 4+	Growth to Proficiency - ELA	Growth to Proficiency - Math	Median Growth Percentile - ELA ⁻	Median Growth Percentile - Math ⁻	ACCESS Growth	Attendance Growth	CLASS - Classroom Organization	CLASS - Emotional Support	CLASS - Instructional Support	In-Seat Attendance	In-Seat Attendance - Pre-K	90% Attendance	- Re-enrollment

Figure B.2 Middle School Metric Correlation Matrix

100													
Re-enrollment -	0.52	0.52	0.46	0.44	0.24	0.2	0.2	0.22	0.11	0.11	0.38	0.44	1
90% Attendance -	0.58	0.64	0.53	0.52	0.43	0.44	0.41	0.4	0.38	0.72	0.98	1	0.44
In-Seat Attendance -	0.55	0.61	0.49	0.47	0.39	0.43	0.38	0.38	0.4	0.76	1	0.98	0.38
Attendance Growth -	0.24	0.32	0.19	0.19	0.26	0.32	0.31	0.32	0.37	1	0.76	0.72	0.11
ACCESS Growth -	0.24	0.21	0.19	0.18	0.02	0.24	-0.1	0.26	1	0.37	0.4	0.38	0.11
Median Growth Percentile - Math -	0.5	0.57	0.39	0.48	0.51	0.92	0.47	1	0.26	0.32	0.38	0.4	0.22
Median Growth Percentile - ELA -	0.64	0.41	0.5	0.35	0.95	0.43	1	0.47	-0.1	0.31	0.38	0.41	0.2
Growth to Proficiency - Math -	0.55	0.66	0.5	0.6	0.52	1	0.43	0.92	0.24	0.32	0.43	0.44	0.2
Growth to Proficiency - ELA -	0.75	0.54	0.63	0.49	1	0.52	0.95	0.51	0.02	0.26	0.39	0.43	0.24
PARCC Math 4+ -	0.79	0.94	0.88	1	0.49	0.6	0.35	0.48	0.18	0.19	0.47	0.52	0.44
PARCC ELA 4+ -	0.92	0.86	1	0.88	0.63	0.5	0.5	0.39	0.19	0.19	0.49	0.53	0.46
PARCC Math 3+ -	0.86	1	0.86	0.94	0.54	0.66	0.41	0.57	0.21	0.32	0.61	0.64	0.52
PARRC ELA 3+ -	1	0.86	0.92	0.79	0.75	0.55	0.64	0.5	0.24	0.24	0.55	0.58	0.52
	PARRC ELA 3+	PARCC Math 3+	PARCC ELA 4+	PARCC Math 4+	Growth to Proficiency - ELA	Growth to Proficiency - Math	Median Growth Percentile - ELA	Median Growth Percentile - Math	ACCESS Growth	Attendance Growth	In-Seat Attendance	90% Attendance	Re-enrollment

Re-enrollment -	0.66	0.78	0.74	0.69	0.68	0.62	0.26	0.78	0.5	0.73	0.79	0.5	0.69	0.67	1
90% Attendance -	0.53	0.74	0.64	0.61	0.57	0.53	-0.1	0.6	0.2	0.54	0.64	0.83	0.95	1	0.67
In-Seat Attendance -	0.46	0.72	0.62	0.57	0.51	0.45	-0.07	0.64	0.2	0.48	0.7	0.84	1	0.95	0.69
Attendance Growth -	0.34	0.53	0.43	0.41	0.37	0.34	-0.02	0.47	0.14	0.4	0.5	1	0.84	0.83	0.5
Extended Years Graduation -	0.51	0.74	0.68	0.65	0.58	0.48	0.21	0.97	0.49	0.46	1	0.5	0.7	0.64	0.79
APIB - Performance -	0.88	0.66	0.77	0.82	0.85	0.89	0.3	0.48	0.67	1	0.46	0.4	0.48	0.54	0.73
APIB - Participation -	0.63	0.56	0.57	0.62	0.64	0.58	0.44	0.52	1	0.67	0.49	0.14	0.2	0.2	0.5
4 Year Gradutation -	0.54	0.74	0.71	0.64	0.61	0.5	0.2	1	0.52	0.48	0.97	0.47	0.64	0.6	0.78
ACCESS Growth -	-0.14	-0.02	0.05	0.11	0	0.07	1	0.2	0.44	0.3	0.21	-0.02	-0.07	-0.1	0.26
PARCC Math 4+ -	0.96	0.71	0.84	0.91	0.92	1.	0.07	0.5	0.58	0.89	0.48	0.34	0.45	0.53	0.62
PARCC ELA 4+ -	0.94	0.82	0.95	0.92	1	0.92	0	0.61	0.64	0.85	0.58	0.37	0.51	0.57	0.68
PARCC Math 3+ -	0.91	0.82	0.91	1	0.92	0.91	0.11	0.64	0.62	0.82	0.65	0.41	0.57	0.61	0.69
PARRC ELA 3+ -	0.86	0.88	1	0.91	0.95	0.84	0.05	0.71	0.57	0.77	0.68	0.43	0.62	0.64	0.74
SAT - 50th Percentile -	0.77	1	0.88	0.82	0.82	0.71	-0.02	0.74	0.56	0.66	0.74	0.53	0.72	0.74	0.78
SAT - College Ready -	1	0.77	0.86	0.91	0.94	0.96	-0.14	0.54	0.63	0.88	0.51	0.34	0.46	0.53	0.66
	SAT - College Ready	SAT - 50th Percentile	PARRC ELA 3+	PARCC Math 3+	PARCC ELA 4+	PARCC Math 4+	ACCESS Growth	4 Year Gradutation	APIB - Participation	APIB - Performance	Extended Years Graduation	Attendance Growth	In-Seat Attendance	90% Attendance	Re-enrollment

Figure B.3 High School Metric Correlation Matrix

Regression Analyses Exploring Student Groups and STAR Ratings

Relationships between Student Groups, STAR Metrics, and STAR Scores

The following series of regression analyses examine the relationship between schools' student composition (the percentage of students in each student group) and schools' STAR scores. While a correlation analysis examines the association between two variables, a regression analysis allows for the examination of how one or more variables (e.g., metrics or student groups) collectively explain differences in an outcome variable (e.g., STAR score or framework score).

First, a multivariate regression model is used to explore the relationship between school composition and the STAR scores that schools earned (Table B.1). Next, a multivariate regression model was used to examine the relationship between school's student composition and framework scores (Table B.2). Then, three linear regression² models explore the relationship between metric scores and a school's percentage of students who are at-risk, students with disabilities, and English learners (Table B.5 – Table B.7). Finally, a series of step-wise multivariate regression models subsequently examine the relationship between school composition, STAR metrics, and framework scores (Table B.8 – Table B.10).

² A strong regression model typically includes a large number of observations to analyze and estimate relationships. The number of schools in the High School Framework with a STAR Score (N=35) is much smaller than the other frameworks. Because of this smaller n-size, High School Framework regression models are more likely than Elementary School Framework or Middle School Framework models to identify Type-1 and Type-2 errors. Future analysis of the STAR Framework will adopt more complex modeling to account for small population sizes.

One statistic that is a focus throughout these analyses is the adjusted- R^2 (R^2). The R^2 indicates how much variance is explained by the variables in a regression model. With this statistic we can observe how much variance is explained by student groups and metrics alone or together. There are several R^2 statistics listed in the following analysis, but caution should be used in judging R^2 statistics against one another; the R^2 can only explain how much variance is in each single model, it cannot ascertain between variables in a model which is the driving factor. Nor should the R^2 be viewed as solely causal; having a high R^2 in a model does not necessarily mean those variables cause an outcome they may only be associated with a particular outcome and can be spuriously correlated with other factors.

Student Groups and STAR Score—Multiple Regression Analysis

Multiple regression analysis was used to examine the extent to which schools' framework scores and STAR scores are related to the percentage of students who are English learners, students with disabilities, students who are at-risk, and members of each race/ethnicity group at the school (**Error! Reference source not found.1**). This analysis also included three interaction terms (English learners x students with disabilities, students with disabilities x student who are at-risk, and student who are at-risk x English learners) to assess whether the relationship between each student characteristic and STAR scores was moderated by the presence of another. For example, using interaction terms enables us to examine the extent to which the relationship between the percentage of English learners and a school's STAR score is impacted by its percentage of students with disabilities or students who are at-risk.

	(1)		(2)		(3)	
	ß	SE	ß	SE	ß	SE
English Learners	-0.159	(0.132)	-0.090	(0.241)		
Students with Disabilities	-0.517**	(0.172)	-1.138*	(0.472)	-0.547**	(0.176)
At-Risk	-0.621***	(0.0765)	-0.792***	(0.134)	-0.595***	(0.041)
American Indian/Alaskan Native	-4.742	(7.166)	-3.768	(7.590)		
Asian	-2.529	(6.417)	-2.100	(6.806)		
Black/African-American	-3.311	(6.341)	-2.695	(6.760)		
Hispanic/Latino of any race	-3.173	(6.345)	-2.566	(6.764)		
Two or more races	-3.960	(6.309)	-3.335	(6.718)		
Native Hawaiian/Other Pacific Islander	-4.345	(8.369)	-3.593	(8.619)		
White	-3.335	(6.359)	-2.761	(6.778)		
English Learner*Student with Disability			-0.000	(0.012)		
Student with Disability*At-Risk			0.0101	(0.006)		
At-Risk*English Learner			-0.001	(0.004)		
Constant	420.8	(634.1)	369.4	(676.0)	88.61***	(2.764)
Observations	203		203		203	
Adjusted R ²	0.593		0.594		0.600	

Table B.1: OLS Regression Analysis of Student Groups on School STAR Score

Linear regression of percent of population on school STAR score controlling for the percent of population of student groups with interactions in the second model.

Note: Observations is the number of schools. Standard errors in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Relationship between School Student Composition and Framework Score—Multiple Regression Analysis

To account for potential differences between school frameworks, a series of multiple regression models were run that examine the relationship between schools' student composition and STAR framework scores (Table B.2 – Table B.4). Schools' student group composition was significantly associated with differences in high school (R^2 =.817), middle school (R^2 =.571), and elementary school (R^2 =.568) STAR framework scores.

Findings that none of the race/ethnicity student groups were statistically significant across all models suggest that a school's racial/ethnic makeup is not predictive of the differences in either STAR Ratings or framework scores.

While these findings indicate a relationship between the student group populations in a school and STAR Framework scores, these statistics do not indicate that school composition predicts a school's STAR score; analysis with metric scores and student groups find that even though there is an association here between scores and student groups, it is metric performance that is driving the STAR scores (See Tables B.8-B.10 and associated discussion).

	(2	1)		(2)	(3)		
	Eleme	entary	М	iddle	High		
Variables	β	SE	β	SE	β	SE	
English Learners	-0.0338	(0.216)	-0.307	(0.321)	-0.925	(0.408)	
Students with Disabilities	-0.557*	(0.261)	-0.814*	(0.292)	-1.043	(0.491)	
At-Risk	-0.458***	(0.106)	-0.764***	(0.187)	-0.875*	(0.357)	
Asian	-4.101	(6.533)	17.66	(17.11)	-1.616	(16.75)	
Black/African-American	-4.258	(6.403)	15.97	(17.09)	-0.530	(16.73)	
Hispanic/Latino of any race	-4.054	(6.434)	16.05	(17.07)	-0.125	(16.68)	
Two or more races	-4.717	(6.348)	15.71	(17.05)	-2.166	(16.39)	
Native Hawaiian/Other Pacific Islander	-5.141	(7.746)	12.74	(17.07)	-1.190	(23.65)	
White	-4.087	(6.417)	15.56	(17.14)	-0.432	(16.84)	
American Indian/Alaskan Native	-12.47	(7.701)	14.22	(17.83)	3.703	(17.33)	
Constant	503.5	(639.4)	-1490.4	(1711.1)	173.0	(1669.0)	
Observations	134		72		35		
<i>R</i> ²	0.568		0.571		0.817		

Table B.2: OLS Regression Analysis of Student Groups on School STAR Score by Framework

Linear regression of percent of population on school STAR score controlling for the percent of population of student group Note: Observations is the number of schools in the framework specified. Robust standard errors³ are shown in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

³ Robust standard errors are used to account for heteroscedasticity in the models. Robust standard errors are typically larger and provide a more conservative estimate of significance between variables, but can have unintended consequences with small population size.

Relationship between School Student Composition and STAR Score

Student Groups and Metric Score—Linear Regression Analysis

Table B.3 – Table B.5 explore the relationship between the percentage of students who are at-risk, student with disabilities, and English learners and schools' metric scores for the elementary, middle, and high school frameworks. Each table displays the adjusted R-square value for each linear regression model, which provides an indication of the percent of the difference in metric scores that can be explained by the percentage of each student group. Bold values represent a significant relationship between student population and the metric score.

Metric	Elementary School	Middle School	High School
CLASS - Classroom Organization	0.02		
CLASS - Emotional Support	0.058		
CLASS - Instructional Support	0.006		
pre-K In-Seat Attendance	0.517		
Growth to Proficiency - ELA	0.106	0.241	
Growth to Proficiency - Math	-0.001	0.106	
Median Growth Percentile ELA	0.322	0.146	
Median Growth Percentile Math	0.05	0.067	
90% Attendance	0.599	0.306	0.229
ACCESS Growth	-0.014	0.05	-0.105
Attendance Growth	-0.003	0.033	0.075
In-Seat Attendance	0.551	0.235	0.24
PARCC 3+/MSAA 3+ ELA	0.69	0.56	0.76
PARCC 3+/MSAA 3+ Math	0.495	0.589	0.686
PARCC 4+/MSAA 3+ ELA	0.675	0.667	0.802
PARCC 4+/MSAA 3+ Math	0.549	0.615	0.682
Re-enrollment	0.247	0.207	0.65
AP/IB Participation			0.409
AP/IB Performance			0.754
Extended Years Graduation Rate			0.45
Four-Year Graduation Rate			0.477
SAT College and Career Ready Benchn	nark		0.793
SAT DC Percentile			0.637

Table B.3: Linear Regression Analysis of Percentage of students who are At-risk on Metric Score, by Framework

Table B.4: Linear regression Analysis of Percentage of Students with Disabilities on Metric Score, by Framework

Metric	Elementary School	Middle School	High School
CLASS - Classroom Organization	-0.004		
CLASS - Emotional Support	-0.001		
CLASS - Instructional Support	-0.006		
pre-K In-Seat Attendance	0.027		

Growth to Proficiency - ELA	0.045	0.134	
Growth to Proficiency - Math	-0.008	0.1	
Median Growth Percentile ELA	0.118	0.091	
Median Growth Percentile Math	0.013	0.087	
90% Attendance	0.051	0.144	0.152
ACCESS Growth	-0.008	0.089	0.009
Attendance Growth	-0.007	0.048	0.026
In-Seat Attendance	0.061	0.146	0.182
PARCC 3+/MSAA 3+ ELA	0.163	0.217	0.668
PARCC 3+/MSAA 3+ Math	0.119	0.159	0.512
PARCC 4+/MSAA 3+ ELA	0.134	0.177	0.656
PARCC 4+/MSAA 3+ Math	0.118	0.141	0.538
Re-enrollment	0.019	0.016	0.347
AP/IB Participation			0.448
AP/IB Performance			0.483
Extended Years Graduation Rate			0.307
Four-Year Graduation Rate			0.374
SAT College and Career Ready			
Benchmark			0.61
SAT DC Percentile			0.527

Table B.5: Linear regression Analysis of Percentage of English Learners on Metric Score, by Framework

Metric	Elementary School	Middle School	High School
CLASS - Classroom Organization	0.06		
CLASS - Emotional Support	0.062		
CLASS - Instructional Support	0.068		
pre-K In-Seat Attendance	0.067		
Growth to Proficiency - ELA	0.043	0.029	
Growth to Proficiency - Math	0.013	-0.007	
Median Growth Percentile ELA	0.065	0.06	
Median Growth Percentile Math	0.02	0.011	
90% Attendance	0.174	0.005	0.047
ACCESS Growth	-0.019	0.052	0.106
Attendance Growth	0.009	0.01	0.049
In-Seat Attendance	0.175	-0.006	0.032
PARCC 3+/MSAA 3+ ELA	0.018	-0.014	0.048
PARCC 3+/MSAA 3+ Math	0.024	-0.014	0.04
PARCC 4+/MSAA 3+ ELA	0.007	-0.014	0.019
PARCC 4+/MSAA 3+ Math	0.01	-0.013	0.021
Re-enrollment	0.027	-0.014	-0.009
AP/IB Participation			0.005
AP/IB Performance			-0.028
Extended Years Graduation Rate			0.07
Four-Year Graduation Rate			0.066

Relationship between STAR metrics and domains and STAR Framework Scores

Three step-wise multivariate regression models examine the relationship between framework scores, the individual metrics of each framework domain, and student group membership (Tables B.6 – Table B.8). Table B.6 (elementary school), Table B.7 (middle school), and Table B.9 (high school) summarize a series of step-wise multiple regression models that were used to examine the extent to which schools' STAR framework scores are related to the individual metrics within the domains of the STAR Framework as well as schools' student group membership. Specifically, Model 1 examines each STAR metric and STAR scores. Model 2 adds a school's percentage of English learners, students with disabilities, student who are at-risk, and each race/ethnicity student group. For the Elementary School framework, CLASS and Pre-K Attendance were not included in the model due to the decreased number of elementary schools without these metrics. None of the framework models included ACCESS growth due to the small number of schools with a sufficient number of students to calculate this metric. For each framework, the final model *only* includes metrics and student groups that were statistically significant in prior models.

The results from this analysis reveal that the relationship between schools' racial/ethnic makeup and schools' framework scores is fully mediated by schools' performance on STAR metrics. This means that a significant amount of variance in schools' framework scores is explained by the metrics, so much so that there is no significant relationship between the demographic make-up of schools and their framework scores. Rather, schools' student group membership is associated with schools' metric performance; in turn, this metric performance is associated with schools' framework scores.

	(1)		(2)		(3)	
	ß	SE	ß	SE	ß	SE
Attendance Growth	0.147	(0.371)	0.365	(0.406)		
In-Seat Attendance	2.440^{*}	(1.038)	1.972	(1.155)		
90% Attendance	-0.181	(0.202)	-0.146	(0.236)		
Re-enrollment	0.161^{*}	(0.068)	0.161^{*}	(0.0729)	0.0640***	(0.018)
PARCC 3+/MSAA 3+ ELA	0.135	(0.110)	0.045	(0.126)		
PARCC 3+/MSAA 3+ Math	0.221*	(0.099)	0.157	(0.107)	0.0023	(0.015)
PARCC 4+/MSAA 3+ ELA	0.157	(0.103)	0.269*	(0.117)	0.0297	(0.016)
PARCC 4+/MSAA 3+ Math	0.027	(0.099)	0.064	(0.108)		
Growth to Proficiency – ELA	0.352***	(0.102)	0.292**	(0.111)	-0.0745*	(0.029)
Growth to Proficiency – Math	0.167	(0.114)	0.131	(0.118)		
Median Growth Percentile ELA	0.148	(0.114)	0.203	(0.124)	0.0828*	(0.032)
Median Growth Percentile Math	0.263*	(0.115)	0.309*	(0.119)	0.0050	(0.012)
English Learners			0.099	(0.103)		

Table B.6: Step-wise Multiple Regression of Metric Scores by Domain and Student Groups on School STAR Scores – Elementary Schools

Students with Disabilities			0 000	(0 103)		
			0.000	(0.105)		
At-Risk			-0.087	(0.0647)		
American Indian/Alaskan Native			2.528	(3.085)		
Asian			3.789	(2.571)		
Black/African-American			3.682	(2.526)		
Hispanic/Latino of any race			3.581	(2.533)		
Two or more races			3.564	(2.491)		
Native Hawaiian/Other Pacific Islander			1.324	(3.691)		
White			3.571	(2.523)		
Constant	-251.4**	(83.23)	-568.3*	(272.1)	87.03***	(1.512)
Observations	122		122		122	134
Adjusted R ²	0.937		0.936		0.473	0.502

Standard errors in parentheses

Linear regression of metric scores (grouped by domain) and proportion of student groups at a school on school STAR score.

^{*} *p* < 0.05, ^{**} *p* < 0.01, ^{***} *p* < 0.001

Table B.7: Step-wise Multiple Regression of Metric Scores by Domain and Student Groups on School STAR Score – Middle Schools

	(1)		(2)		(3)	
	ß	SE	ß	SE	ß	SE
Attendance Growth	2.630**	(0.895)	2.499*	(0.963)	3.732***	(0.945)
In-Seat Attendance	-2.786*	(1.213)	-1.881	(1.306)	-3.896**	(1.298)
90% Attendance	0.667*	(0.264)	0.414	(0.283)	0.866**	(0.287)
Re-enrollment	0.114	(0.123)	0.135	(0.128)	-0.017	(0.127)
PARCC 3+/MSAA 3+ ELA	0.190	(0.166)	0.335	(0.183)	0.495***	(0.090)
PARCC 3+/MSAA 3+ Math	0.370*	(0.166)	0.350*	(0.173)	0.419***	(0.082)
PARCC 4+/MSAA 3+ ELA	0.071	(0.151)	-0.217	(0.186)		
PARCC 4+/MSAA 3+ Math	0.071	(0.177)	0.122	(0.196)		
Growth to Proficiency - ELA	0.022	(0.301)	0.021	(0.318)		
				. ,		
Growth to Proficiency - Math	0.136	(0.225)	0.113	(0.255)		
,		ι <i>γ</i>		,		
Median Growth Percentile ELA	0.301	(0.245)	0.255	(0.266)		
		()		()		
Median Growth Percentile Math	0.097	(0.180)	0.165	(0.197)		
English Learners			0.009	(0.160)		
Students with Disabilities			-0.050	(0.133)		
At-Risk			-0.064	(0.098)		
American Indian/Alaskan Native			0.223	(12.33)		
Asian			-4.173	(12.15)		
Black/African-American			-4.149	(12.11)		
Hispanic/Latino of any race			-4.124	(12.11)		
Two or more races			-4.988	(12.10)		
Native Hawaiian/Other Pacific Islander			-3.412	(12.29)		
White			-3.851	(12.11)		
Constant	185.1	(95.88)	537.2	(1197.3)	295.2**	(101.5)
Observations	72	· · ·	72		72	· · ·
Adjusted R ²	0.911		0.916		0.888	

Standard errors in parentheses

Linear regression of metric scores (grouped by domain) and proportion of student groups at a school on school STAR score.

* p < 0.05, ** p < 0.01, *** p < 0.001

Table B.8: Step-wise Multiple Regression of Metric Scores by Domain and Student Groups on STAR
Scores – High Schools

	(1)		(2)		(3)	
	ß	SE	ß	SE	ß	SE
Attendance Growth	1.270	(0.623)	0.066	(1.299)		
In-Seat Attendance	0.237	(0.417)	1.414	(1.287)		
90% Attendance	-0.168	(0.182)	-0.390	(0.567)		
Re-enrollment	0.330	(0.311)	-0.248	(0.965)		
AP/IB Participation	0.101	(0.0693)	0.436	(0.297)		
AP/IB Performance	0.101	(0.122)	0.462	(0.486)	0.628***	(0.093)
Extended Years Graduation Rate	0.853	(0.460)	-0.087	(1.395)		
Four-Year Graduation Rate	-0.762	(0.485)	0.184	(1.242)	1.067***	(0.146)
SAT College and Career Ready	-0.164	(0.287)	0.112	(0.530)		
Benchmark						
SAT DC Percentile	0.058	(0.133)	-0.088	(0.373)		
PARCC 3+/MSAA 3+ ELA	0.782**	(0.249)	1.423	(0.629)		
PARCC 3+/MSAA 3+ Math	0.504**	(0.161)	0.620	(0.286)		
PARCC 4+/MSAA 3+ ELA	-0.517	(0.277)	-1.238	(0.706)		
PARCC 4+/MSAA 3+ Math	0.221	(0.259)	0.066	(0.571)		
English Learners			0.564	(0.451)		
Students with Disabilities			2.049	(1.087)		
At-Risk			-0.283	(0.385)		
				. ,		
American Indian/Alaskan Native			12.29	(40.20)		
·				ι γ		
Asian			20.31	(39.47)		
			20101	(00117)		
Black/African-American			22 47	(42 58)		
Shaciy, intern and the state			22.17	(12.30)		
Hispanic/Latino of any race			22.23	(12 25)		
			22.25	(42.23)		
Two or more races			26.27	(11 11)		
Two of more faces			20.27	(44.14)		
Nativo Hawaijan/Othor Pacific Islandor			0 0 7 0	(56.20)		
Native Hawalian/Other Pacific Islander			0.020	(50.20)		
\M/bito			22.25	(42.00)		
winte			22.25	(42.90)		
Constant	F2 10	(22.11)	2200.4	(4170.2)	F2 C0***	(11.25)
Observations	-52.19	(32.11)	-2390.1	(41/0.3)	-52.00	(11.25)
Observations	27		27		29	
Aajustea K ²	0.979		0.981		0.870	

Standard errors in parentheses

Linear regression of metric scores (grouped by domain) and proportion of student groups at a school on school STAR score.

* p < 0.05, ** p < 0.01, *** p < 0.001

Appendix C

Growth Metrics and the STAR Rating

STAR Framework under Different Achievement and Growth Methodologies

The following section investigates the relative influence of achievement and growth metrics on the STAR Framework by examining actual versus hypothetical STAR scores and rating distributions under different

framework scenarios that include or exclude achievement and growth metrics from the STAR Framework. Through these analyses OSSE does not suggest removing any of the metrics or domains from the STAR Framework; instead, these analyses serve as a way to view the importance of each metric and domain in the STAR Framework.

In the figures below, each point represents a school and the color of the point demonstrates a change in the STAR rating from a schools' actual STAR score compared to a hypothetical score calculated under each scenario; the highlighted boxes in grey show the region where STAR ratings would stay the same under the actual versus hypothetical scenario. Each figure also includes the line of best fit with the slope noted at the bottom; this linear coefficient indicates how much it is expected the actual STAR score would change for a 1 unit increase in the hypothetical score,.

Figure C.1 compares schools' actual STAR scores against hypothetical scores resulting from an accountability framework which only included the PARCC/MSAA achievement metrics and did not include growth metrics. The plotted line shows the linear relationship between scores generated with only PARCC/MSAA achievement metrics and actual STAR scores. The y-intercept of 22 can be read as the expected STAR score for schools with an achievement-only hypothetical score of zero. The slope of 0.657 means that for every one-point increase in the achievement-only hypothetical score, the actual STAR score is expected to increase by 0.657. The plotted line illustrates that lower-performing schools tend to achieve higher STAR scores under the actual STAR Framework (when all accountability metrics are included). Results from this analysis reveal that if the STAR Framework only included PARCC/MSAA achievement metrics, the ratings for approximately 60% of schools would change, with the STAR Ratings for many two- and three-star schools decreasing, and the ratings for four-star schools both decreasing and increasing.

Specifically, at the lower end of the hypothetical score scale, most schools fall above the highlighted boxes which shows that among schools that would have earned one-, two-, and three-star ratings based solely on their PARCC/MSAA achievement, the presence of other metrics in the STAR Framework resulted in many schools receiving a higher STAR Rating. Collectively these results reveal that schools must perform well on other metrics within the STAR Framework to earn higher STAR ratings; high performance on achievement metrics alone does not result in four- or five-star ratings.



Figure C.1: STAR Framework with only PARCC/MSAA Achievement Metrics

Figure C.2 examines a hypothetical scenario where schools' STAR scores are calculated without the inclusion of any PARCC/MSAA achievement metrics, an option not permitted by federal law. Purely for statistical analysis, we reviewed the results which showed that the PARCC/MSAA achievement metrics were excluded from the STAR Framework, the STAR Rating for approximately two-thirds of schools would not change; for those schools that would have a change, these schools would have performed better in the hypothetical accountability system where PARCC/MSAA achievement was not included.



Figure C.2: STAR Framework without PARCC/MSAA Achievement Metrics

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Figure C.3 examines the hypothetical scenario where the STAR Framework includes only PARCC growth metrics (Median Growth Percentile and Growth to Proficiency).⁴ This analysis shows considerable variability and that the STAR Ratings would change for approximately half of all schools under this condition.





Figure C.4 examines the hypothetical scenario where the STAR Framework excludes both PARCC growth metrics (Median Growth Percentile and Growth to Proficiency). Results from this analysis reveal that with the removal of PARCC growth metrics the STAR Ratings would change for approximately half of schools, with the STAR Ratings for many two-star schools decreasing, and the ratings for four-star schools increasing.

⁴ All analyses featuring the inclusion or absence of growth metrics only includes schools which had growth metrics in this year's STAR Score. As a result, all high schools and elementary schools that only go up to grade 3 are excluded.



Figure C.4: STAR Framework without PARCC Growth Metrics

Finally, Figure C.5 examines the distribution of STAR scores and ratings if the STAR Framework excluded all PARCC/MSAA achievement and PARCC growth metrics. This scenario appears to be the most variable scenario explored with STAR ratings for approximately 15% of schools increasing and STAR ratings for approximately 40% of schools decreasing.



Figure C.5: STAR Framework without all PARCC and MSAA Achievement and Growth Metrics

Change in STAR Rating • No • Yes

Linear Coefficient = 0.775

Achievement by Growth and STAR Rating

Figures C.6 through C.9 explore the relationship between performance on growth metrics and academic achievement and a schools' STAR Rating. Each plot point represents a school's growth metric score compared against the school's score on the PARCC 4+/MSAA 3+ metric, with each plot point colored by the school's framework STAR score.

Elementary School Framework

Figures C.6 and C.7 demonstrate that there is a weak relationship between Growth to Proficiency and PARCC 4+/MSAA 3+ in the Elementary School framework. While the vertical distribution of STAR Ratings shows a relationship between STAR scores and performance on PARCC 4+/MSAA 3+, the relationship between STAR scores and Growth to Proficiency is weaker, particularly among schools with one-, two-, and three-star ratings. Similar levels of growth are associated with a wide range of STAR scores; this effect is more pronounced for Growth to Proficiency than Median Growth Percentile. For example, a metric score of around 50 in Growth to Proficiency – ELA for elementary schools is associated with STAR scores that range from 13 to 77.

Figure C.6: Growth to Proficiency - ELA, All Students



Figure C.7: Growth to Proficiency - Math, All Students



Growth to Proficiency - Math

Middle School Framework

Figure C.8 displays generally a positive relationship between Growth to Proficiency and PARCC 4+/MSAA 3+ in the Middle School framework. In contrast to the Elementary School framework, the STAR Ratings for the Middle School framework more closely align to overall performance on the Growth to Proficiency and PARCC 4+/MSAA 3+metrics. These analyses further support findings in Table B.6 and B.7 that metrics are more highly correlated in the Middle School framework than in the Elementary School framework.

Figure C.8: Growth to Proficiency - ELA, All Students



Figure C.9: Growth to Proficiency - Math, All Students



ELA Growth Metric Scores by Framework

Figures C.10 through C.17 show the relationship between schools' performance on the ELA Growth to Proficiency and Median Growth Percentile metrics and STAR score, by framework. While weaker than the corresponding relationship between achievement and STAR Scores, these analyses demonstrate a positive association between ELA Growth metric scores and STAR scores for all schools in each framework. Much like the trends observed for achievement metrics, similar performance levels on growth metrics are associated with a wide range of STAR scores; this effect is more pronounced for Growth to Proficiency than Median Growth Percentile. Following each figure is a residual plot showing the distribution of residuals⁵ from the linear model fitted line. These residual plots underscore the finding that although there is a strong association between schools' performance on academic growth and their STAR rating, for both elementary and middle school frameworks, similar levels of growth correspond to a wide range of STAR scores.

⁵ Residuals reflect the difference between the fitted line and observed plot points.



Figure C.10: Elementary School Framework ELA Growth to Proficiency







Figure C.12: Elementary School Framework ELA Median Growth Percentile

Figure C.13: Elementary School Framework ELA Median Growth Percentile—Distribution of Residuals





Figure C.14: Middle School Framework ELA Growth to Proficiency







Figure C.16: Middle School Framework ELA Median Growth Percentile





Relationship between STAR metrics and STAR Framework Scores by Domain

This series of step-wise multiple regression models examines the extent to which framework scores are related to the metrics in each domain, controlling for school and student characteristics. First, each Model 1 begins by including the metrics for the following domains: Achievement (Table C.1), Growth (Table C.2), and School Environment (Table C.3). Next, Model 2 adds framework, framework size, school size, and sector as well as the percentage of English learners, students with disabilities, and students

who are at-risk.

Two insights emerge from these analyses. First, Academic Growth metrics explain approximately 76 percent (R^2 =.759) of differences in framework scores; Academic Achievement metrics explain approximately 77 percent (R^2 =.774); and School Environment metrics explain approximately 55 percent (R^2 =.545). Second, when taking school characteristics into account, a school's percentage of English learners has a significant and positive association with framework scores. This indicates that after accounting for the relationship between academic achievement and STAR scores, on average, a higher proportion of English learners in a school is associated with higher STAR scores. Findings from the other models are consistent with previously reported findings.

	(1	L)	(2	<u>!)</u>
	Framewo	, ork Score	Framewo	, ork Score
Variables	β	SE	β	SE
PARCC 3+/MSAA 3+ ELA	0.518***	(0.109)	0.574 ^{***}	(0.117)
PARCC 3+/MSAA 3+ Math	0.459***	(0.102)	0.504***	(0.101)
PARCC 4+/MSAA 3+ ELA	0.313**	(0.110)	0.072	(0.119)
PARCC 4+/MSAA 3+ Math	-0.319**	(0.111)	-0.116	(0.110)
Middle School			4.976*	(1.961)
High School			14.52***	(2.394)
School Size			0.003	(0.005)
Framework Size			-0.006	(0.005)
Sector			0.634	(1.379)
English Learners			0.148***	(0.043)
Students with Disabilities			-0.076	(0.121)
At-Risk			0.026	(0.052)
Constant	-3.500	(3.077)	-14.36	(8.775)
Observations	241		241	
Adjusted R ²	0.774		0.810	

Table C.1: Stepwise Multiple Regression of PARCC/MSAA Achievement and Student Characteristics on Framework STAR Score

Standard errors in parentheses

Linear regression of student group characteristics, PARCC/MSAA achievement scores on Framework score controlling for student groups, framework and size. Framework is categorical, using elementary schools as the base and sector is a binary variable where charter=0 and DCPS=1. There are significant model differences between model 1 & 2.

* p < 0.05, ** p < 0.01, *** p < 0.001

Table C.2: Stepwise Multiple Regression of Academic Growth and Student Characteristics on Framework STAR Score

	(1	L)	(2)
	Framewo	ork Score	Framewo	rk Score
Variables	β	SE	β	SE
Growth to Proficiency – ELA	1.317	(1.753)	3.659**	(1.150)
Growth to Proficiency –	-0.325	(2.041)	2.164	(1.326)
Math				
Median Growth Percentile	11.62***	(1.818)	4.974***	(1.275)
ELA				
Median Growth Percentile	8.647***	(2.111)	6.382***	(1.372)

Math				
Middle School			1.730	(1.261)
School Size			-0.006	(0.004)
Framework Size			0.007	(0.004)
Sector			-1.576	(1.051)
English Learners			-0.035	(0.030)
Students with Disabilities			-0.126	(0.091)
At-Risk			-0.386***	(0.026)
Constant	49.69***	(0.741)	77.96***	(4.729)
Observations	194		194	
Adjusted R^2	0 759		0 902	

Standard errors in parentheses

Linear regression of student group characteristics, normalized PARCC growth scores on Framework score controlling for student groups, framework and size. Framework is categorical, using elementary schools as the base and sector is a binary variable where charter=0 and DCPS=1. There are significant model differences between model 1 & 2.

* p < 0.05, ** p < 0.01, *** p < 0.001

Table C.3: Stepwise Multiple Regression of School Environment and Student Characteristics on

Framework STAR Score

	(1	(1))
	Framewo	ork Score	Framewo	rk Score
Variables	β	SE	β	SE
Attendance Growth	-0.0441	(1.088)	1.230	(0.975)
In-Seat Attendance	3.533	(4.031)	3.727	(3.601)
90% Attendance	8.255*	(4.159)	3.009	(3.798)
Re-enrollment	6.657***	(1.176)	4.809***	(1.098)
Middle School			2.240	(2.338)
High School			3.333	(2.662)
School Size			0.010	(0.007)
Framework Size			-0.008	(0.007)
Sector			3.874^{*}	(1.865)
English Learners			-0.108	(0.057)
Students with Disabilities			-0.662***	(0.153)
At-Risk			-0.312***	(0.058)
Constant	49.44***	(0.948)	57.24***	(9.201)
Observations	241		241	
Adjusted R ²	0.545		0.652	

Standard errors in parentheses

Linear regression of student group characteristics, normalized common School Environment scores on Framework score controlling for student groups, framework and size. Framework is categorical, using elementary schools as the base and sector is a binary variable where charter=0 and DCPS=1. There are significant model differences between model 1 & 2.

* p < 0.05, ** p < 0.01, *** p < 0.001

Appendix D

Addressing Chronic Absenteeism

90% Attendance

Figure D.1 shows the distribution of schools' attendance and 90% Attendance metric scores by framework. The solid black line represents the metric floor and a dotted line represents the metric target. Findings reveal that nearly all high schools earned points on the 90% Attendance metric indicating that attendance rates improved at many DC high schools relative to the 2016-17 school year (on which benchmarks were developed). At the same time, rates of chronic absenteeism elementary and middle schools increased in the 2017-18 school year with a number of elementary and middle schools earning zero points on 90% Attendance metric on the STAR Framework.



Figure D.1: Distribution of Attendance by Framework

Attendance Growth

Figures D.2 through D.4 show the school-level relationship between Attendance Growth and 90% Attendance, the two measures that comprise the Addressing Chronic Absenteeism metric. Addressing Chronic Absenteeism offers schools a "best of" either 90% Attendance or Attendance Growth, rewarding schools who have consistently high attendance, as well as those schools who have made strides in improving their attendance. In the following charts, if a school is above the diagonal line, the school earned a greater percentage of points on 90% Attendance, while those below the line earned a greater share of points on Attendance Growth.

Figure D.2 and Figure D.3 illustrate that there is no clear relationship between Attendance Growth and 90% Attendance for schools in the Elementary School framework, among both the all students and at-

risk student groups. Whereas nearly all four and five-star schools earn a greater share of points in 90% Attendance, the majority of schools earning a one, two, and three-star rating earn more points in Attendance Growth. There are a number of schools earning one and two-star ratings with 0 points earned on 90% attendance who were able to earn points on Attendance Growth.



Figure D.2: Elementary School Framework—All Students





Similar to the relationship observed for the Elementary School framework, Figure D.4 and Figure D.5 indicate that there is no clear relationship between Attendance Growth and 90% Attendance for schools in the Middle School framework, both among all students and students who are at-risk. However, there appears to be a more even distribution in STAR Ratings corresponding to the metrics in which schools are earning a greater proportion of points.



Figure D.4: Middle School Framework—All Students





Figure D.6 and Figure D.7 show the two attendance metrics are more related among schools in the High School framework compared to the Elementary and Middle School frameworks, both for the all students group and among students who are at-risk. In contrast to the relationship between 90% attendance and attendance growth within the Elementary and Middle School frameworks, schools in the High School framework with lower performance on Attendance Growth also tend to have lower performance on 90% Attendance.



Figure D.6: High School Framework—All Students



