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easyCBM® Mathematics Criterion Related Validity Evidence: Oregon State Test

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Abstract

In this technical report, we present the results of a study examining the relation between the math measures available on the easyCBM® online benchmark and progress monitoring assessment system and the Oregon statewide assessment of mathematics. Designed for use within a response to intervention (RTI) framework, easyCBM® is intended to help educators identify students who may be at risk for failure. Often, students deemed at-risk are those who would not be predicted to pass the state test. In Oregon, new performance level standards were adopted for the 2010-2011 school year. We use regression and correlation analyses to examine the relation between easyCBM® and Oregon's state test, paying particular attention to the predictive accuracy given the new performance standards.

easyCBM® Criterion-Related Validity Evidence: Oregon State Test

In this technical report, we present the results of a study of the criterion validity of easyCBM® math at grades 3-8. The Oregon Assessment of Knowledge and Skills (OAKS), Oregon's state test used for accountability purposes, was used as the criterion. The OAKS was administered at the end of the school year, while easyCBM® was administered tri-annually. Thus, we examine easyCBM® for both its predictive validity, with the fall and winter measures predicting the MSP, and its concurrent validity, with the relation between the spring measure and MSP examined.

The easyCBM® Progress Monitoring Assessments

The online easyCBM® progress monitoring assessment system was launched in September 2006 as part of a Model Demonstration Center on Progress Monitoring funded by the Office of Special Education Programs (OSEP). At the time this technical report was published, 92,925 teachers had registered easyCBM® accounts, representing schools and districts spread across every state in the country. During the 2008-2009 school year, an average of 305 new accounts were registered each week, and the popularity of the system continues to grow. In the month of October 2010, alone, 11,885 new teachers registered for accounts. The online assessment system provides both universal screener assessments for fall, winter, and spring administration and multiple alternate forms of a variety of progress monitoring measures designed for use in K-8 school settings.

As part of state funding for Response to Intervention (RTI), states need technically adequate measures for monitoring progress. Given the increasing popularity of the easyCBM® online assessment system, it is imperative that a thorough analysis of the measures' technical adequacy be conducted and the results shared with research and practitioner communities. This

technical report addresses that need directly, providing the results of a study examining the predictive and concurrent validity evidence supporting the use of the easyCBM® assessments in mathematics in Oregon state schools. A further purpose of this study was to examine the relation of easyCBM® to OAKS given the newly adopted OAKS performance level standards. For instance, while previous studies have shown easyCBM® to be strong a strong predictor of OAKS classification (Anderson, Park, & Tindal, 2010), will this predictive utility change with the new standards?

Methods

Setting and Subjects

Three Oregon public school districts participated in this study. Table 1 details the demographics of the sample by district and grade. The sample differed by district. In Districts 1 and 2, all students present on the day of testing were included. In District 3, easyCBM® was administered to a subset of students designed to match the population of students within the district.

Measures and Analyses

The easyCBM® mathematics tests used in this study contain 45 multiple-choice mathematics items, written specifically to address grade-level content knowledge and skills as described in the National Council of Teachers of Mathematics (NCTM) Focal Point Standards. These benchmark / screening assessments are designed to identify students at risk for failing to meet state content standards, giving educators the opportunity to provide additional instructional interventions targeted to students' needs. They are intended to be computer-administered in a group setting, with the students' classroom teachers supervising the test administration. For a full description of easyCBM® math, including its purpose and development, see Alonzo, Lai, and

Tindal (2009a, 2009b, 2009c), Alonzo and Tindal (2009a, 2009b), and Lai, Alonzo, and Tindal (2009a, 2009b, 2009c).

The OAKS is a computer adaptive assessment administered in grades 3-8. Student scores are reported in Rasch Units – a continuous scale ranging from 0 to infinity. However, the Oregon Department of Education reports that most scores range from 150-300 (Oregon Department of Education, 2010).

Data Analysis

To examine the predictive and concurrent validity of easyCBM® we conducted regression and correlation analyses. Four separate regression models were conducted at each grade level. First, a full model was run, which included all easyCBM® assessments administered throughout the year. This model provided an indication of the total relation between easyCBM® and OAKS. Second, individual models were conducted for each seasonal administration. For the seasonal models, only the students' total score for the seasonal benchmark was entered as a predictor. Correlations are reported in both the full model and the individual models. To visually represent the relation between easyCBM® and the OAKS, and to examine the impact of the newly adopted OAKS performance standards, scatterplots were produced for each seasonal administration. On each scatterplot, students' OAKS scores are plotted along the y-axis, and their easyCBM® scores are plotted along the x-axis. The vertical lines on each plot represent the 20th and 50th percentiles of normative achievement on easyCBM®, while the horizontal lines represent the newly proposed cut scores for meeting and exceeding expectations on the OAKS.

Results

The results of the regression analyses and all scatterplots are reported by grade in pages 10-68. Overall, the full model accounted for between 64% and 75% of the variance in OAKS, while the individual models accounted for between 48% and 68% of the variance in OAKS.

Discussion

The results of this study suggest a strong relation between easyCBM® and the OAKS. An investigation of the scatterplots indicates that the changes in the OAKS performance level standards did not affect the potential for easyCBM® to classify students as at-risk for failure accurately. The relation between the OAKS and easyCBM® was found to be the strongest in the upper grades; however, even at the lower grades the relation appeared strong.

References

Alonzo, J., Lai, C., & Tindal, G. (2009a). *The development of K-8 progress monitoring measures in mathematics for use with the 2% and general education populations: Grade 3* (Technical Report No. 0902). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Alonzo, J., Lai, C., & Tindal, G. (2009b). *The development of K-8 progress monitoring measures in mathematics for use with the 2% and general education populations: Grade 4* (Technical Report No. 0903). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Alonzo, J., Lai, C., & Tindal, G. (2009c). *The development of K-8 progress monitoring measures in mathematics for use with the 2% and the general education populations: Grade 2* (Technical Report No. 0920). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Alonzo, J., & Tindal, G. (2009a). *The development of K-8 progress monitoring measures in mathematics for use with the 2% and general education populations: Grade 1* (Technical Report No. 0919). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Alonzo, J., & Tindal, G. (2009b). *The development of K-8 progress monitoring measures in mathematics for use with the 2% and general education populations: Kindergarten* (Technical Report No. 0921). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Anderson, D., Park, B. J., & Tindal, G. (2010). *An Examination of the easyCBM® Benchmark Tests and the Oregon Statewide Tests in Grades 6-8 Mathematics*. Paper presented at the annual conference of the American Educational Research Association, Denver, CO.

Lai, C., Alonzo, J., & Tindal, G. (2009a). *The development of K-8 progress monitoring measures in mathematics for use with the 2% and general education populations: Grade 7* (Technical Report No. 0908). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Lai, C., Alonzo, J., & Tindal, G. (2009b). *The development of K-8 progress monitoring measures in mathematics for use with the 2% and general education populations: Grade 8* (Technical Report No. 0904). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Lai, C., Alonzo, J., & Tindal, G. (2009c). *The development of K-8 progress monitoring measures in mathematics for use with the 2% and the general education populations: Grade 6* (Technical Report No. 0907). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Oregon Department of Education. (2010). Assessment scoring: Frequently asked questions about scoring statewide assessments Retrieved April 21, 2010, from http://www.ode.state.or.us/apps/faqs/index.aspx?=88

Table 1
Demographics

Grade	*n*	% ELL	% Econ Dis	% SPED	Sex		% Ethnicity						
					% M	% F	Amer Ind	Asian/Pac Islander	Black	Hispanic	White	Multi	Decline/ Missing
District 1													
3	1311	4.7	44.3	15.9	52.8	47.2	1.7	4.7	2.4	10.1	73.2	3.1	4.8
4	1299	4.4	44.7	17.4	50.7	49.3	1.9	4.4	2.8	11.6	70.1	4.6	4.4
5	1357	3.7	43.6	17.4	51.7	48.3	1.8	5.2	2.6	9.9	71.2	3.8	5.5
6	1329	4.0	38.1	18.7	47.9	46.9	2.6	4.8	2.6	9.2	67.3	2.9	1.7
7	1262	3.0	39.8	15.5	47.5	52.5	1.5	5.9	2.8	10.5	70.6	4.6	1.7
8	1298	2.3	38.6	13.7	50.2	49.8	.9	4.7	2.8	10.9	69.0	4.9	6.8
District 2													
3	870	1.1	61.8	17.0	51.0	49.0	1.7	2.0	1.4	19.8	67.0	2.2	6.0
4	818	-	63.3	19.8	57.5	42.5	2.1	1.8	1.6	17.0	66.5	4.0	6.9
5	876	1.4	60.3	19.3	51.8	48.2	2.4	2.1	1.6	16.7	67.9	4.1	5.3
6	846	1.5	58.0	16.9	49.6	50.4	2.6	1.4	1.7	14.9	70.7	3.5	5.2
7	737	3.0	58.3	15.9	52.5	47.5	2.2	1.6	1.1	18.6	67.8	2.8	5.9
8	843	1.9	55.5	15.8	52.1	47.9	1.5	1.4	2.3	16.3	70.6	3.0	5.0
District 3													
3	1707	18.7	-	13.1	51.5	48.4	0.0	7.0	1.9	33.7	52.0	1.5	4.0
4	1623	15.2	-	12.0	51.6	48.3	0.0	7.7	2.2	34.6	49.7	1.7	4.2
5	1618	13.8	-	13.4	52.9	47.0	0.0	8.0	3.1	33.7	49.5	.9	4.8
6	1613	11.9	-	13.0	51.5	48.5	0.7	7.1	2.4	34.0	50.7	1.1	4.1
7	1643	9.3	-	12.4	51.4	48.5	0.9	6.8	2.3	29.1	55.3	1.3	4.4
8	1608	9.1	-	13.2	54.1	45.9	1.0	6.3	2.4	33.3	51.7	1.6	3.7

Grade 3

Full Model

Descriptive Statistics

	Mean	Std. Deviation	N
OAKSMathTot	211.79	9.589	1707
fall_tot	29.00	6.177	1707
wint_tot	32.63	6.192	1707
spr_tot	36.18	5.875	1707

Correlations

		OAKSMathTot	fall_tot	wint_tot	spr_tot
Pearson Correlation	OAKSMathTot	1.000	.705	.698	.736
	fall_tot	.705	1.000	.699	.684
	wint_tot	.698	.699	1.000	.739
	spr_tot	.736	.684	.739	1.000
Sig. (1-tailed)	OAKSMathTot	.	.000	.000	.000
	fall_tot	.000	.	.000	.000
	wint_tot	.000	.000	.	.000
	spr_tot	.000	.000	.000	.
N	OAKSMathTot	1707	1707	1707	1707
	fall_tot	1707	1707	1707	1707
	wint_tot	1707	1707	1707	1707
	spr_tot	1707	1707	1707	1707

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.797[a]	.635	.635	5.797

a. Predictors: (Constant), spr_tot, fall_tot, wint_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	99659.859	3	33219.953	988.689	.000[a]
	Residual	57220.796	1703	33.600		
	Total	156880.655	1706			

a. Predictors: (Constant), spr_tot, fall_tot, wint_tot

b. Dependent Variable: OAKSMathTot

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	165.468	.889		186.111	.000					
	fall_tot	.471	.034	.304	13.915	.000	.705	.320	.204	.450	2.222
	wint_tot	.323	.037	.209	8.829	.000	.698	.209	.129	.383	2.609
	spr_tot	.611	.038	.374	16.163	.000	.736	.365	.237	.399	2.505

a. Dependent Variable: OAKSMathTot

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	fall_tot	wint_tot	spr_tot
1	1	3.958	1.000	.00	.00	.00	.00
	2	.023	13.143	.69	.27	.03	.00
	3	.012	18.319	.15	.72	.47	.07
	4	.007	23.145	.16	.02	.49	.93

a. Dependent Variable: OAKSMathTot

Fall Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.694[a]	.482	.481	6.949

a. Predictors: (Constant), fall_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	148021.674	1	148021.674	3065.350	.000[a]
	Residual	159352.628	3300	48.289		
	Total	307374.302	3301			

a. Predictors: (Constant), fall_tot

b. Dependent Variable: OAKSMathTot

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	180.471	.580		311.140	.000
	fall_tot	1.065	.019	.694	55.366	.000

a. Dependent Variable: OAKSMathTot

Winter Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.696[a]	.484	.484	7.145

a. Predictors: (Constant), wint_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	102571.090	1	102571.090	2009.097	.000[a]
	Residual	109152.020	2138	51.053		
	Total	211723.110	2139			

a. Predictors: (Constant), wint_tot

b. Dependent Variable: OAKSMathTot

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	176.645	.796		221.789	.000
	wint_tot	1.086	.024	.696	44.823	.000

a. Dependent Variable: OAKSMathTot

Spring Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.735[a]	.540	.540	6.462

a. Predictors: (Constant), spr_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	153021.002	1	153021.002	3664.088	.000[a]
	Residual	130173.324	3117	41.762		
	Total	283194.326	3118			

a. Predictors: (Constant), spr_tot

b. Dependent Variable: OAKSMathTot

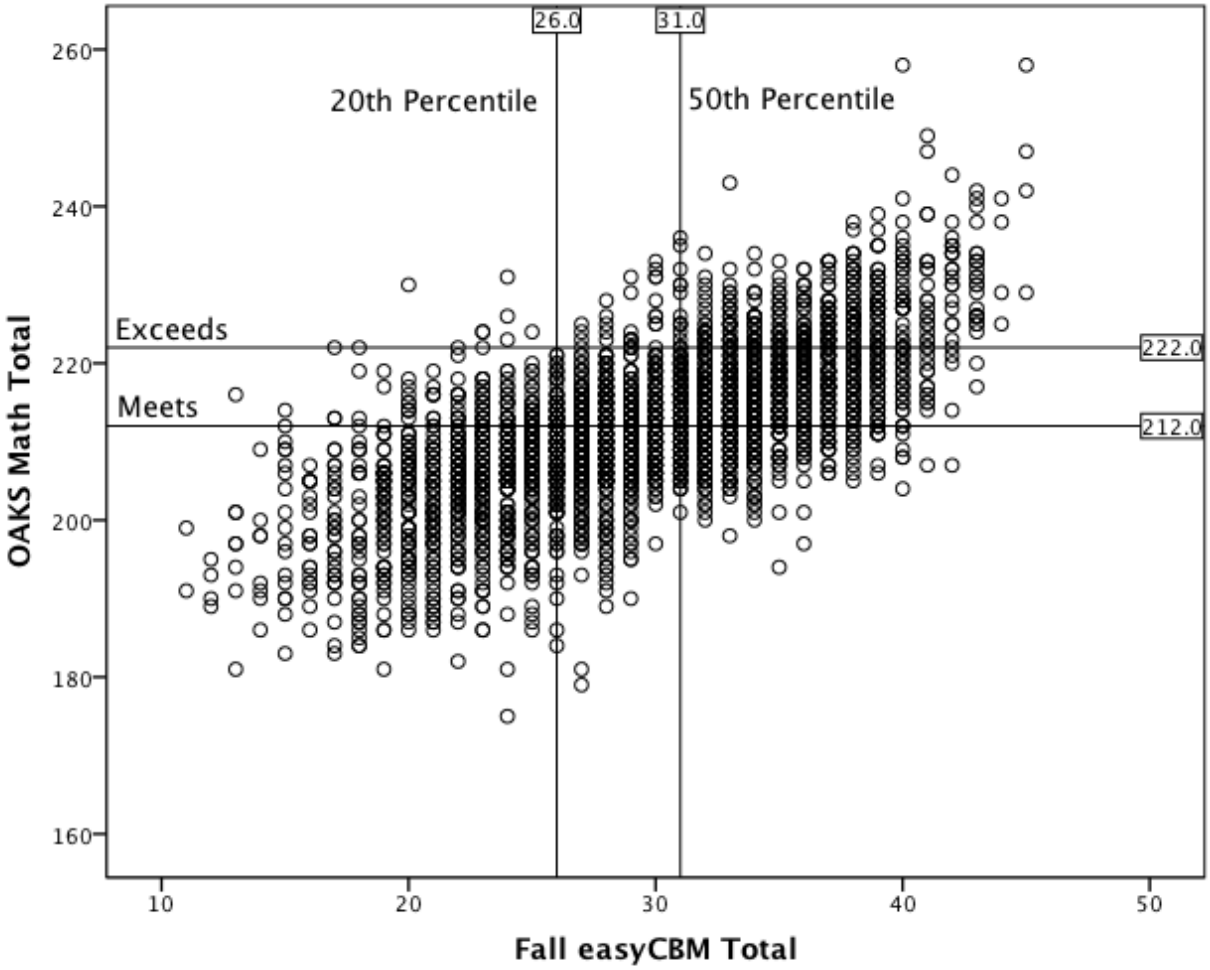
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	167.358	.745		224.594	.000
	spr_tot	1.211	.020	.735	60.532	.000

a. Dependent Variable: OAKSMathTot

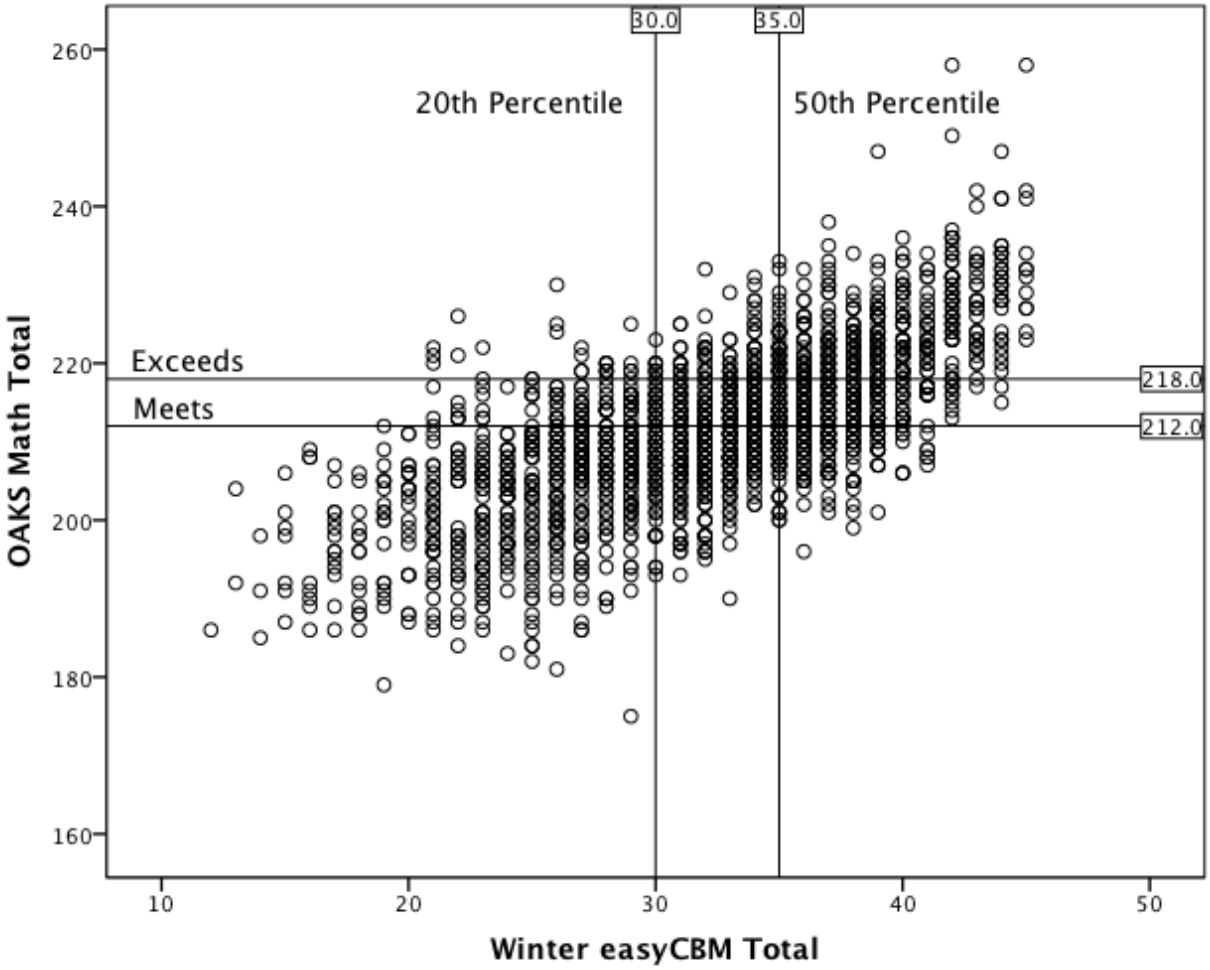
Scatterplot

Grade 3 - Fall easyCBM® and OAKS



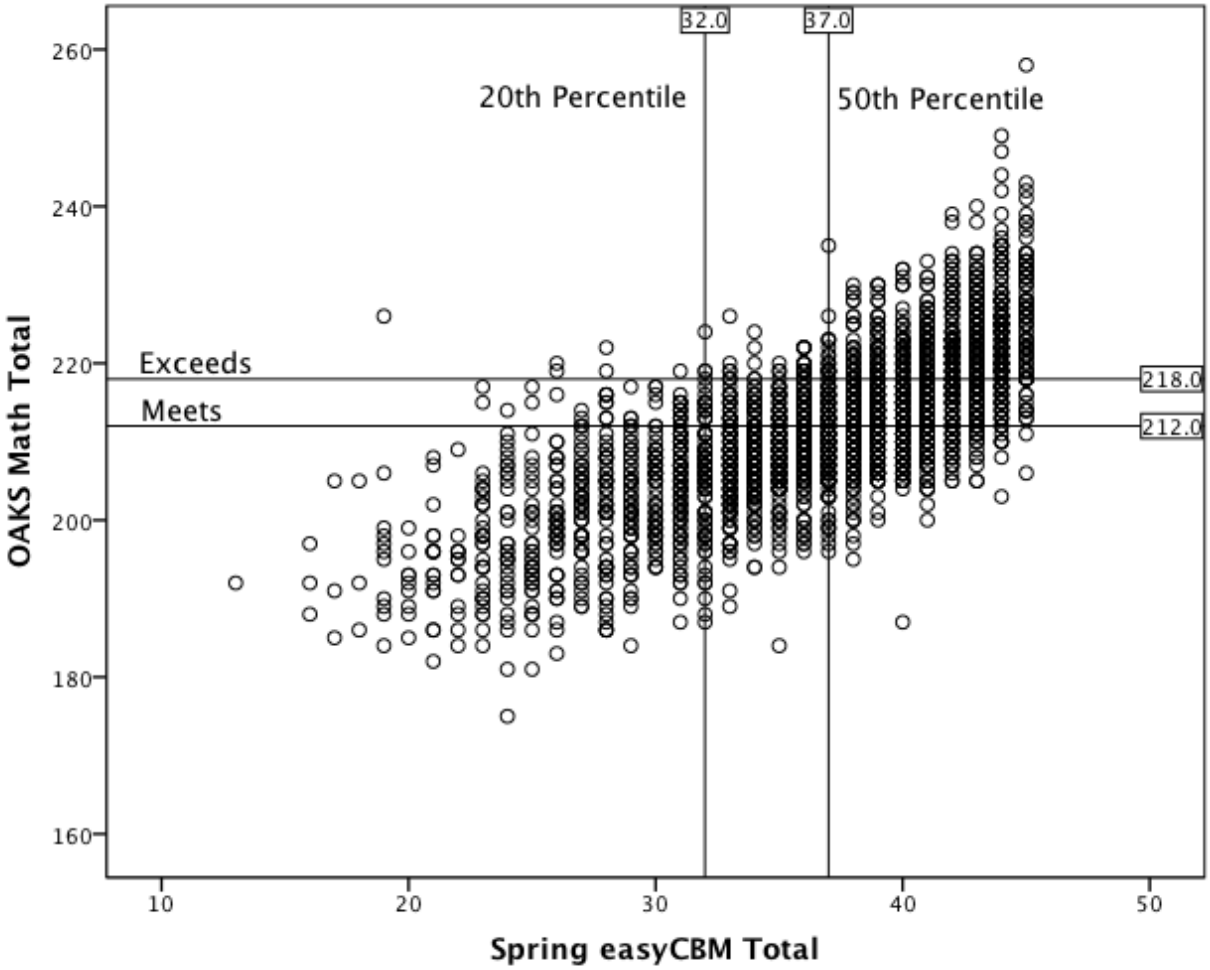
Scatterplot

Grade 3 - Winter easyCBM® and OAKS



Scatterplot

Grade 3 - Spring easyCBM® and OAKS



Grade 4

Full Model

Descriptive Statistics

	Mean	Std. Deviation	N
OAKSMathTot	218.99	9.717	1500
fall_tot	30.44	6.614	1500
wint_tot	31.99	6.177	1500
spr_tot	34.57	6.313	1500

Correlations

		OAKSMathTot	fall_tot	wint_tot	spr_tot
Pearson Correlation	OAKSMathTot	1.000	.738	.724	.742
	fall_tot	.738	1.000	.752	.740
	wint_tot	.724	.752	1.000	.780
	spr_tot	.742	.740	.780	1.000
Sig. (1-tailed)	OAKSMathTot	.	.000	.000	.000
	fall_tot	.000	.	.000	.000
	wint_tot	.000	.000	.	.000
	spr_tot	.000	.000	.000	.
N	OAKSMathTot	1500	1500	1500	1500
	fall_tot	1500	1500	1500	1500
	wint_tot	1500	1500	1500	1500
	spr_tot	1500	1500	1500	1500

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.804[a]	.646	.645	5.787

a. Predictors: (Constant), spr_tot, fall_tot, wint_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	91446.803	3	30482.268	910.263	.000[a]
	Residual	50097.026	1496	33.487		
	Total	141543.829	1499			

a. Predictors: (Constant), spr_tot, fall_tot, wint_tot

b. Dependent Variable: OAKSMathTot

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	175.757	.861		204.242	.000					
	fall_tot	.489	.037	.333	13.248	.000	.738	.324	.204	.375	2.667
	wint_tot	.350	.042	.222	8.232	.000	.724	.208	.127	.324	3.084
	spr_tot	.496	.041	.322	12.180	.000	.742	.300	.187	.337	2.963

a. Dependent Variable: OAKSMathTot

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	fall_tot	wint_tot	spr_tot
1	1	3.957	1.000	.00	.00	.00	.00
	2	.025	12.644	.86	.15	.02	.01
	3	.011	19.410	.12	.85	.28	.19
	4	.007	23.049	.02	.00	.70	.80

a. Dependent Variable: OAKSMathTot

Fall Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.750[a]	.562	.562	6.538

a. Predictors: (Constant), fall_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	170702.497	1	170702.497	3993.611	.000[a]
	Residual	133104.479	3114	42.744		
	Total	303806.977	3115			

a. Predictors: (Constant), fall_tot

b. Dependent Variable: OAKSMathTot

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	185.688	.541		343.447	.000
	fall_tot	1.071	.017	.750	63.195	.000

a. Dependent Variable: OAKSMathTot

Winter Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.737[a]	.544	.544	6.707

a. Predictors: (Constant), wint_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	115216.346	1	115216.346	2561.194	.000[a]
	Residual	96673.645	2149	44.985		
	Total	211889.992	2150			

a. Predictors: (Constant), wint_tot

b. Dependent Variable: OAKSMathTot

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	182.075	.734		248.205	.000
	wint_tot	1.156	.023	.737	50.608	.000

a. Dependent Variable: OAKSMathTot

Spring Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.755[a]	.570	.570	6.536

a. Predictors: (Constant), spr_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	167867.435	1	167867.435	3929.959	.000[a]
	Residual	126563.984	2963	42.715		
	Total	294431.419	2964			

a. Predictors: (Constant), spr_tot

b. Dependent Variable: OAKSMathTot

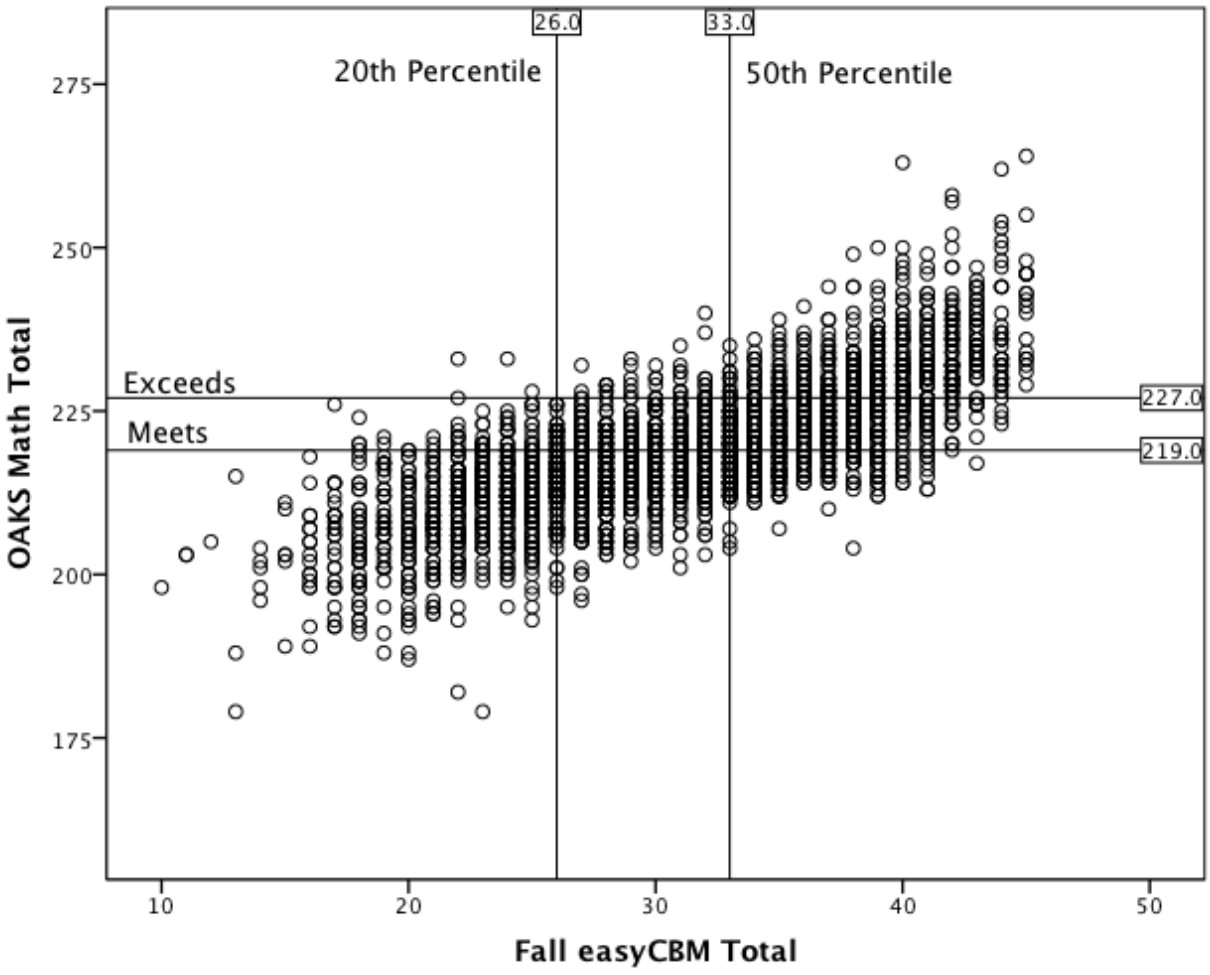
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	177.628	.667		266.185	.000
	spr_tot	1.177	.019	.755	62.689	.000

a. Dependent Variable: OAKSMathTot

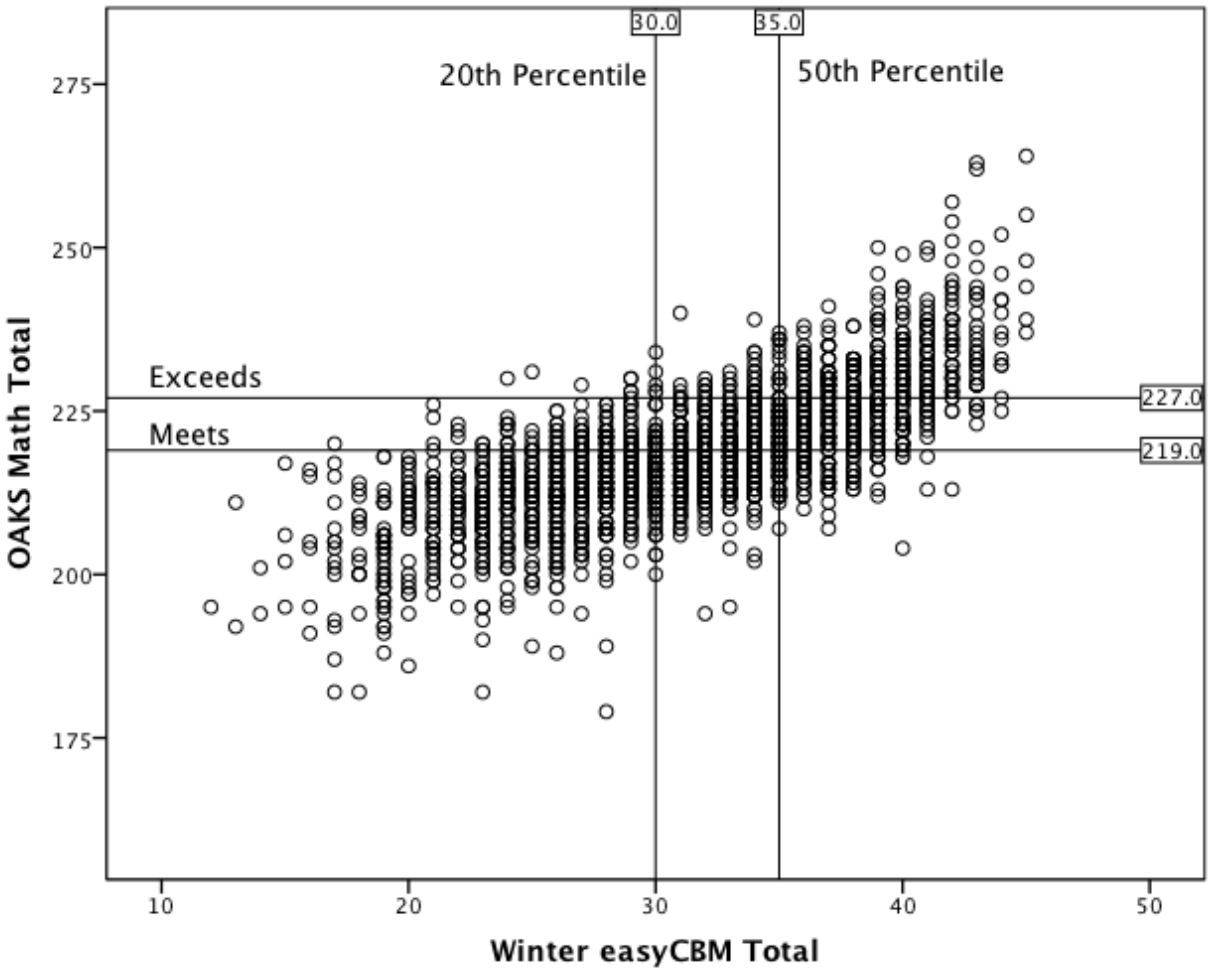
Scatterplot

Grade 4 Fall easyCBM® and OAKS



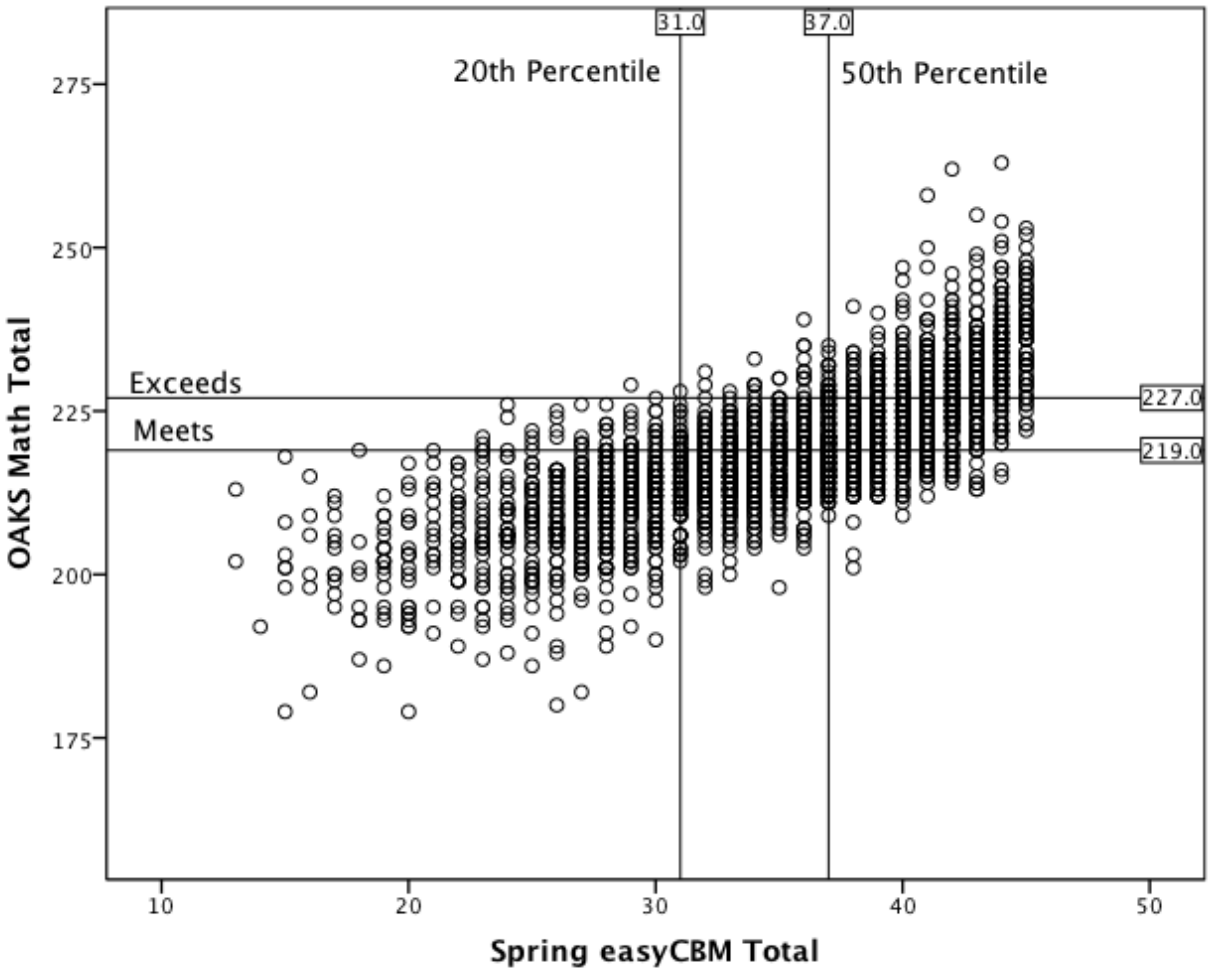
Scatterplot

Grade 4 Winter easyCBM® and OAKS



Scatterplot

Grade 4 Spring easyCBM® and OAKS



Grade 5

Full Model

Descriptive Statistics

	Mean	Std. Deviation	N
OAKS Best Math Score	225.08	9.803	1780
fall_tot	29.83	6.732	1780
wint_tot	32.88	7.137	1780
spr_tot	36.78	7.127	1780

Correlations

		OAKS Best Math Score	fall_tot	wint_tot	spr_tot
Pearson Correlation	OAKS Best Math Score	1.000	.755	.742	.726
	fall_tot	.755	1.000	.765	.706
	wint_tot	.742	.765	1.000	.769
	spr_tot	.726	.706	.769	1.000
Sig. (1-tailed)	OAKS Best Math Score	.	.000	.000	.000
	fall_tot	.000	.	.000	.000
	wint_tot	.000	.000	.	.000
	spr_tot	.000	.000	.000	.
N	OAKS Best Math Score	1780	1780	1780	1780
	fall_tot	1780	1780	1780	1780
	wint_tot	1780	1780	1780	1780
	spr_tot	1780	1780	1780	1780

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.814[a]	.663	.662	5.699

a. Predictors: (Constant), spr_tot, fall_tot, wint_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	113296.216	3	37765.405	1162.933	.000[a]
	Residual	57674.312	1776	32.474		
	Total	170970.528	1779			

a. Predictors: (Constant), spr_tot, fall_tot, wint_tot

b. Dependent Variable: OAKS Best Math Score

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	183.924	.729		252.179	.000					
	fall_tot	.544	.033	.374	16.727	.000	.755	.369	.231	.381	2.626
	wint_tot	.336	.034	.245	9.890	.000	.742	.228	.136	.310	3.226
	spr_tot	.377	.031	.274	12.187	.000	.726	.278	.168	.375	2.666

a. Dependent Variable: OAKS Best Math Score

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	fall_tot	wint_tot	spr_tot
1	1	3.951	1.000	.00	.00	.00	.00
	2	.028	11.856	.87	.11	.06	.00
	3	.012	17.860	.07	.82	.13	.34
	4	.009	21.058	.06	.07	.81	.66

a. Dependent Variable: OAKS Best Math Score

Fall Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.754[a]	.569	.569	6.341

a. Predictors: (Constant), fall_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	177839.428	1	177839.428	4422.506	.000[a]
	Residual	134832.049	3353	40.212		
	Total	312671.477	3354			

a. Predictors: (Constant), fall_tot

b. Dependent Variable: OAKS Best Math Score

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	192.844	.498		387.409	.000
	fall_tot	1.063	.016	.754	66.502	.000

a. Dependent Variable: OAKS Best Math Score

Winter Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.738[a]	.544	.544	6.491

a. Predictors: (Constant), wint_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	113818.119	1	113818.119	2701.109	.000[a]
	Residual	95230.870	2260	42.138		
	Total	209048.989	2261			

a. Predictors: (Constant), wint_tot

b. Dependent Variable: OAKS Best Math Score

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	192.425	.632		304.576	.000
	wint_tot	.987	.019	.738	51.972	.000

a. Dependent Variable: OAKS Best Math Score

Spring Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.723[a]	.523	.523	6.764

a. Predictors: (Constant), spr_tot

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	158293.701	1	158293.701	3459.590	.000[a]
	Residual	144540.198	3159	45.755		
	Total	302833.899	3160			

a. Predictors: (Constant), spr_tot

b. Dependent Variable: OAKS Best Math Score

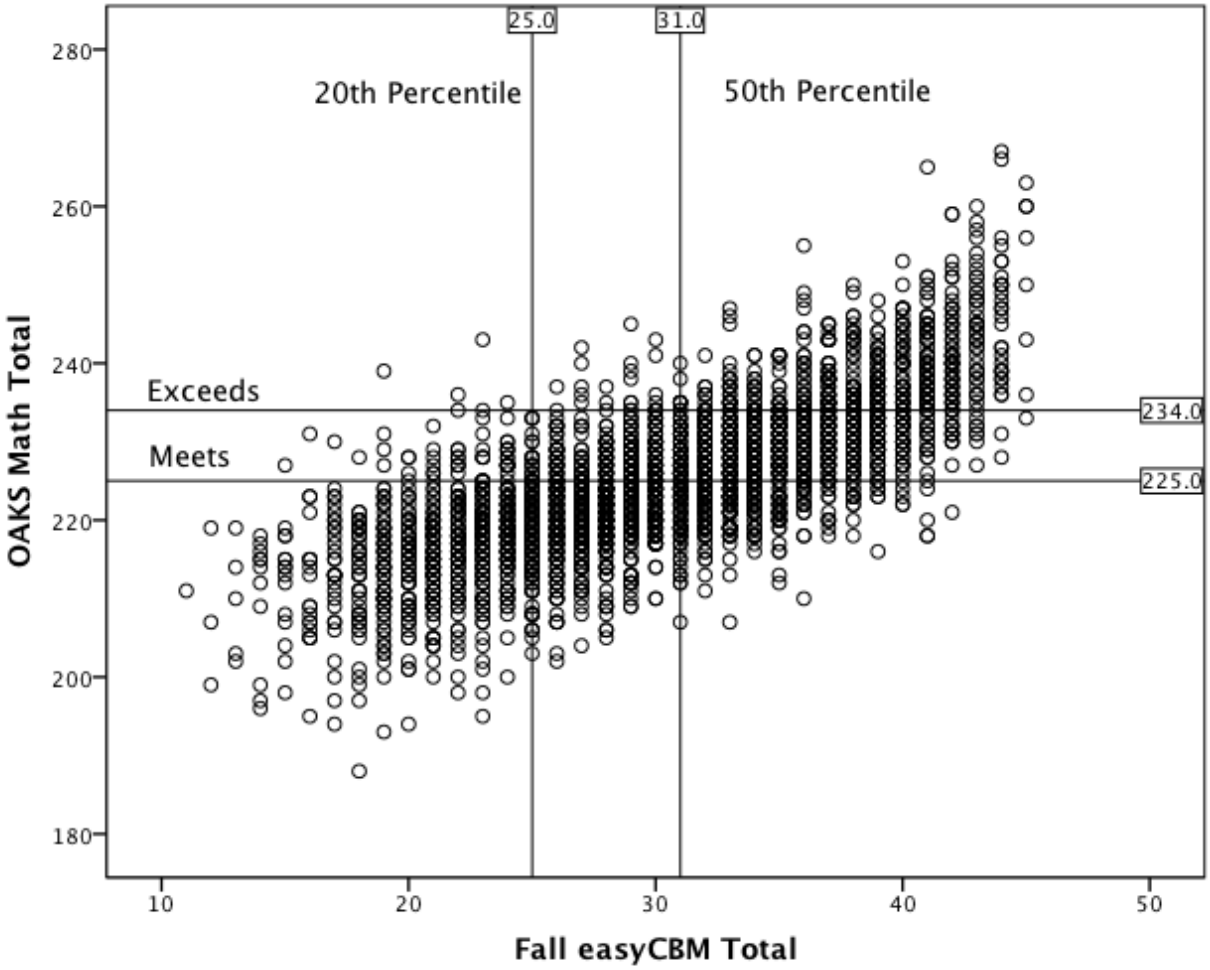
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	187.105	.660		283.615	.000
	spr_tot	1.021	.017	.723	58.818	.000

a. Dependent Variable: OAKS Best Math Score

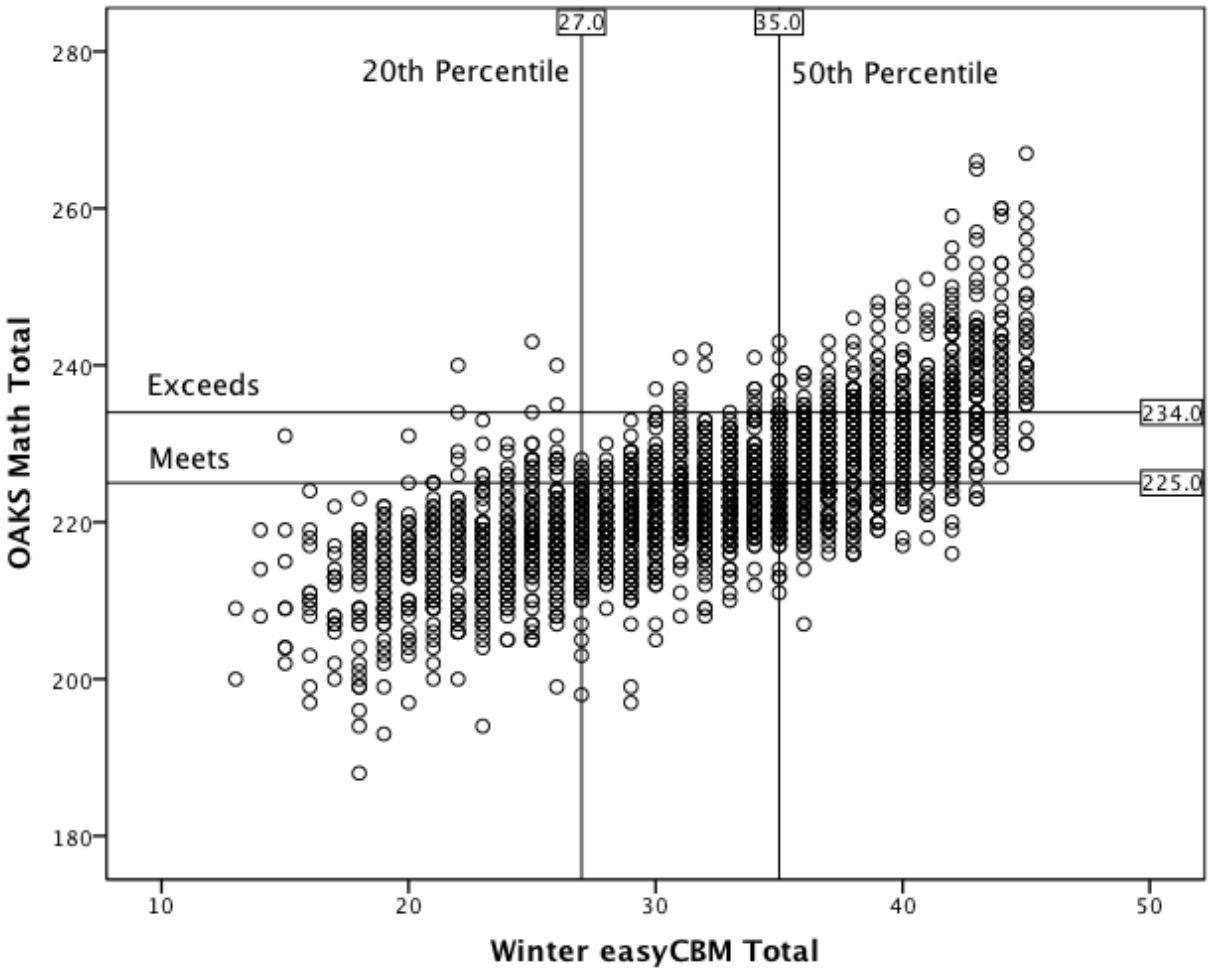
Scatterplot

Grade 5 - Fall easyCBM® and OAKS



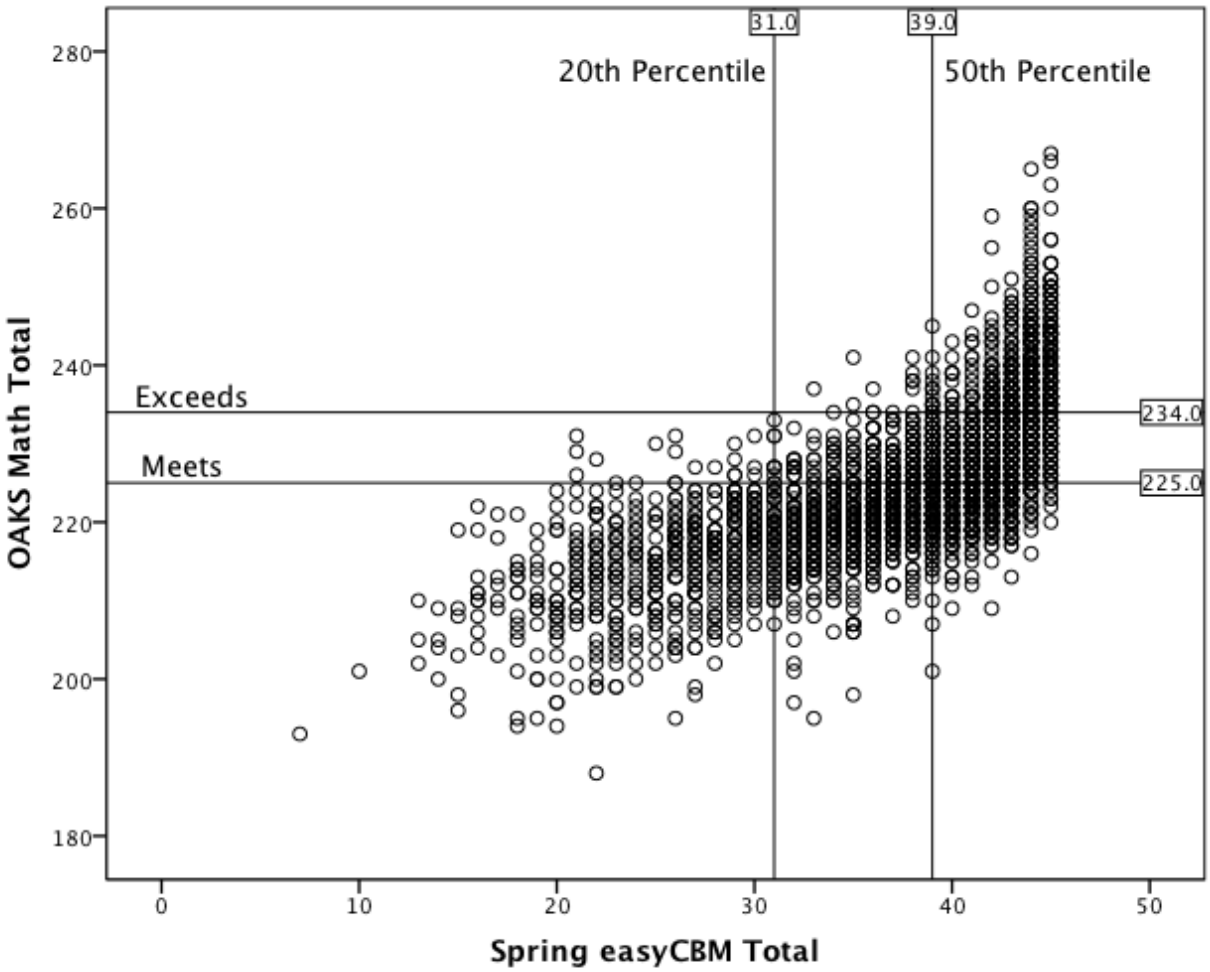
Scatterplot

Grade 5 - Winter easyCBM® and OAKS



Scatterplot

Grade 5 - Spring easyCBM® and OAKS



Grade 6

Full Model

Descriptive Statistics

	Mean	Std. Deviation	N
OAKSMathTot	227.21	9.939	1280
Fall09TotMath	29.24	6.775	1280
Wint10TotMath	29.90	6.976	1280
Spr10TotMath	33.12	7.767	1280

Correlations

		OAKSMathTot	Fall09TotMath	Wint10TotMath	Spr10TotMath
Pearson Correlation	OAKSMathTot	1.000	.798	.804	.815
	Fall09TotMath	.798	1.000	.784	.786
	Wint10TotMath	.804	.784	1.000	.806
	Spr10TotMath	.815	.786	.806	1.000
Sig. (1-tailed)	OAKSMathTot	.	.000	.000	.000
	Fall09TotMath	.000	.	.000	.000
	Wint10TotMath	.000	.000	.	.000
	Spr10TotMath	.000	.000	.000	.
N	OAKSMathTot	1280	1280	1280	1280
	Fall09TotMath	1280	1280	1280	1280
	Wint10TotMath	1280	1280	1280	1280
	Spr10TotMath	1280	1280	1280	1280

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.868[a]	.754	.753	4.936

a. Predictors: (Constant), Spr10TotMath, Fall09TotMath, Wint10TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	95259.094	3	31753.031	1303.529	.000[a]
	Residual	31082.456	1276	24.359		
	Total	126341.550	1279			

a. Predictors: (Constant), Spr10TotMath, Fall09TotMath, Wint10TotMath

b. Dependent Variable: OAKSMathTot

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	187.359	.653		287.063	.000					
	Fall09TotMath	.434	.036	.296	12.019	.000	.798	.319	.167	.318	3.145
	Wint10TotMath	.417	.037	.293	11.355	.000	.804	.303	.158	.290	3.443
	Spr10TotMath	.444	.033	.347	13.411	.000	.815	.351	.186	.289	3.466

a. Dependent Variable: OAKSMathTot

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Fall09TotMath	Wint10TotMath	Spr10TotMath
1	1	3.945	1.000	.00	.00	.00	.00
	2	.034	10.807	1.00	.03	.04	.04
	3	.011	18.616	.00	.96	.22	.20
	4	.010	19.830	.00	.00	.74	.76

a. Dependent Variable: OAKSMathTot

Fall Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792[a]	.627	.627	5.943

a. Predictors: (Constant), Fall09TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	192689.824	1	192689.824	5455.138	.000[a]
	Residual	114763.235	3249	35.323		
	Total	307453.059	3250			

a. Predictors: (Constant), Fall09TotMath

b. Dependent Variable: OAKSMathTot

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	194.785	.454		428.735	.000
	Fall09TotMath	1.093	.015	.792	73.859	.000

a. Dependent Variable: OAKSMathTot

Winter Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.800[a]	.640	.640	5.920

a. Predictors: (Constant), Wint10TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	117353.752	1	117353.752	3349.033	.000[a]
	Residual	66052.446	1885	35.041		
	Total	183406.198	1886			

a. Predictors: (Constant), Wint10TotMath

b. Dependent Variable: OAKSMathTot

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	193.947	.583		332.793	.000
	Wint10TotMath	1.112	.019	.800	57.871	.000

a. Dependent Variable: OAKSMathTot

Spring Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.798[a]	.636	.636	5.749

a. Predictors: (Constant), Spr10TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	121060.050	1	121060.050	3663.064	.000[a]
	Residual	69270.390	2096	33.049		
	Total	190330.440	2097			

a. Predictors: (Constant), Spr10TotMath

b. Dependent Variable: OAKSMathTot

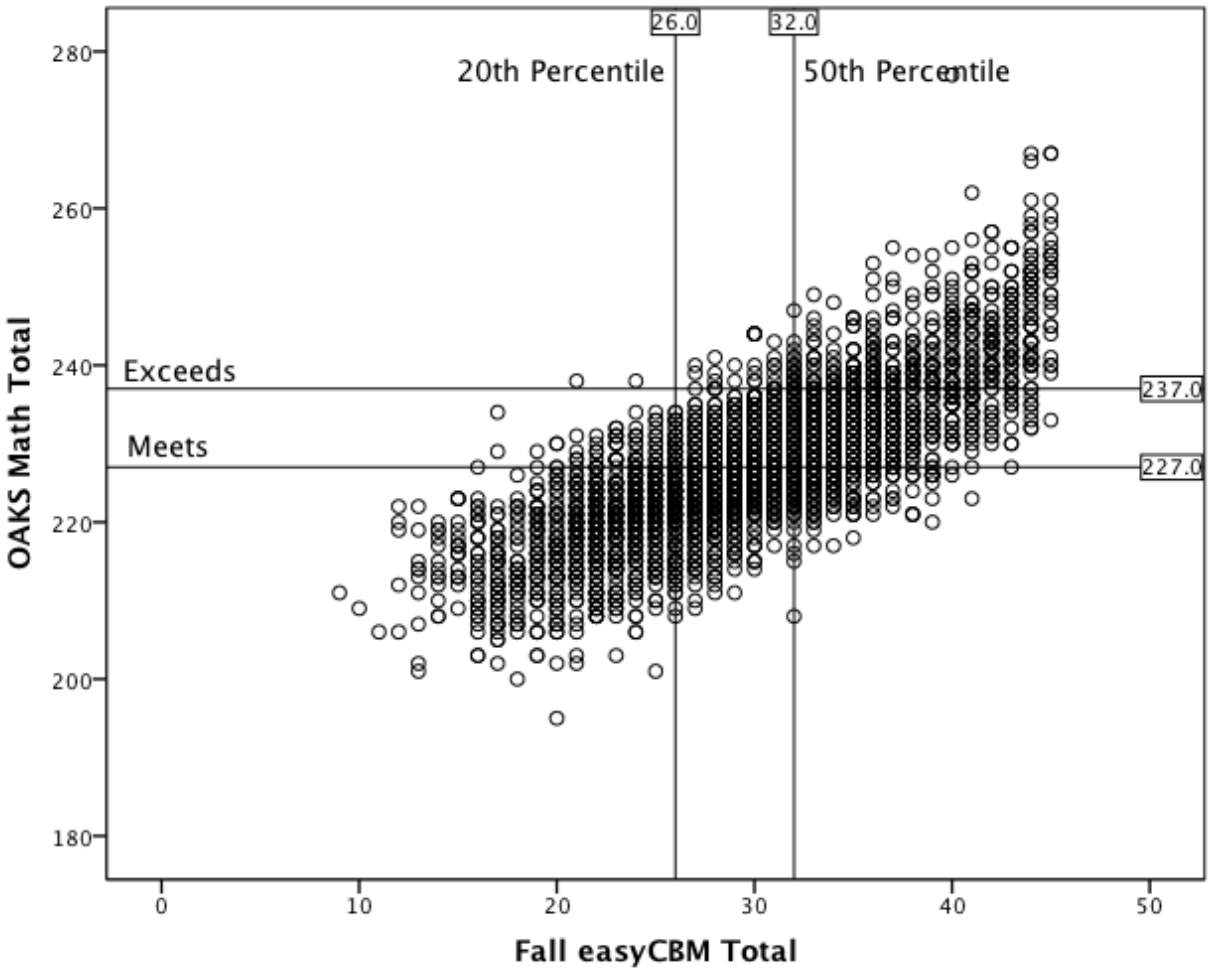
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	194.659	.550		354.099	.000
	Spr10TotMath	.979	.016	.798	60.523	.000

a. Dependent Variable: OAKSMathTot

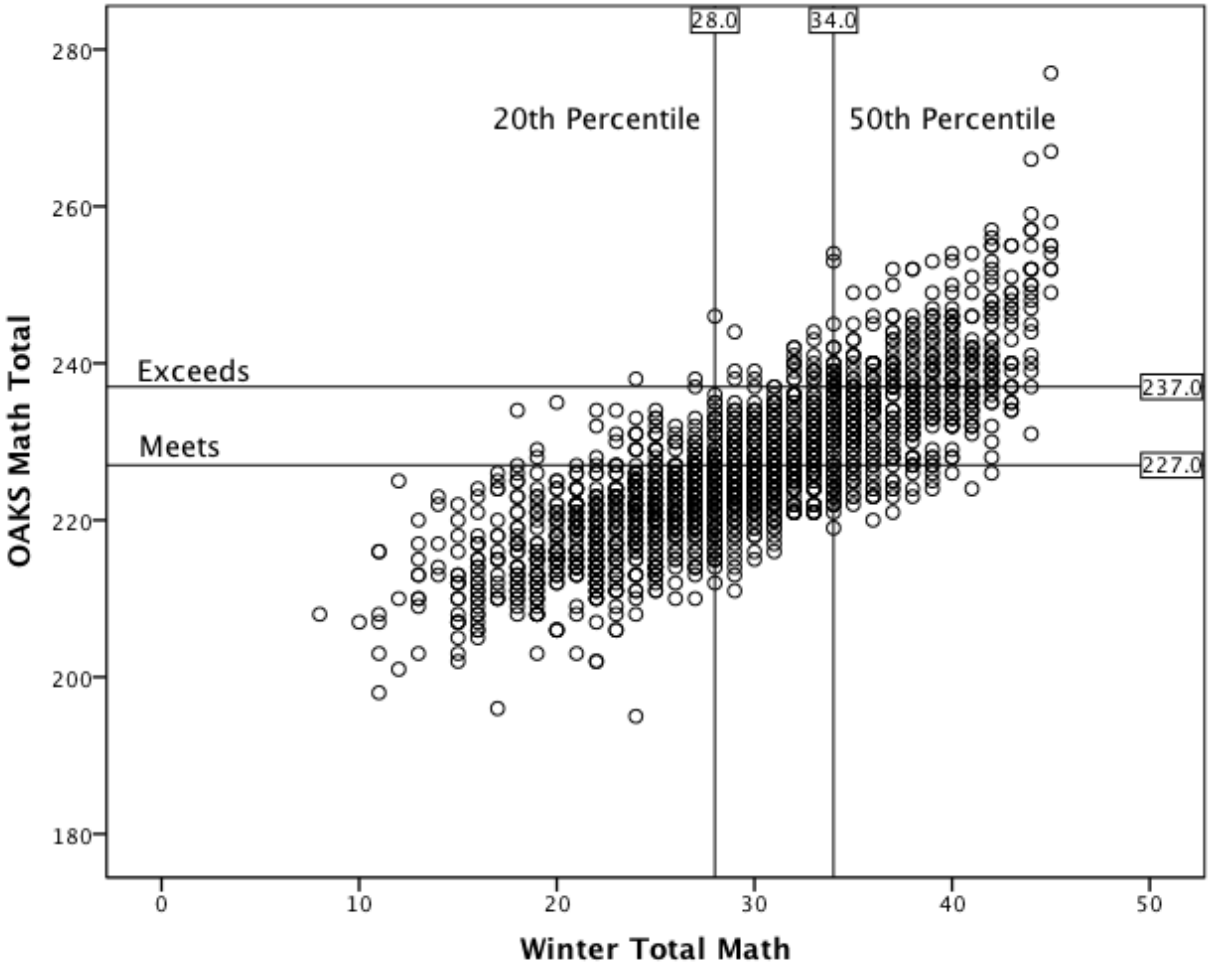
Scatterplot

Grade 6 - Fall easyCBM® and OAKS



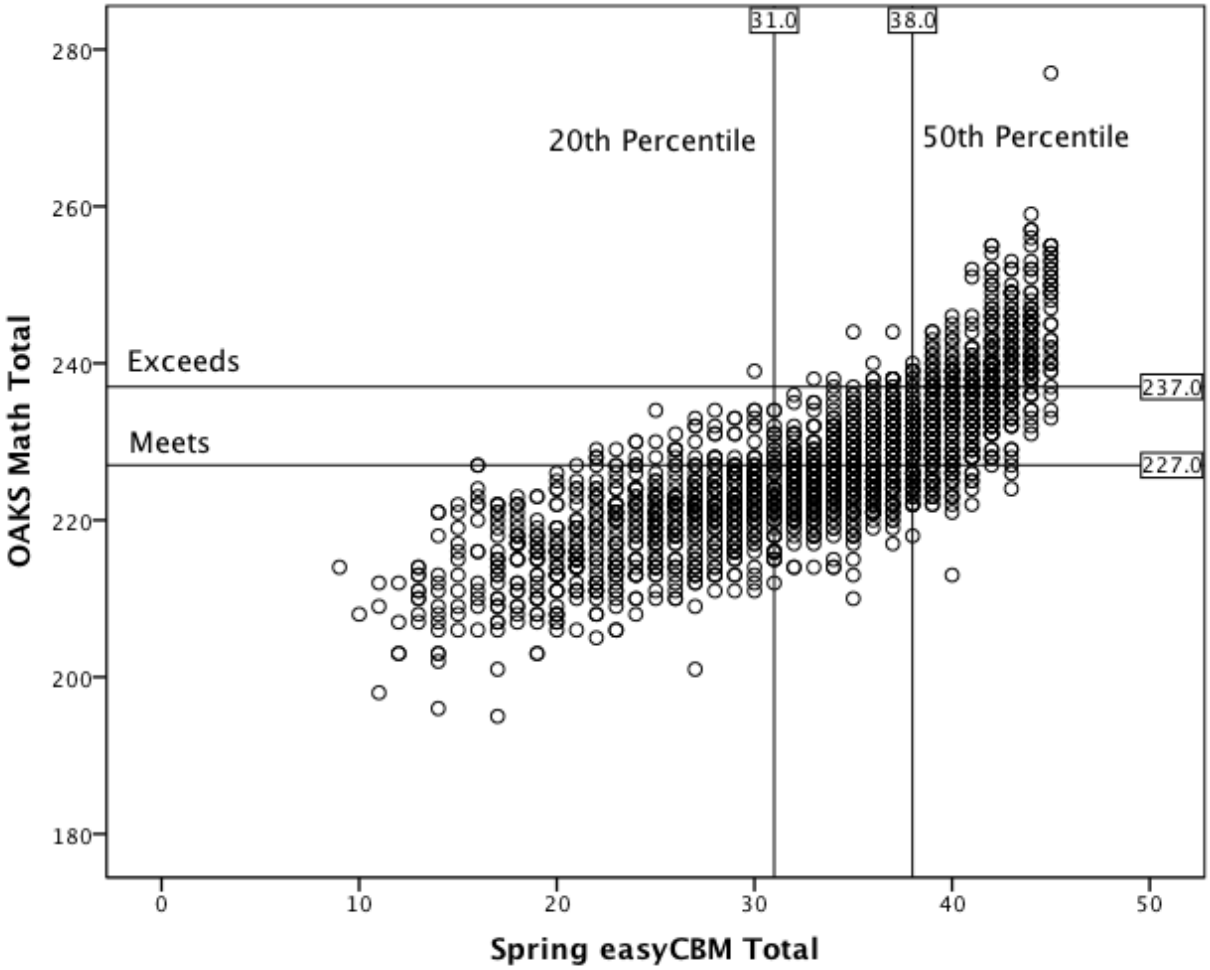
Scatterplot

Grade 6 - Winter easyCBM® and OAKS



Scatterplot

Grade 6 - Spring easyCBM® and OAKS



Grade 7

Full Model

Descriptive Statistics

	Mean	Std. Deviation	N
OAKS Best Math Score	233.07	8.922	1337
Fall09TotMath	28.47	7.613	1337
Wint10TotMath	28.78	7.697	1337
Spr10TotMath	30.55	7.969	1337

Correlations

		OAKS Best Math Score	Fall09TotMath	Wint10TotMath	Spr10TotMath
Pearson Correlation	OAKS Best Math Score	1.000	.806	.811	.817
	Fall09TotMath	.806	1.000	.813	.810
	Wint10TotMath	.811	.813	1.000	.821
	Spr10TotMath	.817	.810	.821	1.000
Sig. (1-tailed)	OAKS Best Math Score	.	.000	.000	.000
	Fall09TotMath	.000	.	.000	.000
	Wint10TotMath	.000	.000	.	.000
	Spr10TotMath	.000	.000	.000	.
N	OAKS Best Math Score	1337	1337	1337	1337
	Fall09TotMath	1337	1337	1337	1337
	Wint10TotMath	1337	1337	1337	1337
	Spr10TotMath	1337	1337	1337	1337

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.867[a]	.752	.751	4.452

a. Predictors: (Constant), Spr10TotMath, Fall09TotMath, Wint10TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	79922.931	3	26640.977	1343.966	.000[a]
	Residual	26423.600	1333	19.823		
	Total	106346.531	1336			

a. Predictors: (Constant), Spr10TotMath, Fall09TotMath, Wint10TotMath

b. Dependent Variable: OAKS Best Math Score

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	201.899	.506		399.025	.000					
	Fall09TotMath	.344	.030	.293	11.308	.000	.806	.296	.154	.277	3.608
	Wint10TotMath	.346	.031	.298	11.187	.000	.811	.293	.153	.262	3.811
	Spr10TotMath	.374	.030	.334	12.619	.000	.817	.327	.172	.265	3.768

a. Dependent Variable: OAKS Best Math Score

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Fall09TotMath	Wint10TotMath	Spr10TotMath
1	1	3.932	1.000	.00	.00	.00	.00
	2	.044	9.458	.99	.04	.04	.03
	3	.013	17.588	.00	.96	.29	.17
	4	.012	18.390	.00	.00	.67	.80

a. Dependent Variable: OAKS Best Math Score

Fall Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.802[a]	.643	.643	5.608

a. Predictors: (Constant), Fall09TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	172841.062	1	172841.062	5495.955	.000[a]
	Residual	96076.020	3055	31.449		
	Total	268917.082	3056			

a. Predictors: (Constant), Fall09TotMath

b. Dependent Variable: OAKS Best Math Score

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	206.295	.382		539.461	.000
	Fall09TotMath	.930	.013	.802	74.135	.000

a. Dependent Variable: OAKS Best Math Score

Winter Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.823[a]	.678	.678	5.240

a. Predictors: (Constant), Wint10TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	95418.033	1	95418.033	3475.072	.000[a]
	Residual	45305.471	1650	27.458		
	Total	140723.504	1651			

a. Predictors: (Constant), Wint10TotMath

b. Dependent Variable: OAKS Best Math Score

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	205.200	.481		426.197	.000
	Wint10TotMath	.962	.016	.823	58.950	.000

a. Dependent Variable: OAKS Best Math Score

Spring Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.816[a]	.665	.665	5.302

a. Predictors: (Constant), Spr10TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	102949.015	1	102949.015	3661.863	.000[a]
	Residual	51841.915	1844	28.114		
	Total	154790.930	1845			

a. Predictors: (Constant), Spr10TotMath

b. Dependent Variable: OAKS Best Math Score

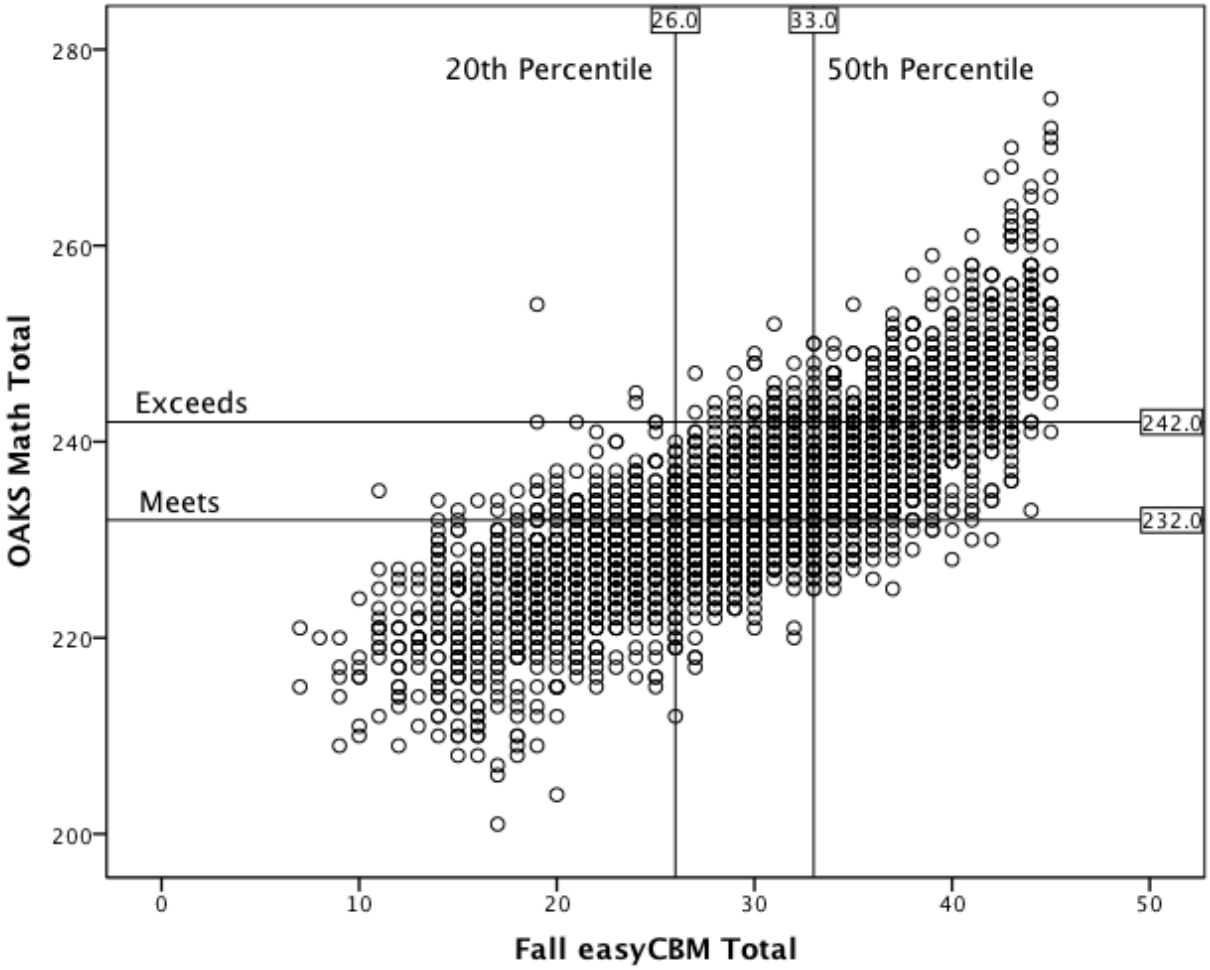
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	205.009	.472		434.177	.000
	Spr10TotMath	.904	.015	.816	60.513	.000

a. Dependent Variable: OAKS Best Math Score

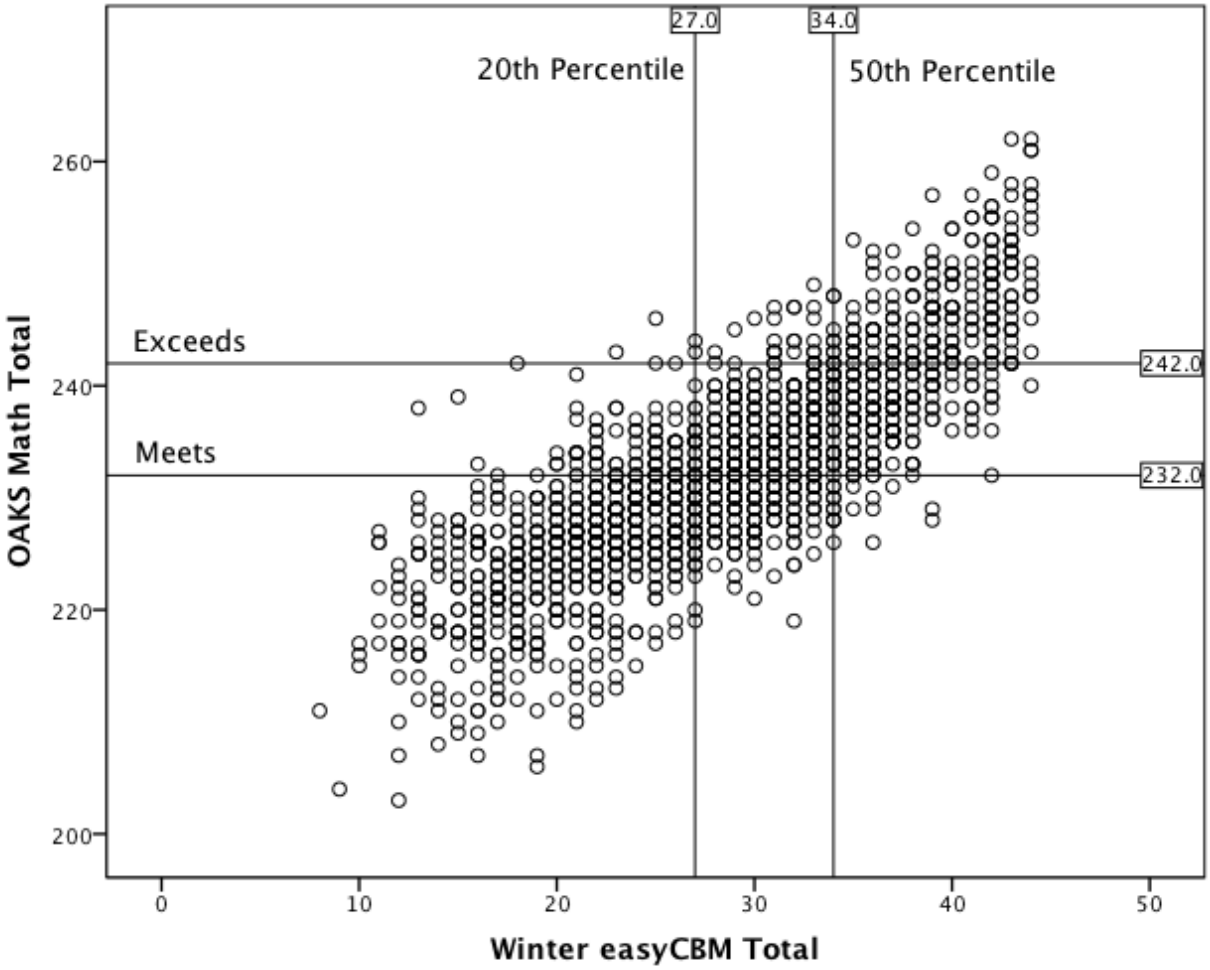
Scatterplot

Grade 7 - Fall easyCBM® and OAKS



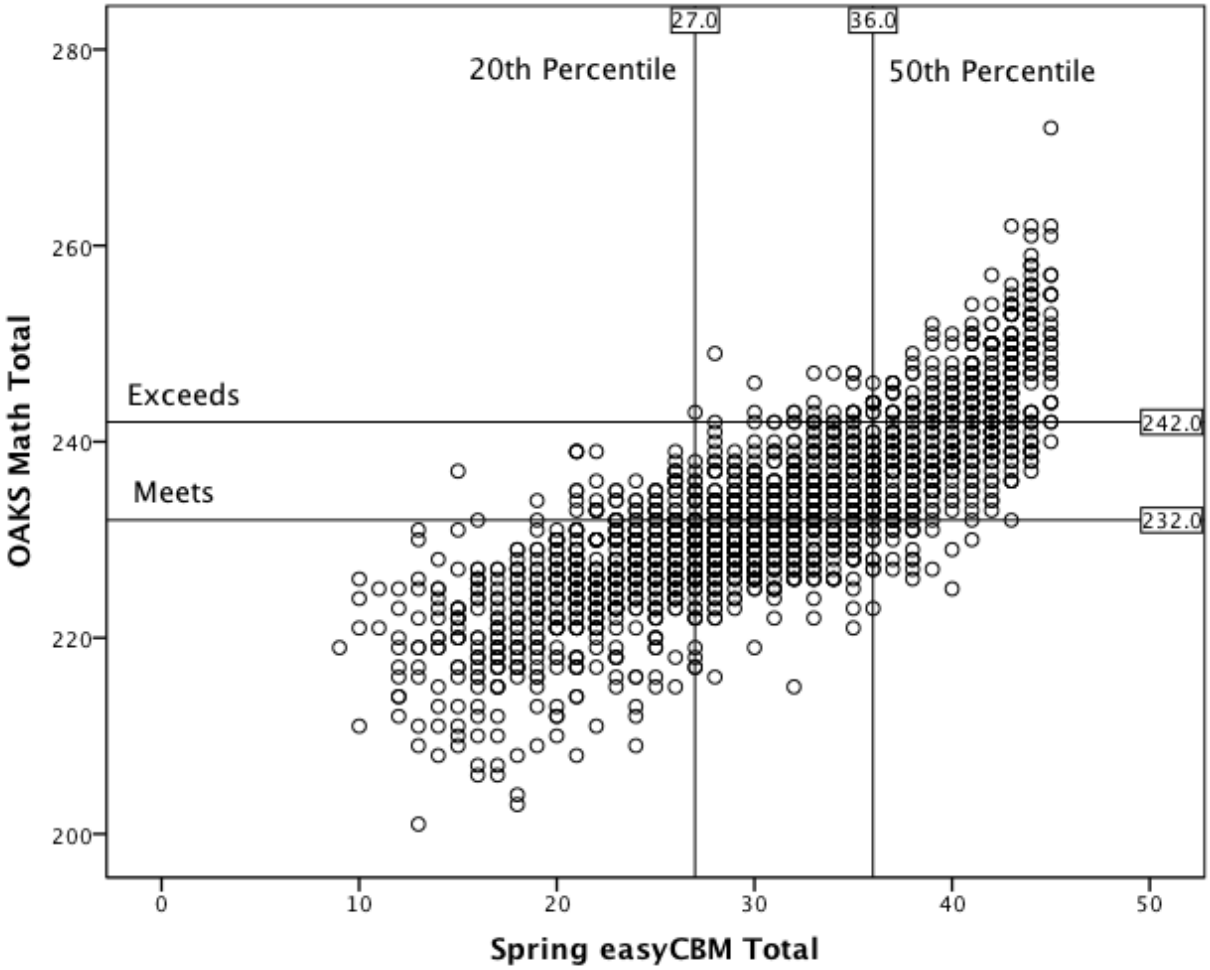
Scatterplot

Grade 7 - Winter easyCBM® and OAKS



Scatterplot

Grade 7 - Spring easyCBM® and OAKS



Grade 8

Full Model

Descriptive Statistics

	Mean	Std. Deviation	N
OAKS Best Math Score	234.58	10.333	1291
Fall09TotMath	28.24	7.894	1291
Wint10TotMath	28.53	8.420	1291
Spr10TotMath	29.18	8.325	1291

Correlations

		OAKS Best Math Score	Fall09TotMath	Wint10TotMath	Spr10TotMath
Pearson Correlation	OAKS Best Math Score	1.000	.810	.801	.804
	Fall09TotMath	.810	1.000	.800	.786
	Wint10TotMath	.801	.800	1.000	.807
	Spr10TotMath	.804	.786	.807	1.000
Sig. (1-tailed)	OAKS Best Math Score	.	.000	.000	.000
	Fall09TotMath	.000	.	.000	.000
	Wint10TotMath	.000	.000	.	.000
	Spr10TotMath	.000	.000	.000	.
N	OAKS Best Math Score	1291	1291	1291	1291
	Fall09TotMath	1291	1291	1291	1291
	Wint10TotMath	1291	1291	1291	1291
	Spr10TotMath	1291	1291	1291	1291

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.866[a]	.750	.750	5.170

a. Predictors: (Constant), Spr10TotMath, Fall09TotMath, Wint10TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	103347.456	3	34449.152	1288.889	.000[a]
	Residual	34398.673	1287	26.728		
	Total	137746.129	1290			

a. Predictors: (Constant), Spr10TotMath, Fall09TotMath, Wint10TotMath

b. Dependent Variable: OAKS Best Math Score

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	200.917	.561		357.949	.000					
	Fall09TotMath	.456	.033	.349	13.785	.000	.810	.359	.192	.303	3.296
	Wint10TotMath	.331	.032	.270	10.187	.000	.801	.273	.142	.277	3.612
	Spr10TotMath	.388	.032	.313	12.195	.000	.804	.322	.170	.295	3.394

a. Dependent Variable: OAKS Best Math Score

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Fall09TotMath	Wint10TotMath	Spr10TotMath
1	1	3.919	1.000	.00	.00	.00	.00
	2	.050	8.814	.98	.02	.05	.03
	3	.016	15.743	.00	.78	.01	.61
	4	.015	16.281	.01	.19	.94	.36

a. Dependent Variable: OAKS Best Math Score

Fall Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.808[a]	.653	.652	6.335

a. Predictors: (Constant), Fall09TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	232323.561	1	232323.561	5789.725	.000[a]
	Residual	123711.158	3083	40.127		
	Total	356034.718	3084			

a. Predictors: (Constant), Fall09TotMath

b. Dependent Variable: OAKS Best Math Score

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	205.040	.416		492.405	.000
	Fall09TotMath	1.065	.014	.808	76.090	.000

a. Dependent Variable: OAKS Best Math Score

Winter Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.807[a]	.651	.651	6.367

a. Predictors: (Constant), Wint10TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	122274.772	1	122274.772	3016.270	.000[a]
	Residual	65469.518	1615	40.538		
	Total	187744.289	1616			

a. Predictors: (Constant), Wint10TotMath

b. Dependent Variable: OAKS Best Math Score

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	205.476	.548		374.884	.000
	Wint10TotMath	1.018	.019	.807	54.921	.000

a. Dependent Variable: OAKS Best Math Score

Spring Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.803[a]	.644	.644	6.052

a. Predictors: (Constant), Spr10TotMath

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	114386.162	1	114386.162	3122.775	.000[a]
	Residual	63149.530	1724	36.630		
	Total	177535.692	1725			

a. Predictors: (Constant), Spr10TotMath

b. Dependent Variable: OAKS Best Math Score

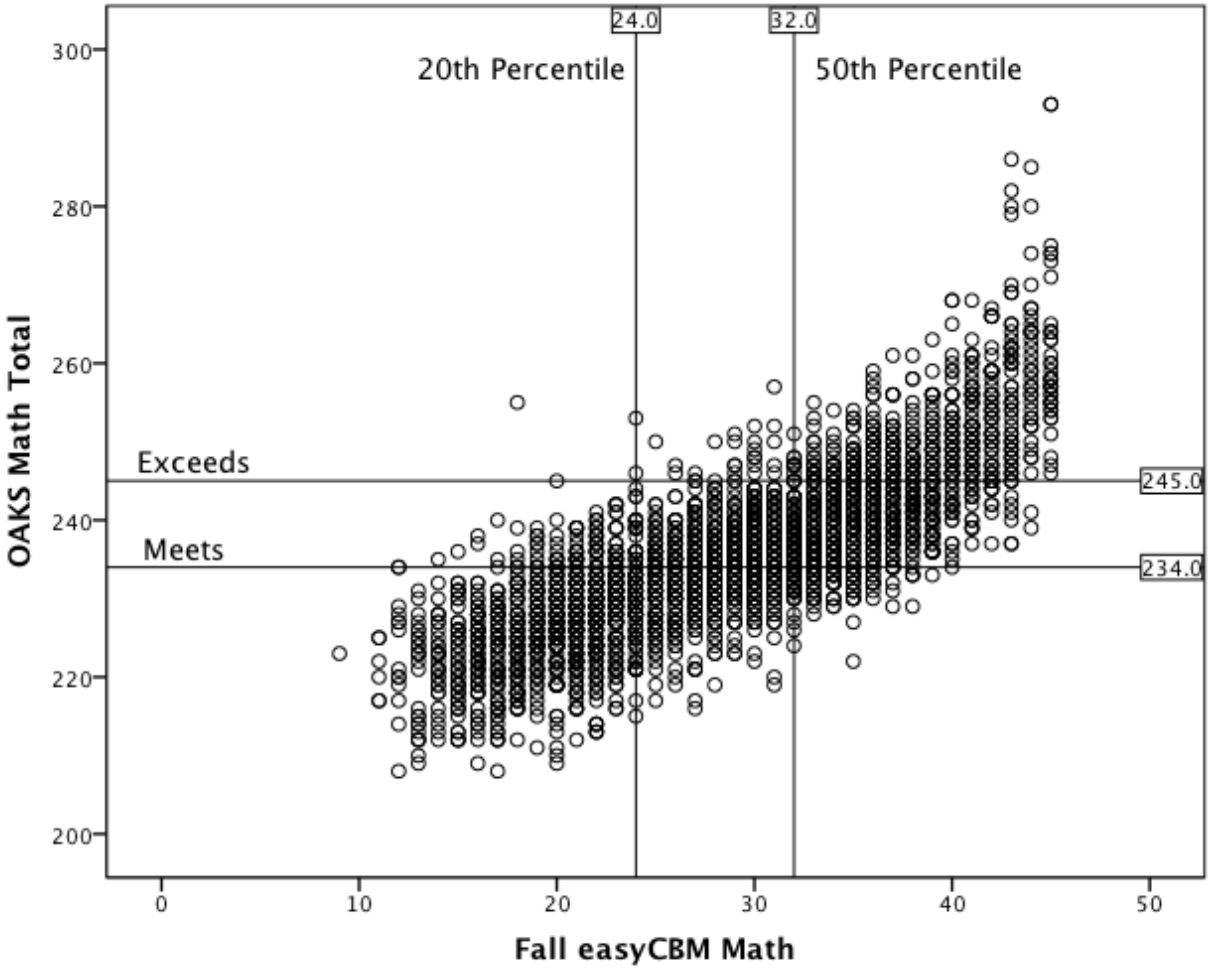
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	205.322	.531		386.393	.000
	Spr10TotMath	.990	.018	.803	55.882	.000

a. Dependent Variable: OAKS Best Math Score

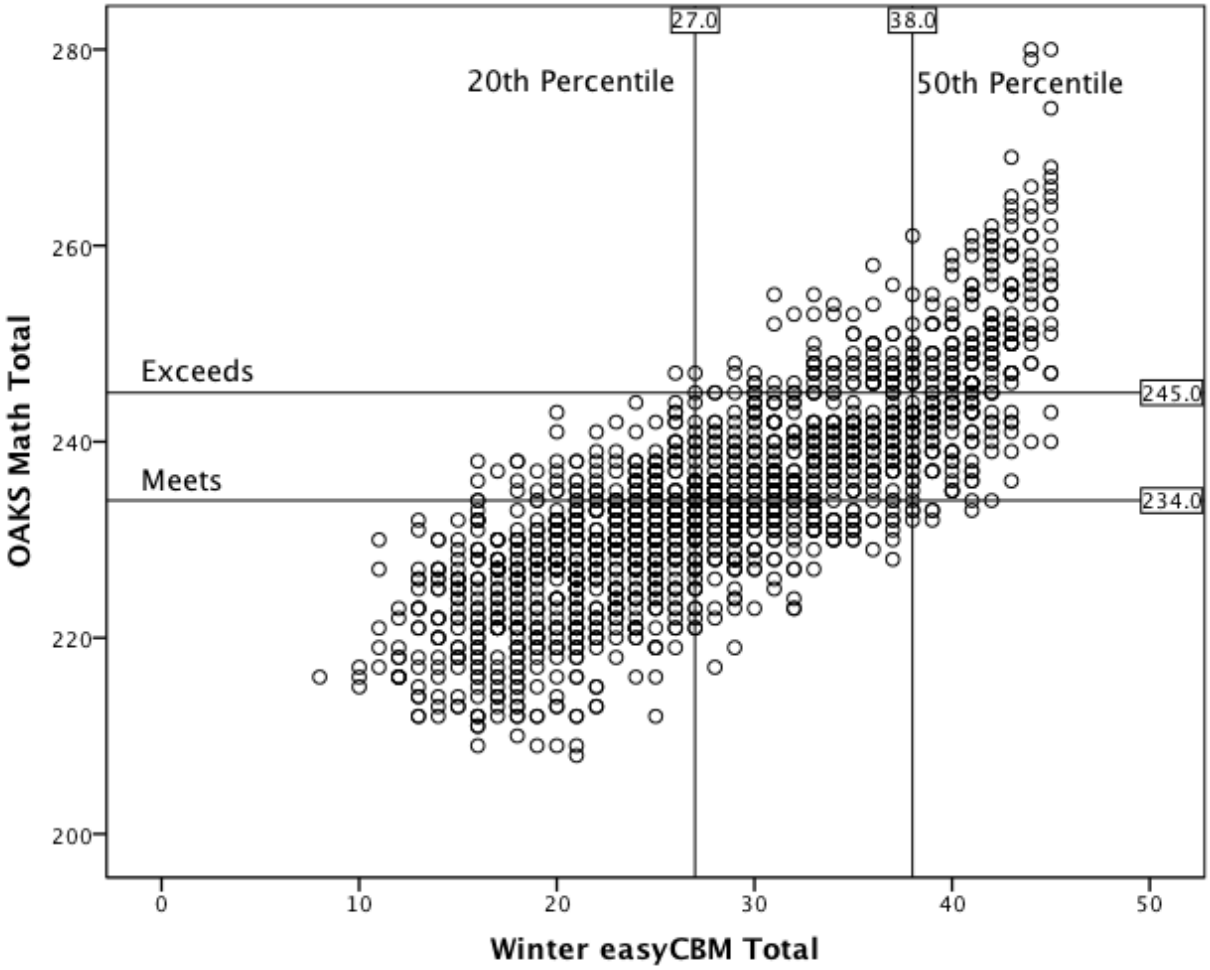
Scatterplot

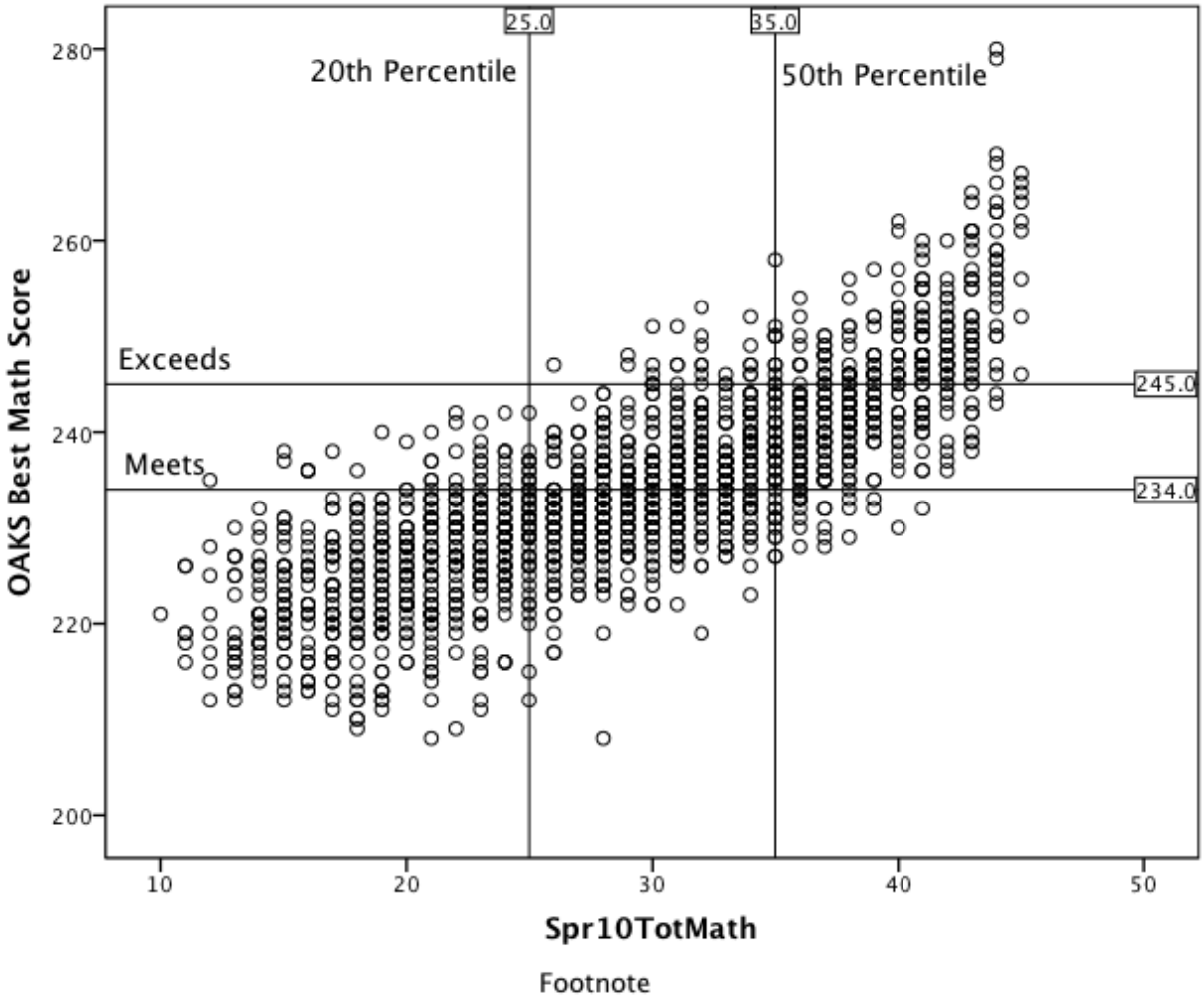
Grade 8 - Fall easyCBM® and OAKS



Scatterplot

Grade 8 - Winter easyCBM® and OAKS



Scatterplot

Grade 8 - Winter easyCBM® and OAKS