OHIO ACHIEVEMENT ASSESSMENTS MAY 2013 ADMINISTRATION

STATISTICAL SUMMARY

This document provides a summary of information from the May 2013 administration of the Ohio Achievement Assessments (OAA) to students in grades three through eight. The statistics shown are computed from the entire population of Ohio public school students, including community school students, for each subject and grade tested. Tables 1-3 summarize parameters computed from the data. Tables 4-6 show the percent of students at each performance level for each grade and test. Tables 7 and 8 present the raw and scaled score cut points for each test. Subscale passing bands are shown in Tables 9-11. Tables 12-14 show the conversions of raw scores to scaled scores.

Table 1 - Summary of Parameters from the May 2013 Administration of the Ohio Achievement Assessments for Grades 3 and 4.

	Gra	de 3	Grade 4		
Parameter	Reading	Math	Reading	Math	Writing
Students Tested	124,204	126,821	126,929	126,605	
Max Raw Score	49	52	49	52	
Max Scaled Score	509	521	534	551	
Min Scaled Score	259	240	263	239	
Raw Score Mean	36.79	37.01	32.98	32.21	
Raw Score Std. Deviation	7.70	9.23	7.98	10.36	Not Tested in
Raw Score SEM	2.89	3.27	3.23	3.32	2013.
Scaled Score Mean	420.88	421.04	428.19	425.23	
Scaled Score Std. Deviation	26.46	30.20	24.51	35.48	
Scaled Score SEM	9.92	10.72	9.91	11.36	
Reliability	0.86	0.87	0.84	0.90	

Note: SEM is the Standard Error of Measurement. Reliability is estimated using Cronbach Alpha.

The Grade 3 Reading test is administered in fall and spring. The data in Table 1 include only students who were tested in the spring, so the figures for Grade 3 Reading do not include some students who achieved a Proficient (or above) score on the fall test and did not retake the test during the spring administration. The Writing (grades 4 and 7) and Social Studies (grades 5 and 8) tests were suspended after the 2009 administration, so no data are available for these tests.

Table 2 - Summary of Parameters from the May 2013 Administration of the Ohio Achievement Assessments for Grades 5 and 6.

		Gra	ade 5		Grade 6	
Parameter	Reading	Math	Science	Social Studies	Reading	Math
Students Tested	127,975	127,427	128,078		130,906	130,288
Max Raw Score	49	52	48		49	50
Max Scaled Score	534	548	565		559	575
Min Scaled Score	247	245	239		267	235
Raw Score Mean	30.05	30.69	28.47		27.34	28.78
Raw Score Std. Deviation	8.80	11.65	8.88	Not Tested in	8.98	11.24
Raw Score SEM	3.25	3.46	3.06	2013.	3.40	3.53
Scaled Score Mean	414.85	416.48	414.34		425.34	428.96
Scaled Score Std. Deviation	29.03	38.29	34.46		26.54	42.43
Scaled Score SEM	10.71	11.37	11.89		10.04	13.26
Reliability	0.86	0.91	0.88		0.86	0.90

Table 3 – Summary of Parameters from the May 2013 Administration of the Ohio Achievement Assessments for Grades 7 and 8.

		Grade 7		Grade 8			
Parameter	Reading	Math	Writing	Reading	Math	Science	Social Studies
Students Tested	132,049	131,287		131,050	130,466	130,979	
Max Raw Score	47	50		48	46	48	
Max Scaled Score	533	574		538	537	558	
Min Scaled Score	271	268		261	288	257	
Raw Score Mean	28.92	24.51		32.85	24.47	26.56	
Raw Score Std. Deviation	8.70	10.39	Not Tested in	8.68	10.02	9.56	Not Tested in
Raw Score SEM	3.23	3.20	2013.	3.12	3.14	3.33	2013.
Scaled Score Mean	422.16	422.20		431.18	422.84	413.07	
Scaled Score Std. Deviation	26.35	34.86		29.48	31.01	31.45	
Scaled Score SEM	9.76	10.73		10.61	9.71	10.96	
Reliability	0.86	0.91		0.87	0.90	0.88	

Table 4 - Percent of Students at Each Performance Level for Grades 3 and 4, May 2013 OAA Administration.

	Gra	de 3	Grade 4			
	Reading Math		Reading	Writing		
Level	Percent	Percent	Percent	Percent	Percent	
Advanced	38.31	19.46	4.18	24.95		
Accelerated	26.43	23.09	40.91	21.04	Not	
Proficient	16.24	36.35	43.21	32.07	Tested	
Basic	10.78	13.72	6.01	13.10	in 2013.	
Limited	8.25	7.39	5.69	8.84		

Table 5 - Percent of Students at Each Performance Level for Grades 5 and 6, May 2013 OAA Administration.

		Gra		Grade 6		
	Reading	Math Science Social Studies		Reading	Math	
Level	Percent	Percent	Percent	Percent	Percent	Percent
Advanced	7.18	27.22	16.75		13.93	32.72
Accelerated	10.33	14.63	32.69	Not	22.98	16.83
Proficient	56.93	26.84	18.55	Tested in	46.51	25.86
Basic	11.64	13.26	25.60	2013.	12.09	13.46
Limited	13.92	18.05	6.41		4.49	11.12

Table 6 - Percent of Students at Each Performance Level for Grades 7 and 8, May 2013 OAA Administration.

	Grade 7			Grade 8			
	Reading	Math	Writing	Reading	Math	Science	Social Studies
Level	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Advanced	13.75	17.86		25.02	13.90	17.02	
Accelerated	25.77	18.64	Not	33.69	26.29	17.70	Not
Proficient	41.99	37.06	Tested in	27.59	37.13	34.13	Tested
Basic	12.79	17.36	2013.	9.07	16.09	25.48	in 2013.
Limited	5.70	9.07		4.01	6.58	5.67	

Equating and Scaling: The Conversion of Raw Scores to Scaled Scores

Ohio uses the Rasch model (a single parameter logistic model) for computing item difficulties and examinee abilities. The Rasch model is based on the probability that a given examinee answers a given item correctly. This model is used because of its widespread acceptance, its ease of use, and the commercial availability of software for implementing it. The Rasch model provides estimates of the difficulty of each item and the ability of each examinee on a linear scale in log-odds units, or logits.

Equating and Test Form Construction

Equating is a process in which test forms comprised of different items are calibrated to the same scale. Because each test form is made up of items that have been field-tested (and, in some cases, used operationally on a previous test form), item difficulty estimates are available to pre-equate operational forms so that the forms are of approximately equal difficulty for each administration.

Common Item Equating

Following the May 2013 OAA administration, item difficulty values were estimated based on an early return sample for all tested grades. The early return sample was selected to be statistically representative of all Ohio public school students. Because item difficulty estimates were available for all operational items, all could potentially serve as anchor items in the equating process.

Calibrating, equating and linking proceeded through a series of steps. First, the operational administration difficulty values were computed from the early return sample and compared with the "bank" or reference difficulty values. The mean difference between the operational and bank difficulties of the items is called the equating constant, or EQK. The equating constant was added to each difficulty value for items on the current test so that the mean item difficulties were equal. When the equating process was complete, item difficulties from the current administration were calibrated to the bank scale, on which the performance standards are located.

Scaling

Test scores and performance standards are expressed as scaled scores. Scaled scores are invariant across different forms of the same test while raw scores are not because they reflect differences in the difficulty of the test items. A scaled score of, for example, 400 on one administration implies the same overall performance as the same as a scaled score of 400 on any other administration of the same test, but the number of raw score points corresponding to a 400 may shift slightly from administration to administration. Please note that scaled scores are not comparable across different grades or subjects.

After the May 2013 operational test administration, test items were calibrated and test forms were equated. Rasch ability estimates (called theta scores) were computed for each possible raw score. The Rasch ability estimates were then transformed to the appropriate OAA scaled score, all of which are calibrated so that the proficient standard is equal to a scaled score of 400.

Ohio Rounding Rule

Raw scores are integers, but theta scores and unrounded scaled scores are not. Therefore, Ohio uses a rounding rule to match the raw score with the scaled score nearest the performance standard (e.g. 400 for Proficient) to establish the raw score cut points for each performance level. For example, if a raw score of 31 is associated with an observed scaled score of 399.14, and 399.14 is the closest observed scaled score to the proficient performance standard (in this case, 400.00), the scaled score is rounded up to 400 for reporting purposes. For this test, an examinee must have a raw score of 31 or more to be judged proficient.

If the closest scaled score value for an integer raw score exceeds the standard, then that raw score serves as the raw score cut point. For example, if a raw score of 28 produces a rounded scaled score of 398 and a raw score of 29 produces a rounded scaled score of 401, the raw cut score will be 29 and the scaled scores will not be adjusted.

Table 7 - Cut Score Points for Basic, Proficient, Accelerated, and Advanced Standards, May 2013 OAA Administration

Grade	Subject	Score	Limited	Basic	Proficient	Accelerated	Advanced		
	Dandina	Raw	< 25	25	31	36	41		
3	Reading	Scaled	< 385	385	400	415	432		
3	M - 41-	Raw	< 22	22	30	41	46		
	Math	Scaled	< 378	378	400	429	447		
	Reading	Raw	< 18	18	23	36	44		
	Reading	Scaled	< 384	384	400	435	467		
4	4 Math	Raw	< 17	17	24	35	41		
4	Main	Scaled	< 377	377	400	432	452		
	W.i.i.	Raw	Not Tested in 2013.						
	Writing	Scaled							
	Reading	Raw	< 20	20	25	39	42		
	Reading	Scaled	< 384	384	400	441	459		
	Math	Raw	< 19	19	25	35	40		
5	Maui	Scaled	< 382	382	400	424	439		
5	Science	Raw	< 14	14	25	30	38		
	Science	Scaled	< 363	363	400	417	448		
	Social	Raw	N. T						
	Studies	Scaled		NO	ot Tested in 20	15.			

- Notes: 1. The raw score cuts apply to the May 2013 administration only.
 - 2. The scaled scores reported in Tables 7 and 8 are the invariant cut scores that are applied to every test administration. Any apparent discrepancies between the cut scores in Tables 7 and 8 and Tables 12, 13 and 14 occur because the scaled score cuts shown in Tables 7 and 8 may not have occurred during the May 2013 test administration.

Table 8 - Cut Score Points for Basic, Proficient, Accelerated, and Advanced Standards, May 2013 OAA Administration

Grade	Subject	Score	Limited	Basic	Proficient	Accelerated	Advanced		
	Dandina	Raw	< 12	12	18	32	38		
	Reading	Scaled	< 380	380	400	436	456		
6	Math	Raw	< 14	14	20	30	36		
	Math	Scaled	< 378	378	400	429	448		
	D "	Raw	< 14	14	21	33	39		
	Reading	Scaled	< 379	379	400	432	452		
	Math	Raw	< 11	11	17	29	36		
7	Math	Scaled	< 378	378	400	436	458		
	Writing	Raw	Not Tested in 2013.						
		Scaled							
	D 1'	Raw	< 15	15	23	33	40		
	Reading	Scaled	< 378	378	400	428	451		
	M . 41.	Raw	< 10	10	16	28	37		
0	Math	Scaled	< 379	379	400	432	459		
8	G .	Raw	< 11	11	22	32	37		
	Science	Scaled	< 365	365	400	427	445		
	Social	Raw		N.T.	T 1 20:	12			
	Studies	Scaled		No	ot Tested in 20	15.			

- Notes: 1. The raw score cuts apply to the May 2013 administration only.
 - 2. The scaled scores reported in Tables 7 and 8 are the invariant cut scores that are applied to every test administration. Any apparent discrepancies between the cut scores in Tables 7 and 8 and Tables 12, 13 and 14 occur because the scaled score cuts shown in Tables 7 and 8 may not have occurred during the May 2013 test administration.

Subscale bands

Subscale bands are estimated for all subjects tested. Subscale analysis data are provided for diagnostic purposes.

Table 9 - Subscale Bands for the Minimally Proficient Student in Grades 3 and 4, May 2013 OAA Administration.

		Ra	w Score Bar	nds	
	Content Standard	Below	At or Near Proficient	Above	Possible Score
	Acquisition of Vocabulary	0-8	9-10	11	11
Grade 3	Reading Process	0-8	9-12	13-16	16
Reading	Informational Text	0-4	5-7	8-10	10
	Literary Text	0-7	8-10	11-12	12
	Number, Number Sense, and Operations	0-6	7-10	11-14	14
Grade 3	Measurement	0-7	8	9	9
Mathematics	Geometry and Spatial Sense	0-5	6-7	8-10	10
	Patterns, Functions, and Algebra	0-4	5-7	8-9	9
	Data Analysis and Probability	0-4	5-7	8-10	10
	Acquisition of Vocabulary	0-4	5-7	8-9	9
Grade 4	Reading Process	0-6	7-9	10-15	15
Reading	Informational Text	0-5	6-8	9-12	12
	Literary Text	0-5	6-8	9-13	13
	Number, Number Sense, and Operations	0-5	6-8	9-14	14
Grade 4	Measurement	0-1	2-4	5-8	8
Mathematics	Geometry and Spatial Sense	0-5	6-8	9-10	10
	Patterns, Functions, and Algebra	0-4	5-7	8-10	10
	Data Analysis and Probability	0-4	5-7	8-10	10
Grade 4 Writing	Not To	ested in 201	3.		

Table 10 - Subscale Bands for the Minimally Proficient Student in Grades 5 and 6, May 2013 OAA Administration.

		R	aw Score Ba	nds	
	Content Standard	Below	At or Near Proficient	Above	Possible Score
	Acquisition of Vocabulary	0-4	5-7	8-9	9
Grade 5	Reading Process	0-9	10-12	13-17	17
Reading	Informational Text	0-3	4-6	7-12	12
	Literary Text	0-5	6-8	9-11	11
	Number, Number Sense, and Operations	0-7	8-11	12-14	14
Grade 5	Measurement	0-3	4-6	7-9	9
Mathematics	Geometry and Spatial Sense	0-5	6-8	9-10	10
	Patterns, Functions, and Algebra	0-2	3-5	6-10	10
	Data Analysis and Probability	0-3	4-6	7-9	9
	Physical Science	0-4	5-7	8-11	11
Grade 5	Life Science	0-8	9-11	12-13	13
Science	Earth and Space Science	0-6	7-8	9-10	10
	Science and Technology	0-4	5-7	8-14	14
Grade 5 Social Studies	Not Tes	sted in 201			
	Acquisition of Vocabulary	0-2	3-5	6-8	8
Grade 6	Reading Process	0-3	4-6	7-12	12
Reading	Informational Text	0-5	6-9	10-17	17
	Literary Text	0-4	5-7	8-12	12
	Number, Number Sense, and Operations	0-4	5-7	8-14	14
Grade 6	Measurement	0-2	3-5	6-8	8
Mathematics	Geometry and Spatial Sense	0-2	3-5	6-8	8
	Patterns, Functions, and Algebra	0-4	5-7	8-11	11
	Data Analysis and Probability	0-3	4-6	7-9	9

Table 11 - Subscale Bands for the Minimally Proficient Student in Grades 7 and 8, May 2013 OAA Administration.

		Ra	w Score Bar	nds			
	Content Standard	Below	At or Near Proficient	Above	Possible Score		
	Acquisition of Vocabulary	0-4	5-7	8-9	9		
Grade 7	Reading Process	0-5	6-8	9-12	12		
Reading	Informational Text	0-5	6-8	9-13	13		
	Literary Text	0-4	5-7	8-13	13		
	Number, Number Sense, and Operations	0-3	4-6	7-12	12		
Grade 7	Measurement	0-2	3-5	6-9	9		
Mathematics	Geometry and Spatial Sense	0-3	4-6	7-10	10		
	Patterns, Functions, and Algebra	0-2	3-5	6-10	10		
	Data Analysis and Probability	0-2	3-4	5-9	9		
Grade 7 Writing		Not Tested in 2013.					
	Acquisition of Vocabulary	0-3	4-6	7-9	9		
Grade 8	Reading Process	0-5	6-8	9-10	10		
Reading	Informational Text	0-5	6-9	10-15	15		
	Literary Text	0-5	6-9	10-14	14		
	Number, Number Sense, and Operations	0-2	3-5	6-10	10		
Grade 8	Measurement	0-2	3-5	6-8	8		
Mathematics	Geometry and Spatial Sense	0-2	3-5	6-8	8		
	Patterns, Functions, and Algebra	0-4	5-7	8-11	11		
	Data Analysis and Probability	0-2	3-5	6-9	9		
	Physical Science	0-6	7-9	10-14	14		
Grade 8	Life Science	0-4	5-7	8-11	11		
Science	Earth and Space Science	0-5	6-8	9-12	12		
	Science and Technology	0-4	5-7	8-11	11		
Grade 8 Social Studies	Not Te	sted in 201	3.				

Tables of Concordance between Raw Scores and Cut Scores

Tables 12, 13 and 14 provide the concordance between raw scores and scaled scores for all tests in the May 2013 administration of the Ohio Achievement Assessments¹.

Table 12 - Raw Score to Scaled Score Conversion Grades 3 and 4, May 2013 OAA Administration.

Scaled Sco	res Correspondi		core Points for		and Subject		
	Grade	e 3		Grade 4			
Raw Score	Reading	Math	Reading	Math	Writing		
0	259	240	263	239			
1	278	261	284	263			
2	296	282	304	286			
3	308	295	316	301			
4	316	305	326	311			
5	323	312	333	320			
6	329	319	339	327			
7	334	325	345	334			
8	338	330	350	340			
9	342	335	355	345			
10	346	340	359	350			
11	349	344	363	354			
12	352	348	366	359			
13	355	351	370	363			
14	358	355	373	367			
15	361	358	377	371	Not Tested in 2013.		
16	364	361	380	374	111 2013.		
17	366	364	383	378			
18	369	367	386	381			
19	371	370	389	384			
20	373	373	391	387			
21	376	376	394	391			
22	378	379	397	394			
23	380	381	400	397			
24	383	384	402	400			
25	385	386	405	402			
26	387	389	408	405			
27	390	392	410	408			
28	392	394	413	411			
29	394	396	416	414			
30	397	400	418	417			

¹ Some students were administered a breach form to remedy some inadvertent testing irregularity. Irregular forms will have different tables of concordance than those reported here.

Table 12 - Raw Score to Scaled Score Conversion Grades 3 and 4, May 2013 OAA Administration (continued).

	Grad	e 3	Grade 4			
Raw Score	Reading	Math	Reading	Math	Writing	
31	400	401	424	419		
32	402	404	427	422		
33	405	406	429	425		
34	407	409	432	428		
35	410	411	435	432		
36	415	414	438	434		
37	416	416	442	437		
38	420	419	445	440		
39	423	422	449	444		
40	427	425	453	447		
41	432	429	457	452	Not Teste	
42	435	431	462	454	in 2013.	
43	440	435	468	459		
44	446	439	475	463		
45	452	443	483	468		
46	461	448	495	473		
47	472	453	514	479		
48	490	460	534	487		
49	509	469		496		
50		481		508		
51		501		530		
52		521		551		

Table 13 - Raw Score to Scaled Score Conversion Grades 5 and 6, May 2013 OAA Administration.

Scaled	Scores Corre	esponding to	Raw Score	Points for Ea	ach Grade an	d Subject
		Gra	Grade 6			
Raw Score	Reading	Math	Science	Social Studies	Reading	Math
0	247	245	239		267	235
1	269	268	262		290	262
2	291	291	285		313	289
3	304	305	299		327	305
4	314	316	310		337	317
5	322	324	318		346	327
6	329	331	326		353	335
7	335	337	332		359	343
8	340	343	338		364	349
9	345	347	343		369	355
10	350	352	348		374	360
11	354	356	352		378	365
12	358	360	356		382	370
13	361	364	360		385	375
14	365	367	364	Not	389	379
15	369	371	368	Tested in	392	383
16	372	374	371	2013.	395	387
17	375	377	374		398	390
18	378	380	378		400	394
19	381	383	381		403	397
20	384	386	384		406	401
21	387	389	387		408	404
22	390	391	390		411	407
23	393	394	393		413	410
24	396	397	397		416	413
25	400	400	400		418	416
26	402	402	403		421	419
27	405	404	406		423	422
28	408	407	409		426	424
29	410	409	413		428	427
30	413	412	417		431	430

Table 13 - Raw Score to Scaled Score Conversion Grades 5 and 6, May 2013 OAA Administration (continued).

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject Grade 5 Grade 6								
		Grae	Grade 6					
Raw Score	Reading	Math	Science	Social Studies	Reading	Math		
31	416	414	420		434	433		
32	419	417	423		436	436		
33	422	420	427		439	439		
34	425	422	431		442	442		
35	429	425	435		446	446		
36	432	428	440		449	449		
37	435	431	445	Not Tested in 2013.	452	452		
38	439	434	450		456	456		
39	443	437	455		460	460		
40	447	440	461		464	464		
41	451	444	468		469	469		
42	459	447	475		474	474		
43	462	451	483		479	479		
44	468	456	493		486	485		
45	475	461	504		493	492		
46	483	466	519		503	501		
47	495	473	542		516	511		
48	514	480	565		538	526		
49	534	490			559	550		
50		503				575		
51		526						
52		548						

Table 14 - Raw Score to Scaled Score Conversion Grades 7 and 8, May 2013 OAA Administration.

Scaled	Scores Corre	esponding	to Raw Sco	re Points fo	r Each Gra	de and Su	bject	
		Grade 7		Grade 8				
Raw Score	Reading	Math	Writing	Reading	Math	Science	Social Studies	
0	271	268		261	288	257		
1	291	291		283	308	280		
2	312	314		304	327	302		
3	325	328		317	339	316		
4	334	338		327	348	326		
5	341	346		334	355	334		
6	347	353		341	361	341		
7	353	359		346	366	347		
8	357	365		352	371	352		
9	362	370		356	375	357		
10	366	374		360	379	361		
11	370	378		364	383	365		
12	373	383		368	387	369		
13	376	386		371	390	372		
14	380	390	Not	375	393	376	Not	
15	383	393	Tested in	378	396	379	Tested in	
16	386	397	2013.	381	400	382	2013.	
17	389	400		384	402	385		
18	392	403		387	405	388		
19	395	406		389	408	391		
20	397	409		392	411	393		
21	400	412		395	413	396		
22	403	415		398	416	400		
23	405	418		400	419	401		
24	408	421		403	421	404		
25	411	424		406	424	407		
26	413	426		408	427	409		
27	416	429		411	429	412		
28	418	432		414	432	415		
29	421	436		416	435	418		
30	424	438		419	437	421		

Table 14 - Raw Score to Scaled Score Conversion Grades 7 and 8, May 2013 OAA Administration. (continued)

		Grade 7		Grade 8				
Raw Score	Reading	Math	Writing	Reading	Math	Science	Social Studie	
31	426	441		422	440	424		
32	429	444		425	443	427		
33	432	447		428	446	430		
34	435	450		431	448	434		
35	438	454		434	451	437		
36	441	458		438	454	441		
37	444	461		441	459	445	- - -	
38	448	464		445	461	449		
39	452	468		449	465	454		
40	456	472		453	470	459	Not	
41	461	477	Not	457	475	465	Tested	
42	467	482	Tested in 2013.	462	481	471	in	
43	473	487	2013.	468	489	478	2013.	
44	482	493		475	500	486		
45	493	499		484	519	497		
46	513	507		496	537	511	- - - -	
47	533	517		517		535		
48		530		538		558		
49		552						
50		574						
51								
52								