OHIO ACHIEVEMENT ASSESSMENTS
MAY 2012 ADMINISTRATION

STATISTICAL SUMMARY

This document provides a summary of information from the May 2012 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 2012 Administration of the Ohio Achievement Assessments for Grades 3 and 4.

	Grade 3		Grade 4		
Parameter	**Reading**	**Math**	**Reading**	**Math**	**Writing**
Students Tested	123,619	127,088	127,937	127,821	Not Tested in 2012.
Max Raw Score	49	52	49	52	
Max Scaled Score	507	522	539	554	
Min Scaled Score	252	244	267	245	
Raw Score Mean	35.46	37.11	31.82	33.07	
Raw Score Std. Deviation	8.12	8.48	8.78	10.22	
Raw Score SEM	3.09	3.00	3.21	3.33	
Scaled Score Mean	417.88	423.76	425.97	426.40	
Scaled Score Std. Deviation	25.75	29.89	27.18	34.65	
Scaled Score SEM	9.80	10.58	9.93	11.31	
Reliability	0.86	0.87	0.87	0.89	

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 2012 Administration of the Ohio Achievement Assessments for Grades 5 and 6.

	Grade 5				Grade 6	
Parameter	**Reading**	**Math**	**Science**	**Social Studies**	**Reading**	**Math**
Students Tested	130,401	130,066	130,418	Not Tested in 2012.	131,507	130,875
Max Raw Score	49	52	48		49	50
Max Scaled Score	533	552	548		561	568
Min Scaled Score	252	244	243		272	241
Raw Score Mean	32.14	29.48	29.27		27.90	29.71
Raw Score Std. Deviation	9.05	11.39	9.17		8.97	10.56
Raw Score SEM	3.28	3.41	3.36		3.42	3.49
Scaled Score Mean	420.11	415.66	415.41		428.56	430.73
Scaled Score Std. Deviation	29.78	37.72	31.16		26.40	38.58
Scaled Score SEM	10.78	11.28	11.43		10.08	12.75
Reliability	0.87	0.91	0.87		0.85	0.89

Table 3 – Summary of Parameters from the May 2012 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	131,461	130,803	Not Tested in 2012.	131,446	130,809	131,385	Not Tested in 2012.
Max Raw Score	47	50		48	46	48	
Max Scaled Score	534	564		549	543	559	
Min Scaled Score	271	277		260	285	250	
Raw Score Mean	28.24	23.82		30.54	23.54	26.43	
Raw Score Std. Deviation	9.39	10.54		8.75	8.71	9.07	
Raw Score SEM	3.31	3.36		3.16	3.07	3.22	
Scaled Score Mean	421.91	420.44		426.24	421.65	415.46	
Scaled Score Std. Deviation	28.67	32.57		29.80	27.55	30.32	
Scaled Score SEM	10.10	10.39		10.76	9.73	10.75	
Reliability	0.88	0.90		0.87	0.88	0.87	

Table 4 - Percent of Students at Each Performance Level for Grades 3 and 4, May 2012 OAA Administration.

	Grade 3		Grade 4		
	Reading	**Math**	**Reading**	**Math**	**Writing**
Level	**Percent**	**Percent**	**Percent**	**Percent**	**Percent**
Advanced	32.03	24.48	7.92	23.58	Not Tested in 2012.
Accelerated	26.43	21.26	32.56	22.47	
Proficient	20.06	34.27	43.33	32.71	
Basic	11.58	12.94	9.23	13.47	
Limited	9.91	7.05	6.97	7.77	

Table 5 - Percent of Students at Each Performance Level for Grades 5 and 6, May 2012 OAA Administration.

	Grade 5				Grade 6	
	Reading	**Math**	**Science**	**Social Studies**	**Reading**	**Math**
Level	**Percent**	**Percent**	**Percent**	**Percent**	**Percent**	**Percent**
Advanced	10.74	28.71	17.62	Not Tested in 2012.	15.28	33.58
Accelerated	17.24	14.38	31.36		27.71	18.97
Proficient	49.05	24.56	23.68		44.30	27.59
Basic	11.95	14.17	22.65		9.63	12.16
Limited	11.02	18.19	4.67		3.08	7.70

Table 6 - Percent of Students at Each Performance Level for Grades 7 and 8, May 2012 OAA Administration.

	Grade 7			Grade 8			
	Reading	**Math**	**Writing**	**Reading**	**Math**	**Science**	**Social Studies**
Level	**Percent**	**Percent**	**Percent**	**Percent**	**Percent**	**Percent**	**Percent**
Advanced	14.85	14.46	Not Tested in 2012.	19.52	9.86	18.33	Not Tested in 2012.
Accelerated	23.05	16.90		31.95	27.60	18.26	
Proficient	41.95	42.42		31.88	42.30	35.16	
Basic	13.68	18.14		10.90	15.73	24.29	
Limited	6.48	8.08		5.75	4.51	3.95	

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 2012 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 2012 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 2012 OAA Administration

Grade	Subject	Score	Limited	Basic	Proficient	Accelerated	Advanced
3	Reading	Raw	< 24	24	30	36	41
		Scaled	< 385	385	400	415	432
	Math	Raw	< 23	23	31	40	44
		Scaled	< 378	378	400	429	447
4	Reading	Raw	< 17	17	23	36	43
		Scaled	< 384	384	400	435	467
	Math	Raw	< 17	17	25	36	42
		Scaled	< 377	377	400	432	452
	Writing	Raw	Not Tested in 2012.				
		Scaled					
5	Reading	Raw	< 20	20	26	39	43
		Scaled	< 384	384	400	441	459
	Math	Raw	< 18	18	24	33	38
		Scaled	< 382	382	400	424	439
	Science	Raw	< 13	13	24	31	39
		Scaled	< 363	363	400	417	448
	Social Studies	Raw	Not Tested in 2012.				
		Scaled					

Notes: 1. The raw score cuts apply to the May 2012 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 2012 test administration.

Table 8 - Cut Score Points for Basic, Proficient, Accelerated, and Advanced Standards, May 2012 OAA Administration

Grade	Subject	Score	Limited	Basic	Proficient	Accelerated	Advanced
6	Reading	Raw	< 11	11	17	31	38
		Scaled	< 380	380	400	436	456
	Math	Raw	< 14	14	20	30	36
		Scaled	< 378	378	400	429	448
7	Reading	Raw	< 13	13	20	33	39
		Scaled	< 379	379	400	432	452
	Math	Raw	< 10	10	16	30	37
		Scaled	< 378	378	400	436	458
	Writing	Raw	Not Tested in 2012.				
		Scaled					
8	Reading	Raw	< 15	15	22	32	39
		Scaled	< 378	378	400	428	451
	Math	Raw	< 10	10	16	27	36
		Scaled	< 379	379	400	432	459
	Science	Raw	< 11	11	21	31	36
		Scaled	< 365	365	400	427	445
	Social Studies	Raw	Not Tested in 2012.				
		Scaled					

Notes: 1. The raw score cuts apply to the May 2012 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 2012 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 2012 OAA Administration.

		Raw Score Bands			
	Content Standard	**Below**	**At or Near Proficient**	**Above**	**Possible Score**
Grade 3 Reading	Acquisition of Vocabulary	0-8	9-10	11	11
	Reading Process	0-8	9-12	13-17	17
	Informational Text	0-4	5-7	8-11	11
	Literary Text	0-5	6-8	9-10	10
Grade 3 Mathematics	Number, Number Sense, and Operations	0-7	8-10	11-14	14
	Measurement	0-4	5-7	8-10	10
	Geometry and Spatial Sense	0-4	5-6	7-9	9
	Patterns, Functions, and Algebra	0-5	6-8	9-10	10
	Data Analysis and Probability	0-6	7-8	9	9
Grade 4 Reading	Acquisition of Vocabulary	0-4	5-7	8-9	9
	Reading Process	0-7	8-10	11-17	17
	Informational Text	0-3	4-6	7-11	11
	Literary Text	0-5	6-8	9-12	12
Grade 4 Mathematics	Number, Number Sense, and Operations	0-6	7-9	10-14	14
	Measurement	0-2	3-5	6-8	8
	Geometry and Spatial Sense	0-5	6-8	9-10	10
	Patterns, Functions, and Algebra	0-3	4-6	7-10	10
	Data Analysis and Probability	0-4	5-7	8-10	10
Grade 4 Writing	Not Tested in 2012.				

Table 10 - Subscale Bands for the Minimally Proficient Student in Grades 5 and 6, May 2012 OAA Administration.

		Raw Score Bands			
	Content Standard	**Below**	**At or Near Proficient**	**Above**	**Possible Score**
Grade 5 Reading	Acquisition of Vocabulary	0-4	5-6	7-8	8
	Reading Process	0-9	10-12	13-17	17
	Informational Text	0-4	5-7	8-11	11
	Literary Text	0-5	6-9	10-13	13
Grade 5 Mathematics	Number, Number Sense, and Operations	0-6	7-10	11-14	14
	Measurement	0-3	4-6	7-9	9
	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	0-2	3-5	6-9	9
Grade 5 Science	Physical Science	0-6	7-10	11-14	14
	Life Science	0-4	5-7	8-10	10
	Earth and Space Science	0-5	6-8	9-10	10
	Science and Technology	0-5	6-8	9-14	14
Grade 5 Social Studies	Not Tested in 2012.				
Grade 6 Reading	Acquisition of Vocabulary	0-3	4-6	7-9	9
	Reading Process	0-3	4-6	7-11	11
	Informational Text	0-4	5-8	9-17	17
	Literary Text	0-3	4-6	7-12	12
Grade 6 Mathematics	Number, Number Sense, and Operations	0-5	6-8	9-14	14
	Measurement	0-2	3-5	6-8	8
	Geometry and Spatial Sense	0-3	4-6	7-8	8
	Patterns, Functions, and Algebra	0-3	4-6	7-12	12
	Data Analysis and Probability	0-2	3-5	6-8	8

Table 11 - Subscale Bands for the Minimally Proficient Student in Grades 7 and 8, May 2012 OAA Administration.

		Raw Score Bands			
	Content Standard	**Below**	**At or Near Proficient**	**Above**	**Possible Score**
Grade 7 Reading	Acquisition of Vocabulary	0-3	4-6	7-8	8
	Reading Process	0-3	4-6	7-10	10
	Informational Text	0-6	7-10	11-17	17
	Literary Text	0-4	5-7	8-12	12
Grade 7 Mathematics	Number, Number Sense, and Operations	0-3	4-6	7-10	10
	Measurement	0-2	3-5	6-10	10
	Geometry and Spatial Sense	0-2	3-5	6-10	10
	Patterns, Functions, and Algebra	0-2	3-6	7-11	11
	Data Analysis and Probability	0-2	3-5	6-9	9
Grade 7 Writing	Not Tested in 2012.				
Grade 8 Reading	Acquisition of Vocabulary	0-4	5-7	8-9	9
	Reading Process	0-5	6-8	9-12	12
	Informational Text	0-5	6-8	9-14	14
	Literary Text	0-4	5-8	9-13	13
Grade 8 Mathematics	Number, Number Sense, and Operations	0-3	4-6	7-9	9
	Measurement	0-1	2-4	5-8	8
	Geometry and Spatial Sense	0-2	3-5	6-9	9
	Patterns, Functions, and Algebra	0-2	3-6	7-11	11
	Data Analysis and Probability	0-3	4-6	7-9	9
Grade 8 Science	Physical Science	0-4	5-7	8-10	10
	Life Science	0-4	5-8	9-12	12
	Earth and Space Science	0-5	6-8	9-12	12
	Science and Technology	0-4	5-7	8-14	14
Grade 8 Social Studies	Not Tested in 2012.				

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 2012 administration of the Ohio Achievement Assessments[1].

Table 12 - Raw Score to Scaled Score Conversion Grades 3 and 4, May 2012 OAA Administration.

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject					
	Grade 3		Grade 4		
Raw Score	**Reading**	**Math**	**Reading**	**Math**	**Writing**
0	252	244	267	245	Not Tested in 2012.
1	271	264	287	268	
2	291	284	308	291	
3	303	297	320	305	
4	312	306	329	315	
5	319	313	337	323	
6	325	319	343	330	
7	331	325	348	336	
8	336	330	353	342	
9	340	334	358	347	
10	344	338	362	351	
11	348	342	365	355	
12	352	346	369	359	
13	355	350	372	363	
14	358	353	376	367	
15	361	356	379	370	
16	364	359	382	374	
17	367	362	**385**	**377**	
18	369	365	387	380	
19	372	368	390	383	
20	375	371	393	387	
21	377	374	395	390	
22	380	377	398	392	
23	382	**379**	**401**	395	
24	**385**	382	403	398	
25	387	385	406	**401**	
26	390	387	408	404	
27	392	390	411	407	
28	395	393	413	410	
29	397	396	416	412	
30	**400**	398	418	415	

[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 2012 OAA Administration (continued).

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject					
	Grade 3		**Grade 4**		
Raw Score	**Reading**	**Math**	**Reading**	**Math**	**Writing**
31	402	**401**	421	418	Not Tested in 2012.
32	405	404	424	421	
33	408	407	427	424	
34	410	410	429	426	
35	413	413	432	429	
36	**416**	416	**435**	**432**	
37	419	419	439	435	
38	422	423	442	438	
39	425	426	446	442	
40	429	**430**	450	445	
41	**432**	434	454	449	
42	437	438	459	**452**	
43	441	442	**467**	456	
44	446	**447**	470	461	
45	453	451	478	466	
46	461	456	487	471	
47	471	461	499	478	
48	489	467	519	485	
49	507	475	539	495	
50		486		508	
51		504		531	
52		522		554	

Table 13 - Raw Score to Scaled Score Conversion Grades 5 and 6, May 2012 OAA Administration.

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject						
	Grade 5				Grade 6	
Raw Score	**Reading**	**Math**	**Science**	**Social Studies**	**Reading**	**Math**
0	252	244	243	Not Tested in 2012.	272	241
1	274	267	266		294	268
2	295	291	289		317	294
3	308	305	304		330	310
4	318	316	314		340	322
5	325	324	322		348	331
6	332	331	330		355	339
7	337	338	336		361	346
8	342	343	341		366	352
9	347	348	347		371	357
10	351	353	351		375	362
11	355	357	356		**380**	367
12	359	361	360		383	371
13	363	365	**364**		387	375
14	366	369	367		390	**379**
15	369	372	371		393	383
16	372	376	374		396	386
17	375	379	378		**400**	390
18	378	**382**	381		402	393
19	381	385	384		405	396
20	**384**	388	387		408	**400**
21	387	391	390		410	402
22	390	393	393		413	405
23	392	396	396		415	408
24	395	**400**	**400**		418	411
25	398	402	402		420	414
26	**400**	404	404		423	417
27	403	407	407		425	420
28	406	410	410		428	422
29	408	412	412		431	425
30	411	415	415		433	**429**

Table 13 - Raw Score to Scaled Score Conversion Grades 5 and 6, May 2012 OAA Administration (continued).

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject						
	Grade 5				**Grade 6**	
Raw Score	**Reading**	**Math**	**Science**	**Social Studies**	**Reading**	**Math**
31	414	418	**418**	Not Tested in 2012.	**436**	431
32	417	421	421		438	434
33	420	**424**	424		441	438
34	422	426	427		444	441
35	426	429	430		447	444
36	429	432	434		450	**448**
37	432	435	437		453	451
38	435	**439**	441		**456**	455
39	**441**	442	**448**		460	459
40	443	445	450		464	463
41	447	449	456		469	467
42	452	453	462		473	471
43	**459**	457	469		479	476
44	463	461	477		485	482
45	470	466	487		493	488
46	479	472	501		503	496
47	492	478	525		516	506
48	512	486	548		539	520
49	533	495			561	544
50		508				568
51		530				
52		552				

Table 14 - Raw Score to Scaled Score Conversion Grades 7 and 8, May 2012 OAA Administration.

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject							
	Grade 7			Grade 8			
Raw Score	**Reading**	**Math**	**Writing**	**Reading**	**Math**	**Science**	**Social Studies**
0	271	277	Not Tested in 2012.	260	285	250	Not Tested in 2012.
1	292	299		281	305	274	
2	313	322		303	325	297	
3	325	335		316	337	312	
4	335	345		326	346	323	
5	342	353		334	353	331	
6	348	359		340	359	339	
7	354	365		346	365	345	
8	359	370		351	370	351	
9	363	375		356	374	356	
10	368	**379**		360	**379**	360	
11	372	383		364	382	**365**	
12	375	386		368	386	369	
13	**379**	390		372	390	373	
14	382	393		375	393	376	
15	385	396		**378**	396	380	
16	388	**400**		382	**400**	383	
17	391	402		385	403	387	
18	394	405		388	406	390	
19	397	408		391	409	393	
20	**400**	410		394	412	396	
21	402	413		396	415	**400**	
22	404	416		**400**	418	402	
23	407	418		402	420	405	
24	409	421		405	423	407	
25	412	424		408	426	410	
26	414	426		410	429	413	
27	417	429		413	**432**	416	
28	420	431		416	435	419	
29	422	434		419	437	422	
30	425	**437**		422	440	425	

Table 14 - Raw Score to Scaled Score Conversion Grades 7 and 8, May 2012 OAA Administration. (continued)

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject							
	Grade 7			**Grade 8**			
Raw Score	**Reading**	**Math**	**Writing**	**Reading**	**Math**	**Science**	**Social Studies**
31	427	439	Not Tested in 2012.	425	443	**428**	Not Tested in 2012.
32	430	442		**428**	446	431	
33	**433**	445		431	449	434	
34	436	448		434	452	438	
35	439	451		437	455	441	
36	442	454		441	**459**	**445**	
37	446	**458**		445	462	449	
38	449	461		449	466	453	
39	**453**	465		**453**	470	457	
40	458	468		458	474	462	
41	462	473		463	480	468	
42	468	477		469	486	474	
43	475	482		475	494	481	
44	483	487		483	505	489	
45	495	493		493	524	499	
46	515	500		506	543	513	
47	534	510		527		536	
48		522		549		559	
49		543					
50		564					
51							
52							