

Idaho State Department of Education
Tom Luna, State Superintendent



Idaho Standards Achievement Tests

Reading, Mathematics, and Language Usage
Grades 3-8, and 10

Science
Grades 5, 7, and 10

Scale Score to Percentile Rank Conversion Tables Spring 2011

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July 2011

Percentile Ranks

A **percentile rank** is the percentage of values in a set of scores that are lower than a certain value. Students at the percentile rank of 99 have scored higher than 99 percent of the students in the group (e.g., higher than 99 percent of the fourth graders with scores on the ISAT reading test, etc.). Likewise, students with a percentile rank of 56 scored higher than 56 percent of the students in the group, and those with a percentile rank of 24 scored higher than 24 percent of the students. Common English language descriptors for percentile-rank ranges include:

96-99	Very High
89-95	High
77-88	Above Average
60-76	High Average
41-59	Average for Grade Level
24-40	Low Average
12-23	Below Average
5-11	Low
1-4	Very Low

To find the percentile rank of a score, x , out of a set of n scores in which x is included:

$$\text{Percentile Rank} = \frac{(B + 0.5E)}{n} \times 100$$

Where B = number of scores below x ;
 E = number of scores equal to x ; and
 n = total number of scores.

Notes:

[1] Student scale scores based on only the **ISAT 2011 core items** were used to compute the percentile ranks displayed in these conversion tables.

[2] The total number of **students with valid ISAT scores** for each grade-level subject is displayed at the bottom of each conversion table. This total includes students from Idaho public schools and public charter schools, schools providing special services under contract (e.g., COSSA and Northwest Children's Home), schools run by the state (e.g., Idaho School for the Deaf and Blind, and the juvenile correction centers), as well as the Coeur d'Alene Tribal School and the Shoshone-Bannock Jr-Sr High School.

[3] Since percentile ranks are not on an equal interval scale, they **cannot be averaged using ordinary arithmetic**, nor can they be graphed as an equal interval scale using Excel. There are, however, mathematical techniques that can be used to find a composite (or average) percentile rank and tricks to make Excel appear to graph percentile ranks.

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Idaho Standards Achievement Tests (ISAT), Spring 2011
Scale Score to Percentile Rank, Grade 3

%tile	Reading	Mathematics	Language	Science
99	244 -	242 -	244 -	
98	232-243		232-243	
97				
96		229-241		
95			224-231	
94	225-231			
93				
92				
91			220-223	
90				
89		222-228		
88	220-224			
87				
86			216-219	
85				
84				
83				
82	217-219			
81		217-221	214-215	
80				
79				
78				
77				
76				
75			211-213	
74	214-216			
73				
72		214-216		
71				
70				
69			209-210	
68				
67	212-213			
66				
65				
64		211-213	208	
63				
62				
61	210-211			
60				
59				
58		208-210	206-207	
57				
56				
55	208-209			
54				
53			204-205	
52				
51		206-207		
50	207			

%tile	Reading	Mathematics	Language	Science
49				
48			203	
47				
46		204-205		
45	205-206			
44			202	
43				
42				
41		203		
40	204		200-201	
39				
38				
37				
36		201-202	199	
35	202-203			
34				
33				
32	201	200	198	
31				
30				
29			197	
28	200	198-199		
27				
26			195-196	
25	199	197		
24				
23			194	
22	198	195-196		
21				
20	197		193	
19		194		
18	195-196		192	
17		193		
16	194		191	
15		192		
14	193		190	
13		190-191		
12	192		188-189	
11		189		
10	191		187	
9	190	188		
8	189	187	186	
7		186	185	
6	188	184-185		
5	187	183	184	
4	185-186	182	182-183	
3	184	181	181	
2	181-183	178-180	180	
1	1-180	1-177	1-179	
N	21,637	21,664	21,631	0

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Idaho Standards Achievement Tests (ISAT), Spring 2011
Scale Score to Percentile Rank, Grade 4

%tile	Reading	Mathematics	Language	Science
99	252 -	253 -	252 -	
98	240-251	240-252		
97			239-251	
96				
95	233-239	233-239		
94				
93			232-238	
92				
91	228-232	228-232		
90				
89				
88				
87			227-231	
86	225-227			
85		225-227		
84				
83				
82				
81			224-226	
80				
79	222-224			
78		222-224		
77				
76				
75				
74			221-223	
73	220-221			
72		219-221		
71				
70				
69				
68				
67	218-219		219-220	
66		217-218		
65				
64				
63				
62	216-217			
61			217-218	
60				
59		215-216		
58				
57				
56	214-15			
55				
54			215-216	
53		213-214		
52				
51	212-213			
50				

%tile	Reading	Mathematics	Language	Science
49			213-214	
48		212		
47				
46	211			
45				
44				
43		210-211	212	
42	210			
41				
40				
39			210-211	
38	208-209	209		
37				
36				
35				
34	207	207-208	209	
33				
32				
31	206		207-208	
30		206		
29				
28				
27	204-205	205	206	
26				
25				
24	203	204	205	
23				
22	202			
21		202-203	204	
20				
19	201	201		
18			202-203	
17	200			
16		200	201	
15	199			
14		199	200	
13	197-198			
12		198	199	
11	196		198	
10	195	197		
9		195-196	197	
8	194		195-196	
7	193	194		
6		193	194	
5	191-192	192	193	
4	190	190-191	192	
3	189	189	191	
2	187-188	188	188-190	
1	1-186	1-187	1-187	
N	21,586	21,616	21,580	0

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Idaho Standards Achievement Tests (ISAT), Spring 2011
Scale Score to Percentile Rank, Grade 5

%tile	Reading	Mathematics	Language	Science
99	257 -	250 -	257 -	241 -
98	245-256		245-256	233-240
97				
96		243-249	237-244	229-232
95	237-244			
94				
93		238-242		225-228
92			233-236	
91				
90				
89	233-236	235-237		223-224
88				
87			230-232	
86				
85				221-222
84		232-234		
83	229-232			
82				
81			227-229	
80				219-220
79		230-231		
78				
77				
76	227-228		225-226	
75				217-218
74		227-229		
73				
72				
71				
70			223-224	215-216
69	224-226			
68		226		
67				
66				
65				214
64			221-222	
63	222-223	224-225		
62				
61				
60				
59			219-220	212-213
58		222-223		
57				
56	221			
55				
54			218	211
53		221		
52				
51	219-220			
50				

%tile	Reading	Mathematics	Language	Science
49				210
48		220	216-217	
47				
46	217-218			
45				208-209
44				
43		218-219	215	
42				
41	216			
40				207
39		217	214	
38				
37	215			
36				206
35		216		
34			212-213	
33	213-214			
32				205
31		215	211	
30				
29	212			
28		213-214		204
27			210	
26	211			
25		212		202-203
24	210		209	
23				
22				201
21	209	211	208	
20				
19	207-208	210		200
18			207	
17	206			
16		209	206	199
15	205			
14		208	205	198
13	204			
12		207	204	
11	203	206		197
10	202		203	
9	201	205	201-202	196
8	200			195
7	199	204	200	
6	197-198	203	199	193-194
5	196	202	198	
4	195	201	197	192
3	194	200	196	191
2	192-193	198-199	193-195	190
1	1-191	1-197	1-192	1-189
N	21,339	21,356	21,346	21,350

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Idaho Standards Achievement Tests (ISAT), Spring 2011
Scale Score to Percentile Rank, Grade 6

%tile	Reading	Mathematics	Language	Science
99	248 -	270 -	250 -	
98		258-269		
97			242-249	
96	241-247			
95		250-257		
94				
93			238-241	
92	236-240	246-249		
91				
90				
89			234-237	
88		242-245		
87	233-235			
86				
85				
84			232-233	
83		240-241		
82				
81				
80	230-232			
79		237-239	229-231	
78				
77				
76				
75				
74	228-229	235-236		
73			227-228	
72				
71				
70		234		
69				
68				
67	226-227		226	
66				
65		232-233		
64				
63				
62				
61		230-231	224-225	
60	224-225			
59				
58				
57		229		
56				
55			222-223	
54	222-223			
53				
52		228		
51				
50			221	

%tile	Reading	Mathematics	Language	Science
49	221	226-227		
48				
47				
46				
45		225	219-220	
44				
43	219-220			
42				
41		224		
40			218	
39				
38	218	223		
37				
36				
35			217	
34	216-217	222		
33				
32				
31		221	216	
30	215			
29				
28		219-220	215	
27			214	
26	214			
25		218		
24			213	
23	213			
22		217		
21			212	
20	211-212			
19		216		
18	210		211	
17		215		
16			210	
15	209	214		
14			209	
13	208	213		
12			208	
11	207	212		
10	206		207	
9		211		
8	205		206	
7	204	210	204-205	
6	203	209	203	
5	201-202	208	202	
4	200	207	201	
3	199	205-206	200	
2	196-198	204	198-199	
1	1-195	1-203	1-197	
N	21,351	21,356	21,348	0

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Idaho Standards Achievement Tests (ISAT), Spring 2011
Scale Score to Percentile Rank, Grade 7

%tile	Reading	Mathematics	Language	Science
99	263 -	263 -	254 -	240 -
98	251-262			235-239
97		256-262	246-253	
96				232-234
95	243-250	251-255		
94			242-245	230-231
93				
92				
91		247-250		228-229
90			239-241	
89	239-242			
88		245-246		
87				226-227
86				
85			236-238	
84		242-244		224-225
83	236-238			
82				
81			234-235	
80				
79		240-241		223
78				
77				
76	233-235		232-233	
75				221-222
74		238-239		
73				
72				
71			230-231	220
70		237		
69	231-232			
68				
67				219
66			229	
65		235-236		
64				
63	229-230			
62				217-218
61		234	227-228	
60				
59				
58				216
57			226	
56	227-228	232-233		
55				
54				215
53				
52		231	224-225	
51				
50	225-226			214

%tile	Reading	Mathematics	Language	Science
49				
48		230	223	
47				
46				213
45	224			
44		229	222	
43				
42				212
41		227-228		
40	223		221	
39				211
38				
37		226		
36	221-222		220	
35				210
34		225		
33				
32	220		219	209
31		224		
30				
29			218	208
28	219	223		
27				
26			217	207
25	218	222		
24				
23		221	216	
22	217			
21			215	206
20	215-216	220		
19				
18		219	214	205
17	214			
16		218	213	204
15	213			
14		217	212	
13	212			203
12	211	216	211	
11				202
10	210	215	210	
9	209	214		201
8	208		209	
7	207	213	208	200
6	206	211-212		199
5	205	210	207	
4	204		206	198
3	203	209	204-205	197
2	201-202	206-208	203	195-196
1	1-200	1-205	1-202	1-194
N	20,840	20,866	20,843	20,829

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Idaho Standards Achievement Tests (ISAT), Spring 2011
Scale Score to Percentile Rank, Grade 8

%tile	Reading	Mathematics	Language	Science
99	268 -	281 -	258 -	
98	256-267	269-280	251-257	
97				
96				
95		261-268	246-250	
94	249-255			
93				
92		257-260	243-245	
91				
90				
89		254-256		
88	244-248		240-242	
87				
86				
85		251-253		
84			238-239	
83				
82				
81	241-243	249-250		
80			236-237	
79				
78				
77				
76		247-248		
75	238-240		234-235	
74				
73				
72		245-246		
71				
70			233	
69				
68	236-237	243-244		
67				
66				
65			231-232	
64		242		
63				
62	234-235			
61			230	
60				
59		240-241		
58				
57				
56	232-233		228-229	
55		239		
54				
53				
52			227	
51		238		
50	231			

%tile	Reading	Mathematics	Language	Science
49				
48				
47		237	226	
46				
45	229-230			
44				
43		236	225	
42				
41				
40	228			
39		234-235	224	
38				
37				
36	227	233		
35			223	
34				
33				
32	225-226	232	221-222	
31				
30				
29		231		
28	224		220	
27				
26		230		
25	223		219	
24				
23		229		
22	222		218	
21				
20	221	228	217	
19				
18		227		
17	220		216	
16				
15	218-219	226	215	
14				
13	217	225	214	
12				
11	216	224		
10	215	223	213	
9			212	
8	214	222		
7	213		211	
6	212	221	210	
5	211	220		
4	210	218-219	209	
3	209	217	208	
2	207-208	216	205-207	
1	1-206	1-215	1-204	
N	20,407	20,411	20,397	0

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Idaho Standards Achievement Tests (ISAT), Spring 2011
Scale Score to Percentile Rank, Grade 10

%tile	Reading	Mathematics	Language	Science
99	260 -	288 -	264 -	255 -
98				248-254
97	253-259		256-263	
96		275-287		
95			252-255	244-247
94	248-252			
93				
92		268-274		241-243
91			248-251	
90	245-247			
89				238-240
88				
87		263-267	246-247	
86				
85	242-244			236-237
84				
83			243-245	
82		260-262		
81				234-235
80				
79	240-241		241-242	
78				
77		257-259		232-233
76				
75				
74			239-240	
73	238-239			
72		255-256		231
71				
70				
69			238	
68		253-254		230
67				
66	236-237			
65			236-237	
64		251-252		228-229
63				
62				
61				
60	235		235	227
59		250		
58				
57				
56				226
55		248-249	233-234	
54	233-234			
53				225
52				
51		247	232	
50				

%tile	Reading	Mathematics	Language	Science
49				224
48	232			
47		246		
46			231	223
45				
44				
43	230-231	244-245		
42			229-230	222
41				
40				
39		243		221
38	229		228	
37				
36				220
35		242		
34			227	
33	228			219
32		241		
31				
30	227		226	218
29		240		
28				217
27			225	
26	225-226	239		216
25				
24		238	224	
23	224			215
22				
21		236-237	223	214
20	223			
19		235		
18	222		222	
17		234		213
16	221		221	
15		233		212
14	220	232	220	
13				211
12	219	231	218-219	210
11	218			
10		230	217	209
9	217	229	216	208
8	216	228		
7	215	227	215	207
6	214	226	214	206
5	213	225	213	205
4	211-212	223-224	212	
3	209-210	222	211	204
2	208	221	209-210	203
1	1-207	1-220	1-208	1-202
N	19,699	19,722	19,693	19,561

ISAT Cut-Scores and ISAT Percentile Ranks

In 2007, Idaho implemented the current version of the *Idaho Standards Achievement Tests* (ISAT) -- a criterion-referenced test -- to comply with requirements of the *No Child Left Behind Act* (NCLB). Idaho used the norm-referenced *Iowa Test of Basic Skills* (ITBS) as the state test for several years before adopting the ISAT.

A cut-score is a criterion-referenced statistic. The percentile rank is a norm-referenced statistic. There is no reason to compare the two statistics or to use one to explain the other. Such comparisons will likely lead to incorrect conclusions.

ISAT Criterion-Referenced Statistic. NCLB required states to establish content standards for each grade level and to assess students with at-grade-level tests. NCLB further required states set a criterion score (i.e., a cut-score) for each of its grade-level tests such that students who score at or above the cut-score are said to be *meeting grade-level expectations*. The State Board of Education named the cut-scores indicating that the student met grade-level expectation as *proficient*. It also set cut-scores for *advanced*, *basic* and *below basic* that described student performance that was above or below proficient. The Board engaged Idaho educators and citizens to develop and recommend the performance standards (i.e., the cut-scores).

ISAT Norm-Referenced Statistic. Idaho's *gifted and talented program*, which serves students scoring at the 90th to 95th percentile or better on one or more standardized tests (i.e., the top 5 to 10 percent of students), requested that percentile ranks be published for ISAT. Thus, separate scale score to percentile rank conversion tables have been generated for the spring 2007, 2008, 2009, 2010, and 2011 assessments. The conversion tables display *Idaho percentile ranks* for all valid scale scores reported by DRC (e.g., the ISAT vendor). Only scale scores from students who were tested under standard ISAT conditions were included in the percentile rank calculations. The cut-scores for reading, mathematics, language usage, and science and their associated percentile ranks are listed below in Table 1 for grades 3, 7 and 10.

If Idaho had used ISAT percentiles in 2007 to set cut-scores, we would likely have set the 41st percentile as *proficient*. Indeed, on norm-referenced tests, percentiles from 41 to 59 define *average grade-level performance*. NCLB, however, required the State Board of Education to use generally a recognized standard-setting process such as the *bookmark method*. With this method, items of a test (say, grade 3 mathematics) were presented to a panel in order of difficulty from least difficult to most difficult. The panel decided whether the item was one that students meeting grade 3 expectations would answer correctly most of the time. If so, the panel went on to the next item, then on to the next, until the answer was "no." *Bookmarks* were inserted between the last "yes" and first "no" items. The items identified via bookmarking were used to define the proficiency level (i.e., scale cut-score) for grade 3 mathematics.

Table 1. Proficient cut-scores and percentile ranks for proficient cut-scores on the Idaho Standards Achievement Tests (ISAT) of reading, mathematics, language usage and science for grades 3, 7, and 10 from 2007 through 2010.

Grade 3	Proficient	2007	2008	2009	2010	2011
Reading	192	<u>36</u>	18	14	12	12
Mathematics	190	<u>40</u>	13	14	13	13
Language Usage	196	<u>49</u>	30	27	27	18
Grade 7	Proficient	2007	2008	2009	2010	2011
Reading	212	<u>27</u>	20	15	13	13
Mathematics	223	<u>35</u>	26	25	25	28
Language Usage	218	<u>47</u>	32	29	27	29
Science	213	NA	<u>49</u>	45	47	46
Grade 10	Proficient	2007	2008	2009	2010	2011
Reading	220	<u>25</u>	15	NA	14	14
Mathematics	238	<u>40</u>	24	NA	24	24
Language Usage	226	<u>52</u>	32	NA	29	30
Science	219	NA	<u>34</u>	32	33	33

The State Board of Education, with educator and citizen involvement, established *proficient* cut-scores as listed in Table 1. Percentile ranks were calculated using all valid ISAT scores from 2007 for reading, mathematics and language usage and from science in 2008. This first percentile rank for each grade level test may be considered “grade-level norms” for the current version of ISAT. They are similar to publisher’s percentile ranks from various standardized, norm-referenced tests.

A low percentile rank on a norm-referenced test, for sure, represents a low performance relative to the norm group. A low percentile rank for an established cut-score, however, does not necessarily mean that the Board’s cut-score represents a *low* performance standard. Indeed, as more and more students meet or exceed NCLB grade-level expectations over time, the percentile rank for the *proficient* cut-score decreases. If all students scored *at or above* the cut-score, the cut-score’s percentile rank would be 1. If all students scored *below* the cut-score, the cut-score’s percentile rank would be 99.

In 2007, for example, 64 percent of Idaho’s grade 3 students exhibited grade-level knowledge and skills in reading, which placed the cut-score at the 36th percentile. In 2011, 88 percent of Idaho’s grade 3 students exhibited the requisite amount of knowledge and skills in reading, which lowered the percentile rank for the cut-score to 12. Nothing in this example indicates whether the cut-score was high or low, rigorous or easy. Indeed, the cut-score remained constant while student knowledge and skills increased.

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