

Ohio Achievement Assessments Statistical Summary

May 2014 Test Administration

This document provides a summary of information from the May 2014 administration of the Ohio Achievement Assessments to students in Grades 3-8. 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 scale scores.

Table 1 - Summary of Parameters from the May 2014 Administration of the Ohio Achievement Assessments for Grades 3 and 4

Parameter	Grade 3		Grade 4		
	Reading	Math	Reading	Math	Writing
Students Tested	122,802	125,569	125,979	125,833	Not Tested in 2014
Max Raw Score	49	52	49	52	
Max Scaled Score	496	522	533	558	
Min Scaled Score	260	245	271	240	
Raw Score Mean	38.56	37.03	34.43	33.19	
Raw Score Std. Deviation	8.31	9.08	9.59	10.31	
Raw Score SEM	2.99	3.12	3.17	3.24	
Scaled Score Mean	423.35	424.49	433.14	426.07	
Scaled Score Std. Deviation	28.73	31.48	31.89	36.42	
Scaled Score SEM	10.34	10.81	10.55	11.46	
Reliability	0.87	0.88	0.89	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 includes 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 data are not available for these tests.

Table 2 - Summary of Parameters from the May 2014 Administration of the Ohio Achievement Assessments for Grades 5 and 6

Parameter	Grade 5				Grade 6	
	Reading	Math	Science	Social Studies	Reading	Math
Students Tested	126,615	126,204	126,547	Not Tested in 2014.	128,017	127,226
Max Raw Score	49	52	48		49	50
Max Scaled Score	535	557	558		556	575
Min Scaled Score	250	239	236		277	236
Raw Score Mean	30.96	28.48	28.71		27.67	28.78
Raw Score Std. Deviation	9.39	10.86	8.36		9.71	10.93
Raw Score SEM	3.36	3.45	2.98		3.56	3.47
Scaled Score Mean	416.31	415.14	416.55		428.15	427.80
Scaled Score Std. Deviation	30.24	36.98	32.81		27.93	40.98
Scaled Score SEM	10.84	11.75	11.72		10.24	13.03
Reliability	0.87	0.90	0.87		0.87	0.90

Table 3 - Summary of Parameters from the May 2014 Administration of the Ohio Achievement Assessments for Grades 7 and 8

Parameter	Grade 7			Grade 8			
	Reading	Math	Writing	Reading	Math	Science	Social Studies
Students Tested	130,958	129,962	Not Tested in 2014	131,933	131,226	131,813	Not Tested in 2014
Max Raw Score	47	50		48	46	48	
Max Scaled Score	536	565		539	547	544	
Min Scaled Score	269	277		262	282	255	
Raw Score Mean	29.21	24.38		32.49	24.70	26.77	
Raw Score Std. Deviation	8.91	11.19		8.74	9.62	9.98	
Raw Score SEM	3.28	3.50		3.34	3.14	3.36	
Scaled Score Mean	426.31	422.60		430.57	424.56	414.38	
Scaled Score Std. Deviation	27.72	34.26		28.45	31.69	32.56	
Scaled Score SEM	10.21	10.71		10.87	10.35	10.97	
Reliability	0.86	0.90		0.85	0.89	0.89	

Table 4 - Percent of Students at Each Performance Level for Grades 3 and 4, May 2014 Ohio Achievement Assessment Administration

Level	Grade 3		Grade 4		
	Reading	Math	Reading	Math	Writing
	Percent	Percent	Percent	Percent	Percent
Advanced	40.54	27.28	17.60	24.33	Not Tested in 2014.
Accelerated	24.93	19.57	32.91	23.04	
Proficient	16.51	33.45	35.80	31.33	
Basic	9.99	12.26	7.58	11.93	
Limited	8.03	7.44	6.12	9.37	

Table 5 - Percent of Students at Each Performance Level for Grades 5 and 6, May 2014 Ohio Achievement Assessment Administration

Level	Grade 5				Grade 6	
	Reading	Math	Science	Social Studies	Reading	Math
	Percent	Percent	Percent	Percent	Percent	Percent
Advanced	9.37	27.00	19.36	Not Tested in 2014	15.17	31.90
Accelerated	10.77	14.59	30.19		26.75	18.03
Proficient	51.73	25.98	19.99		42.85	26.97
Basic	13.84	13.17	25.88		11.38	12.60
Limited	13.93	19.27	4.58		3.85	10.50

Table 6 - Percent of Students at Each Performance Level for Grades 7 and 8, May 2014 Ohio Achievement Assessment Administration

Level	Grade 7			Grade 8			
	Reading	Math	Writing	Reading	Math	Science	Social Studies
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Advanced	19.04	15.55	Not Tested in 2014	23.87	13.93	19.51	Not Tested in 2014
Accelerated	26.45	21.10		31.98	25.03	15.84	
Proficient	38.61	36.70		31.51	41.30	32.53	
Basic	10.82	18.14		9.40	13.26	26.73	
Limited	5.08	8.50		3.25	6.49	5.38	

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. Ohio uses this model because of its widespread acceptance, ease of use and the commercial availability of implementation software. 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 2014 Ohio Achievement Assessment 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 occurred 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 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 2014 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 Ohio Achievement Assessment 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 2014 Ohio Achievement Assessment Administration

Grade	Subject	Score	Limited	Basic	Proficient	Accelerated	Advanced
3	Reading	Raw	< 25	25	32	38	43
		Scaled	< 385	385	400	415	432
	Math	Raw	< 22	22	30	40	44
		Scaled	< 378	378	400	429	447
4	Reading	Raw	< 17	17	23	37	44
		Scaled	< 384	384	400	435	467
	Math	Raw	< 18	18	25	36	42
		Scaled	< 377	377	400	432	452
	Writing	Raw	Not Tested in 2014				
		Scaled					
5	Reading	Raw	< 20	20	26	40	43
		Scaled	< 384	384	400	441	459
	Math	Raw	< 18	18	23	32	37
		Scaled	< 382	382	400	424	439
	Science	Raw	< 14	14	25	30	37
		Scaled	< 363	363	400	417	448
	Social Studies	Raw	Not Tested in 2014				
		Scaled					

- Notes: 1. The raw score cuts apply to the May 2014 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 2014 test administration.

Table 8 - Cut Score Points for Basic, Proficient, Accelerated and Advanced Standards, May 2014 Ohio Achievement Assessment Administration

Grade	Subject	Score	Limited	Basic	Proficient	Accelerated	Advanced
6	Reading	Raw	< 11	11	17	31	39
		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	32	38
		Scaled	< 379	379	400	432	452
	Math	Raw	< 10	10	16	29	38
		Scaled	< 378	378	400	436	458
	Writing	Raw	Not Tested in 2014				
		Scaled					
8	Reading	Raw	< 14	14	22	33	40
		Scaled	< 378	378	400	428	451
	Math	Raw	< 11	11	16	28	37
		Scaled	< 379	379	400	432	459
	Science	Raw	< 11	11	22	32	37
		Scaled	< 365	365	400	427	445
	Social Studies	Raw	Not Tested in 2014				
		Scaled					

- Notes: 1. The raw score cuts apply to the May 2014 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 2014 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 2014 Ohio Achievement Assessment Administration

	Content Standard	Raw Score Bands			Possible Score
		Below	At or Near Proficient	Above	
Grade 3 Reading	Acquisition of Vocabulary	0-6	7-9	10	10
	Reading Process	0-10	11-13	14-16	16
	Informational Text	0-5	6-8	9-11	11
	Literary Text	0-7	8-10	11-12	12
Grade 3 Mathematics	Number, Number Sense and Operations	0-6	7-9	10-14	14
	Measurement	0-6	7-8	9-10	10
	Geometry and Spatial Sense	0-4	5-7	8-9	9
	Patterns, Functions and Algebra	0-5	6-8	9	9
	Data Analysis and Probability	0-5	6-7	8-10	10
Grade 4 Reading	Acquisition of Vocabulary	0-4	5-6	7-8	8
	Reading Process	0-7	8-11	12-17	17
	Informational Text	0-4	5-7	8-13	13
	Literary Text	0-4	5-7	8-11	11
Grade 4 Mathematics	Number, Number Sense and Operations	0-5	6-9	10-14	14
	Measurement	0-3	4-6	7-9	9
	Geometry and Spatial Sense	0-4	5-7	8-9	9
	Patterns, Functions and Algebra	0-3	4-6	7-9	9
	Data Analysis and Probability	0-5	6-8	9-11	11
Grade 4 Writing	Not Tested in 2014				

**Table 10 - Subscale Bands for the Minimally Proficient Student in Grades 5 and 6,
May 2014 Ohio Achievement Assessment Administration**

	Content Standard	Raw Score Bands			Possible Score
		Below	At or Near Proficient	Above	
Grade 5 Reading	Acquisition of Vocabulary	0-4	5-7	8	8
	Reading Process	0-7	8-11	12-16	16
	Informational Text	0-5	6-8	9-12	12
	Literary Text	0-6	7-9	10-13	13
Grade 5 Mathematics	Number, Number Sense, and Operations	0-6	7-9	10-14	14
	Measurement	0-3	4-6	7-10	10
	Geometry and Spatial Sense	0-4	5-7	8-9	9
	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	0-5	6-8	9-13	13
	Life Science	0-6	7-9	10-12	12
	Earth and Space Science	0-4	5-7	8-10	10
	Science and Technology	0-5	6-8	9-13	13
Grade 5 Social Studies	Not Tested in 2014				
Grade 6 Reading	Acquisition of Vocabulary	0-3	4-5	6-8	8
	Reading Process	0-3	4-6	7-10	10
	Informational Text	0-3	4-7	8-14	14
	Literary Text	0-4	5-8	9-17	17
Grade 6 Mathematics	Number, Number Sense, and Operations	0-5	6-8	9-14	14
	Measurement	0-1	2-5	6-8	8
	Geometry and Spatial Sense	0-3	4-5	6-8	8
	Patterns, Functions, and Algebra	0-3	4-7	8-12	12
	Data Analysis and Probability	0-3	4-6	7-8	8

**Table 11 - Subscale Bands for the Minimally Proficient Student in Grades 7 and 8,
May 2014 Ohio Achievement Assessment Administration**

	Content Standard	Raw Score Bands			Possible Score
		Below	At or Near Proficient	Above	
Grade 7 Reading	Acquisition of Vocabulary	0-3	4-6	7-8	8
	Reading Process	0-5	6-8	9-11	11
	Informational Text	0-6	7-9	10-16	16
	Literary Text	0-3	4-6	7-12	12
Grade 7 Mathematics	Number, Number Sense and Operations	0-4	5-7	8-10	10
	Measurement	0-2	3-5	6-10	10
	Geometry and Spatial Sense	0-2	3-6	7-10	10
	Patterns, Functions and Algebra	0-2	3-5	6-10	10
	Data Analysis and Probability	0-1	2-4	5-10	10
Grade 7 Writing	Not Tested in 2014				
Grade 8 Reading	Acquisition of Vocabulary	0-4	5-6	7-8	8
	Reading Process	0-6	7-9	10-12	12
	Informational Text	0-5	6-9	10-16	16
	Literary Text	0-3	4-7	8-12	12
Grade 8 Mathematics	Number, Number Sense and Operations	0-2	3-5	6-10	10
	Measurement	0-1	2-4	5-9	9
	Geometry and Spatial Sense	0-2	3-5	6-8	8
	Patterns, Functions and Algebra	0-2	3-5	6-10	10
	Data Analysis and Probability	0-3	4-6	7-9	9
Grade 8 Science	Physical Science	0-5	6-8	9-12	12
	Life Science	0-5	6-8	9-12	12
	Earth and Space Science	0-4	5-7	8-13	13
	Science and Technology	0-4	5-7	8-11	11
Grade 8 Social Studies	Not Tested in 2014				

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 2014 administration of the Ohio Achievement Assessments¹.

**Table 12 - Raw Score to Scaled Score Conversion Grades 3 and 4,
May 2014 Ohio Achievement Assessment Administration**

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject					
Raw Score	Grade 3		Grade 4		
	Reading	Math	Reading	Math	Writing
0	260	245	271	240	Not Tested in 2014
1	279	265	291	263	
2	297	285	311	287	
3	308	297	323	301	
4	317	306	332	312	
5	323	314	339	320	
6	329	320	345	327	
7	334	325	350	333	
8	338	330	355	339	
9	342	335	359	344	
10	345	339	363	349	
11	349	343	366	353	
12	352	347	370	357	
13	355	350	373	361	
14	358	354	376	365	
15	361	357	379	368	
16	363	360	382	372	
17	366	363	384	375	
18	368	367	387	378	
19	371	370	389	381	
20	373	373	392	384	
21	376	375	394	387	
22	378	378	397	390	
23	380	381	400	393	
24	382	384	401	396	
25	385	387	404	400	
26	387	389	406	402	
27	389	392	408	405	
28	391	395	411	407	
29	393	398	413	410	
30	395	400	416	413	

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 2014 Ohio Achievement Assessment Administration (continued)**

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject					
Raw Score	Grade 3		Grade 4		
	Reading	Math	Reading	Math	Writing
31	398	403	418	416	Not Tested in 2014
32	400	406	421	419	
33	402	409	423	422	
34	404	411	426	425	
35	406	414	429	428	
36	409	417	431	432	
37	411	420	435	434	
38	415	423	438	438	
39	417	426	441	441	
40	420	430	445	445	
41	423	433	449	449	
42	427	437	454	453	
43	432	441	459	457	
44	436	447	467	462	
45	442	450	472	467	
46	450	455	480	473	
47	460	460	493	480	
48	478	467	513	488	
49	496	474	533	498	
50		485		512	
51		504		535	
52		522		558	

**Table 13 - Raw Score to Scaled Score Conversion Grades 5 and 6,
May 2014 Ohio Achievement Assessment Administration**

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject						
Raw Score	Grade 5				Grade 6	
	Reading	Math	Science	Social Studies	Reading	Math
0	250	239	236	Not Tested in 2014	277	236
1	271	262	260		299	262
2	293	286	283		321	289
3	306	300	298		334	305
4	316	311	308		344	317
5	324	320	317		352	327
6	331	327	324		358	335
7	337	334	331		364	342
8	342	340	337		369	349
9	347	345	342		373	354
10	351	350	347		378	360
11	356	355	351		382	365
12	359	359	356		385	369
13	363	364	360		389	374
14	367	368	364		392	378
15	370	372	367		395	382
16	373	375	371		398	385
17	376	379	375		401	389
18	379	383	378		404	393
19	382	386	381		406	396
20	385	390	385		409	400
21	388	393	388		411	402
22	390	396	391		414	406
23	393	400	395		416	409
24	395	402	398		418	412
25	398	405	401		421	415
26	401	408	405		423	418
27	403	411	408		425	420
28	406	414	411		428	423
29	408	417	415		430	426
30	411	420	418	432	429	

**Table 13 - Raw Score to Scaled Score Conversion Grades 5 and 6,
May 2014 Ohio Achievement Assessment Administration (continued)**

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject						
Raw Score	Grade 5				Grade 6	
	Reading	Math	Science	Social Studies	Reading	Math
31	414	422	422	Not Tested in 2014	436	432
32	416	425	426		437	435
33	419	428	430		440	438
34	422	431	434		442	441
35	425	434	438		445	445
36	428	437	442		448	448
37	431	440	448		451	452
38	435	443	452		454	455
39	439	446	457		458	460
40	442	449	463		462	464
41	447	453	469		466	469
42	452	457	476		471	474
43	459	461	484		476	479
44	463	466	492		482	486
45	470	471	503		490	494
46	480	477	516		500	503
47	492	484	537		513	514
48	513	492	558		535	530
49	535	502			556	556
50		514				583
51		536				
52		557				

**Table 14 - Raw Score to Scaled Score Conversion Grades 7 and 8,
May 2014 Ohio Achievement Assessment Administration**

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject							
Raw Score	Grade 7			Grade 8			Social Studies
	Reading	Math	Writing	Reading	Math	Science	
0	269	277	Not Tested in 2014	262	282	255	Not Tested in 2014
1	290	299		284	302	278	
2	311	321		306	322	301	
3	324	335		319	334	315	
4	334	345		329	343	325	
5	341	353		337	351	333	
6	348	360		343	357	340	
7	354	365		349	363	346	
8	359	371		354	368	351	
9	363	375		359	373	356	
10	368	380		363	377	361	
11	372	384		367	381	365	
12	375	387		371	385	369	
13	379	391		374	389	372	
14	382	394		378	392	376	
15	386	398		381	396	379	
16	389	401		384	400	383	
17	392	404		387	402	386	
18	395	407		390	405	389	
19	398	409		393	408	392	
20	400	412		395	411	395	
21	403	415		398	414	398	
22	406	417		401	417	400	
23	409	420		403	420	403	
24	411	423		406	422	406	
25	414	425		408	425	409	
26	416	427		411	428	411	
27	419	430		413	430	414	
28	422	432		416	433	417	
29	424	436		418	435	419	
30	427	437	421	438	422		

**Table 14 - Raw Score to Scaled Score Conversion Grades 7 and 8,
May 2014 Ohio Achievement Assessment Administration (continued)**

Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject							
Raw Score	Grade 7			Grade 8			
	Reading	Math	Writing	Reading	Math	Science	Social Studies
31	430	439	Not Tested in 2014	423	441	425	Not Tested in 2014
32	432	442		426	444	428	
33	435	444		428	447	431	
34	438	447		431	450	434	
35	441	450		434	453	437	
36	444	452		437	456	440	
37	448	455		440	460	445	
38	452	458		443	464	447	
39	455	462		447	469	451	
40	459	465		451	474	455	
41	464	469		455	480	459	
42	470	473		460	487	465	
43	476	478		466	496	471	
44	485	483		474	508	478	
45	496	490		483	528	487	
46	516	497		496	547	500	
47	536	507		517		522	
48		520		539		544	
49		543					
50		565					
51							
52							