



Iowa Testing Programs

Technical Summary for Form F of the Iowa Assessments

ITP Research Series

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Iowa Testing Programs endorses the *Code of Fair Testing Practices in Education* and the *Code of Professional Responsibilities in Educational Measurement*, guides to the conduct of those involved in educational testing.

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Description of the 2017 Norming Process

The *Iowa Assessments*, Forms E, F and G comprise the most current edition of an achievement test series developed by the University of Iowa. The assessments measure student achievement in reading, mathematics, language, science, and social studies. Results of the *Iowa Assessments* are reported in several metrics designed to support a variety of interpretations including growth and relative comparisons. The National Percentile Rank (NPR) metric indicates the status or relative rank of a student's achievement compared with that of a nationally representative sample of students. This metric makes it possible to chart educational progress over time, providing a basis for examining changes in national performance. The most recent NPRs for the *Iowa Assessments* are based on studies conducted in 2011 through 2017 in which national samples of public and private school students were assessed in all content areas. As a result, information from the *Iowa Assessments* allows educators and parents to compare individual students or groups of students to the most current estimate of national performance available.

The procedure used to obtain 2017 norms for the *Iowa Assessments* was designed to yield up-to-date normative interpretations of test performance that closely reflect the performance that would be expected from participants in a national standardization in the years after the standardization took place. Important components of the process are the selection and weighing of schools that are used to determine the average degree of change in performance over time, and the method used to estimate change.

The target population for establishing 2017 norms was that set of school districts across the United States with regular patterns of testing beginning in the fall of 2011. A "regular pattern of testing" means administration of the *Iowa Assessments* in two consecutive years at a common set of grade levels. Schools that did not have at least two consecutive years of test data, or that tested in one set of grades one year and another set the following year, were not included in the analyses on which 2017 norms were based.

After schools that satisfied the criteria for selection were identified, sampling weights were determined by assigning each district a nominal weight of 3 and then up-weighting or down-weighting systematically until the difference between the weighted sample and the population targets were minimized. The weighted distributions of student records matched the targets set from the 2015-2016 Common Core of Data (CCD, National Center for Education Statistics, downloaded from <https://nces.ed.gov/ccd/>) for the 2017 national norms in terms of the principal stratification variables, that is, geographic region, Title I status and district size. The states that belong to each geographic region are provided below.

Northeast	(CT, ME, NH, RI, VT, NJ, NY, PA, MA)
Midwest	(IL, IN, MI, OH, WI, IA, KS, MN, MO, NE, ND, SD)
South	(DE, DC, FL, GA, MD, NC, SC, VA, WV, AL, KY, MS, TN, AR, LA, OK, TX)
West	(AZ, CO, ID, MT, NV, NM, UT, WY, AK, CA, HI, OR, WA)

The representation of students in the public and private school population described above was proportional to the representation of districts in the 2011 national standardization population. These percentages are reported in Table 1, which reflects the fact that sampling weights were established for the private school portion of the norming samples separately so that the percentages of private school students matched the population targets. The complete results of the weighting procedures are provided in Tables 2, 3 and 4 for the public school portion of the norming samples. Information for the private school samples are provided in Tables 5.

Table 1: Percentage of Students by Type of School, Grades 1–12
Iowa Assessments Form E
Fall 2017 National Comparison Study

Type of School	Percentage in Weighted Sample	Percentage in Population*
Public Schools	90.0	91.7
Catholic Schools	4.4	3.9
Private (Non-Catholic) Schools	5.6	4.4
Total	100.0	100.0

*Totals may not equal 100.0 due to rounding.

Table 2: Percentage of Public School Students by Geographic Region, Grades 1–12
Iowa Assessments Form E
Fall 2017 National Comparison Study

Geographic Region	Percentage in Weighted Sample	Percentage in Population*
Northeast	16.7	16.4
Midwest	26.8	21.2
South	32.4	37.7
West	24.1	24.9

*Totals may not equal 100.0 due to rounding.

Table 3: Percentage of Public School Students by Title I Status, Grades 1–12
Iowa Assessments Form E
Fall 2017 National Comparison Study

Title I Status	Percentage in Weighted Sample	Percentage in Population*
Title I (Schoolwide)	55.1	55.5
Title I (Non- Schoolwide)	12.0	15.7
Non-Title I	32.9	27.8

*Totals may not equal 100.0 due to rounding.

Table 4: Percentage of Public School Students by District Enrollment, Grades 1–12
Iowa Assessments Form E
Fall 2017 National Comparison Study

District K–12 Enrollment	Percentage in Weighted Sample	Percentage in Population*
50,000–100,000+	23.9	18.3
25,000–49,999	13.2	13.6
10,000–24,999	24.3	18.6
5,000–9,999	4.1	14.8
2,500–4,999	4.8	14.3
1,200–2,499	5.1	9.7
600–1,199	4.0	5.8
Less than 600	20.6	4.8

*Totals may not equal 100.0 due to rounding.

**Table 5: Percentage of Catholic School and Private (Non-Catholic) School Students
by Geographic Region, Grades 1–12
Iowa Assessments Form E
Fall 2017 National Comparison Study**

Catholic

Geographic Region	Percentage in Weighted Sample	Percentage in Population*
Northeast	24.8	28.1
Midwest	24.9	33.0
South	24.3	22.5
West	26.0	16.3

*Totals may not equal 100.0 due to rounding.

Private (Non-Catholic)

Geographic Region	Percentage in Weighted Sample	Percentage in Population*
Northeast	23.5	20.0
Midwest	21.8	16.9
South	24.6	41.3
West	30.8	21.8

*Totals may not equal 100.0 due to rounding.

Participation of Students in Groups of Interest

The records of students used to develop the 2017 norms for the *Iowa Assessments* included students with disabilities, English language learners, students from a variety of socio-economic and racial/ethnic groups. Although these groups were not a formal part of the stratification design, their representation in the data used to develop 2017 norms is of interest. Such characteristics of the sample are summarized in Table 6. In general, the differences between population and sample percentages are small. They are partly attributed to the fact that the population values are for public school students only, whereas about 10% of the students in the weighted sample are from Catholic and other private schools.

As part of the standard administrative conditions for the *Iowa Assessments*, schools are given detailed instructions on testing students with disabilities and English Language Learners consistent with the conditions used in the national standardization program. Schools identify all students so classified, decide whether they should participate in the assessment, and if so, whether modifications in testing procedures were needed.

In both the national standardization and in the administrations used in to develop the 2017 norms, among students with disabilities nearly all are identified as eligible for special education services and have an Individualized Education Program (IEP), an Individualized Accommodation Plan (IAP), or a Section 504 Plan. Schools examine the IEP or other plan for these students, decide whether the student should receive accommodations, and determine the nature of those accommodations. These steps are part of the regular administrative procedures for the *Iowa Assessments*.

For students whose native language is not English and who have been in an English-only classroom for a limited time, two decisions are made prior to administering the assessment. First, is English-language acquisition developed sufficiently to warrant participation, and second, should the assessment involve the use of any particular accommodations? In all instances, the guidelines in place in the school district are implemented in making decisions about each student, and these decisions are part of the standard administrative conditions for the *Iowa Assessments*.

Although not a direct part of a typical sampling plan, the ethnic and racial composition of a national sample should represent that of the school population. The racial-ethnic composition of the 2017 norming data was based on responses to demographic questions on answer documents. In all grades, students were asked to indicate their ethnicity as Hispanic or Non-Hispanic. A separate entry was provided in which students were told to indicate the racial group defined by the 2010 U.S. Census to which they belong. In kindergarten through grade 3, teachers furnished this information. In the remaining grades, students furnished it.

Table 6 also summarizes racial-ethnic representation in the weighted kindergarten through grade 11 sample. The differences between the weighted sample and population percents are

generally small. They are partly attributed to the fact that the population values are for public school students only, whereas about 10% of the students in the weighted sample are from Catholic and other private schools. Note that the percents in the categories for race sum to the percent of students who indicated they were not Hispanic or Latino.

**Table 6: Participation of Students by Education Plan and Ethnicity/Race
Iowa Assessments Form E, Grades 1–11
Fall 2017 National Comparison Study**

Education Plan	Population Percent¹	Weighted Sample Percent²
Individual Education Plan	13.0	5.4
504 Plan	1.2	0.7
English Language Learner	9.4	8.1
Free- and Reduced Price Lunch	48.1	31.4
Ethnicity	Population Percent¹	Weighted Sample Percent²
Hispanic or Latino	22.2	22.3
Not Hispanic or Latino	77.8	77.7
Race		
American Indian or Alaska Native	1.3	1.9
Asian	4.9	3.1
Black or African American	16.9	13.4
Native Hawaiian or Other Pacific Islander	0.1	.6
White	54.6	58.7

¹Public schools only, *NCES Common Core of Data, School Year 20015-16*.

²The weighted sample includes Catholic and other private schools.

Summary of the 2017 Norms Development Process

The weighted sample yielded a set of frequency distributions for each test in each of the two-year periods (five two-year periods in all) over which the degree of change was estimated across all percentiles from one year to the next. Differences in matched pairs of consecutive years were summarized at the 10th, 25th, 50th, 75th and 90th percentiles, and the average change for each pair of school years was aggregated across the five two-year periods. These differences were plotted and smoothed in order to establish the cumulative change in performance observed since the 2011 national standardization.

The 2017 norms derived from this procedure minimize any undue influence of a particular user or group of users in two important ways. First, the weighted frequency distributions of raw scores were not themselves used to define updated norms, as is typically done to derive “user norms.” They were only used to estimate the amount of change observed across the score distributions. This approach is preferable, assuming no interaction exists between the characteristics that distinguish users of the tests from nonusers. Second, it preserves the essential characteristics and representativeness of the original national probability sample.

Comparisons of 2011 and 2017 National Norms

Table 7 compares the percentile ranks from the 2017 national norms with those from the 2011 national norms for reading, math, science, social studies, and language. Only selected percentiles (10, 25, 50, 75 and 90) are shown in each table as a means of describing the general trend of score changes due to changes in national performance. The left column shows the selected percentiles for the given base year (2011). The remaining columns show the associated percentile ranks for the 2017 norms.

To determine how a grade 3 student who was at the 90th percentile on the reading test using the 2011 norms would have scored using the 2017 norms, go to the row labeled 90 and then read across to find the corresponding PR in grade 3. In this example, a student who scored at the 90th percentile on the reading test based on the 2011 norms would have received an NPR of 91 using the 2017 norms. As another example, a student in grade 3 who received an NPR of 50 on the mathematics test with the 2011 norms would have received an NPR of 58 using the 2017 norms. A comparison of the 2011 to 2017 national norms can be used to make the following general observations for grades 3 to 8:

- In general, the differences between the 2017 norms and the 2011 norms are small.
- The 2017 norms are most often somewhat “easier” than the 2011 norms, meaning that for a given level of performance based on 2011 norms, students are likely to receive slightly higher NPRs based on 2017 norms. This trend indicates that when systematic changes were observed between 2011 and 2017, student performance tended to go down. When the 2017 value is higher than the 2011 value, the newer norms are sometimes said to be “easier.”
- In reading, the average student (NPR = 50) in 2011 outperformed the average student in 2017 in grades 3 to 8. This is true for the other achievement levels as well.

- In math, students at all achievement levels (low, average, and high) in 2011 in grades 3 to 8 outperformed students in 2017.
- In science, student performance in 2011 and 2017 was very similar.
- In social studies and language, students in 2011 outperformed students in 2017 in grades 3 to 8.

For grades 9 to 11, performance of all students in 2017 was generally comparable to that of students in 2011. In addition, there were no significant differences in student performance in kindergarten through grade 2 in any subject area.

Figures 1 to 30 illustrate the impact of the changes in performance across the entire distribution in the years since 2011 in five subject area for grades 3 through 8. Notice that the red line indicating the 2017 norms is generally to the left of the 2011 norms, consistent with the norms getting “easier.” Larger differences are generally seen in the middle elementary grades and at the lower end of the standard score distribution. To find the percentile rank for the alternate set of norms, find where the student’s standard score on the horizontal axis intersects with the desired norm curve and read the NPR from the vertical axis.

Table 7: Comparison of the 2011 and 2017 National Norms, Grades 1–11

Reading		<u>Corresponding 2017 NPRs</u>										
Achievement Level in 2011	Grade											
	1	2	3	4	5	6	7	8	9	10	11	
90	90	90	91	91	91	91	91	91	90	90	90	
75	75	75	78	77	77	77	77	77	75	75	75	
50	50	50	54	53	53	53	52	52	50	50	50	
25	25	25	28	27	27	26	27	27	25	25	25	
10	10	10	12	12	11	12	11	11	10	10	10	
Math		Grade										
Achievement Level in 2011	Grade											
	1	2	3	4	5	6	7	8	9	10	11	
90	90	90	93	92	92	92	92	92	90	90	90	
75	75	75	80	79	78	78	78	78	75	75	75	
50	50	50	58	55	54	54	54	53	50	50	50	
25	25	25	29	30	29	28	28	28	25	25	25	
10	10	10	14	13	13	12	12	12	10	10	10	
Science		Grade										
Achievement Level in 2011	Grade											
	1	2	3	4	5	6	7	8	9	10	11	
90	90	90	90	90	91	90	90	90	90	90	90	
75	75	75	76	76	76	76	76	76	75	75	75	
50	50	50	52	51	51	51	52	51	50	50	50	
25	25	25	28	26	27	26	26	26	25	25	25	
10	10	10	11	11	11	10	11	10	10	10	10	
Social Studies		Grade										
Achievement Level in 2011	Grade											
	1	2	3	4	5	6	7	8	9	10	11	
90	90	90	92	92	91	91	91	91	90	90	90	
75	75	75	78	78	77	77	77	76	75	75	75	
50	50	50	54	53	53	52	52	52	50	50	50	
25	25	25	28	27	27	27	27	26	25	25	25	
10	10	10	12	12	11	11	11	11	10	10	10	
Language		Grade										
Achievement Level in 2011	Grade											
	1	2	3	4	5	6	7	8	9	10	11	
90	90	90	92	92	91	91	91	91	90	90	90	
75	75	75	78	77	77	76	77	77	75	75	75	
50	50	50	56	55	53	52	52	52	50	50	50	
25	25	25	29	29	28	28	27	27	25	25	25	
10	10	10	14	12	11	11	11	11	10	10	10	

Figure 1
Grade 3 - Reading

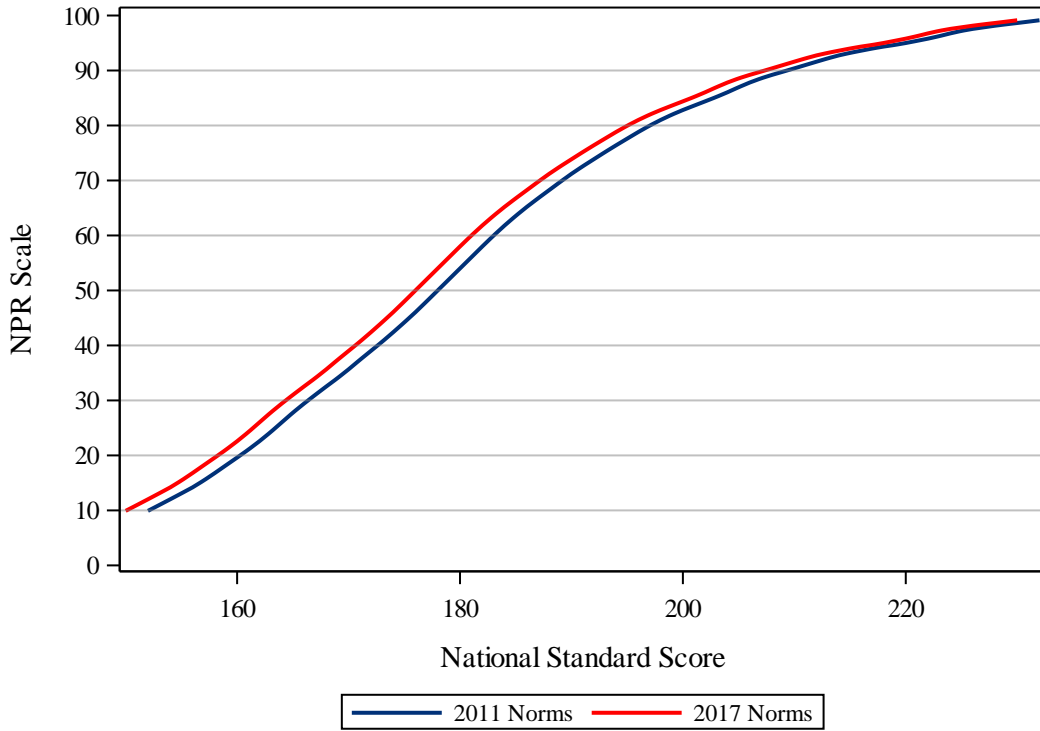


Figure 2
Grade 4 - Reading

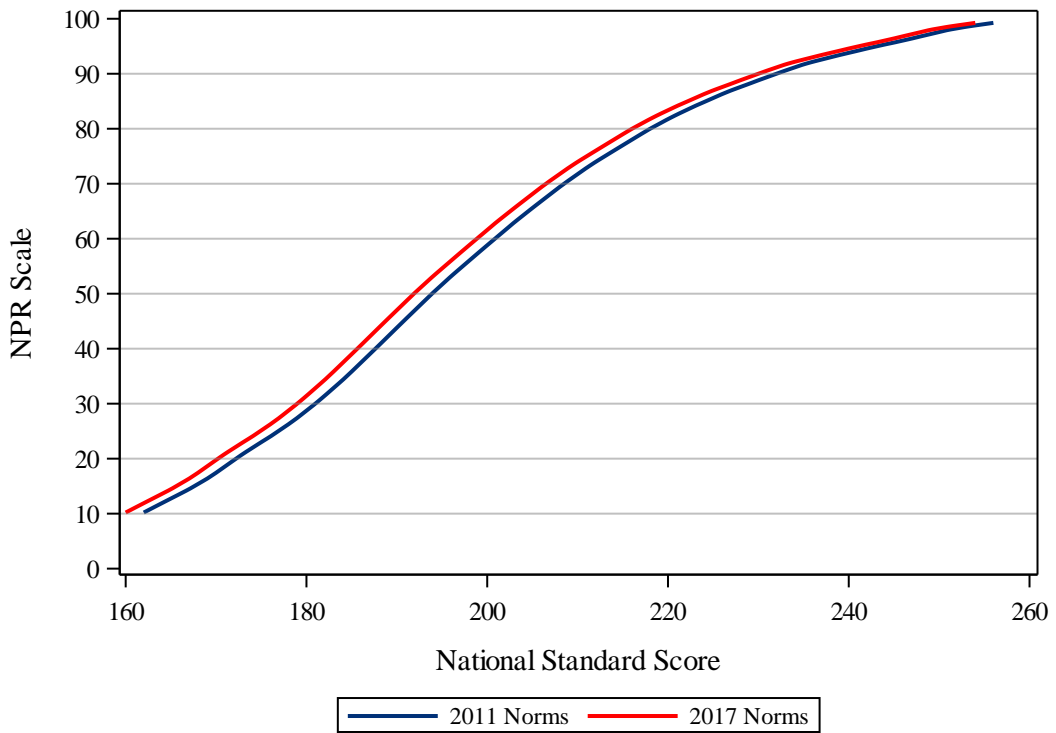


Figure 3
Grade 5 - Reading

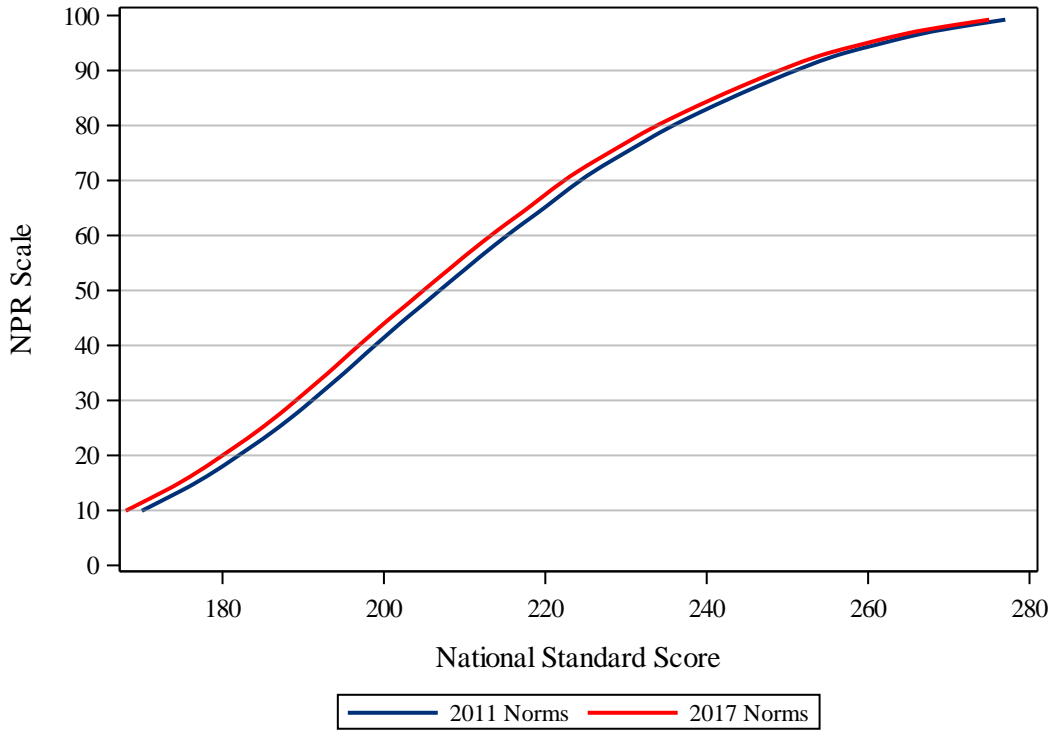


Figure 4
Grade 6 - Reading

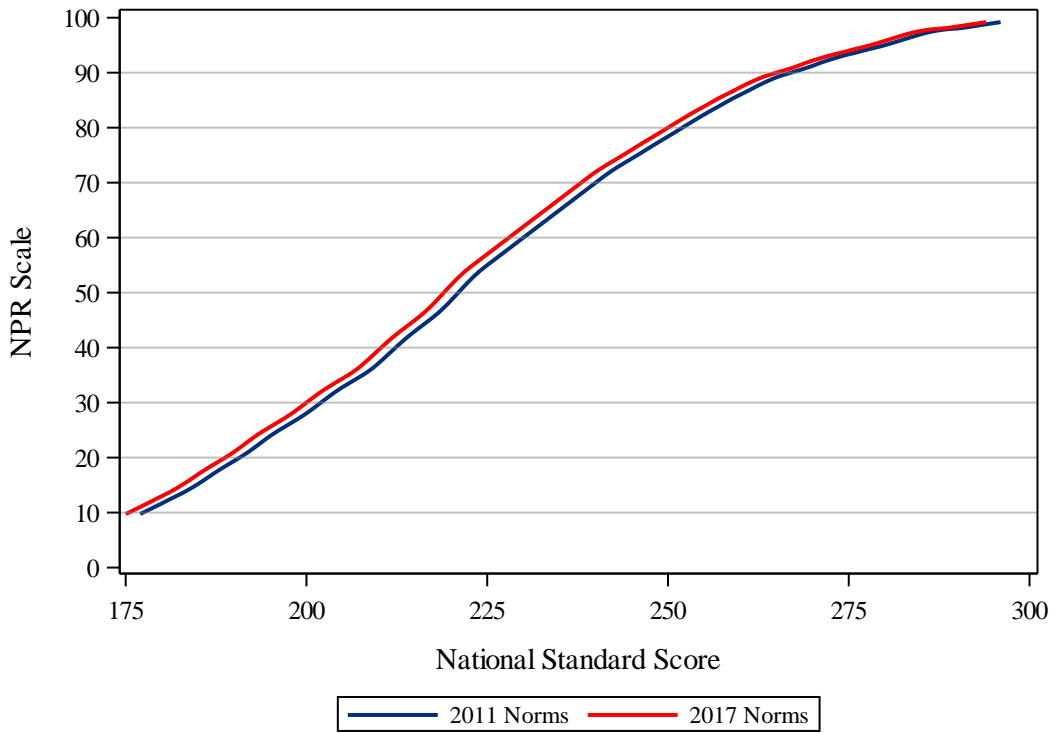


Figure 5
Grade 7 - Reading

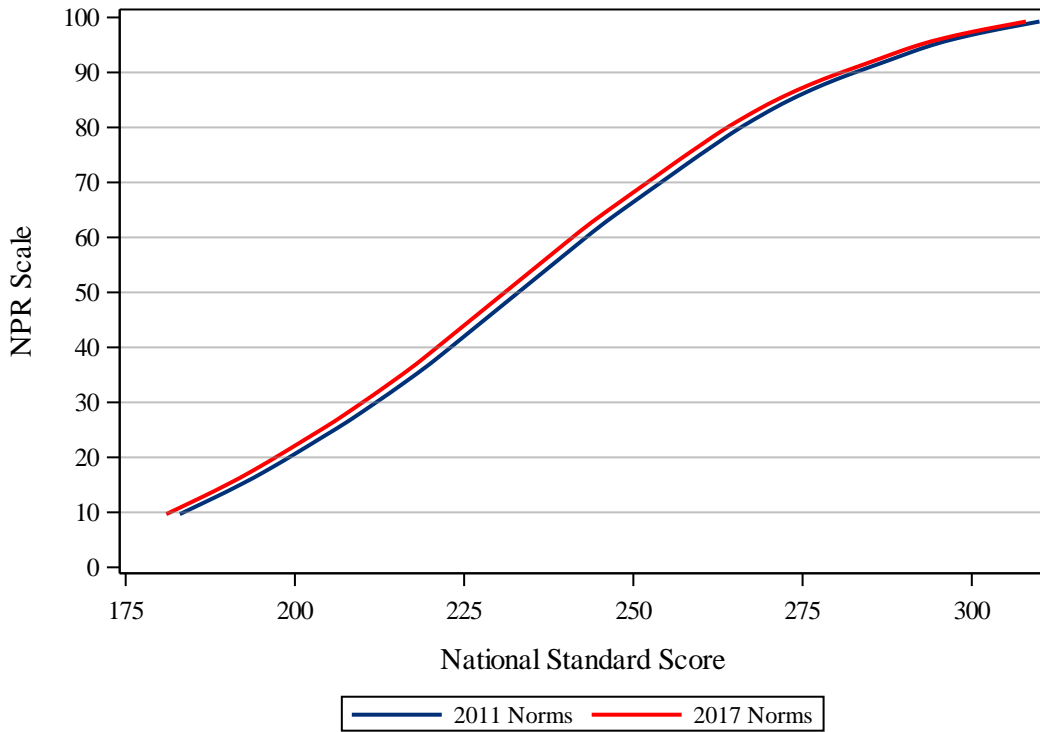


Figure 6
Grade 8 - Reading

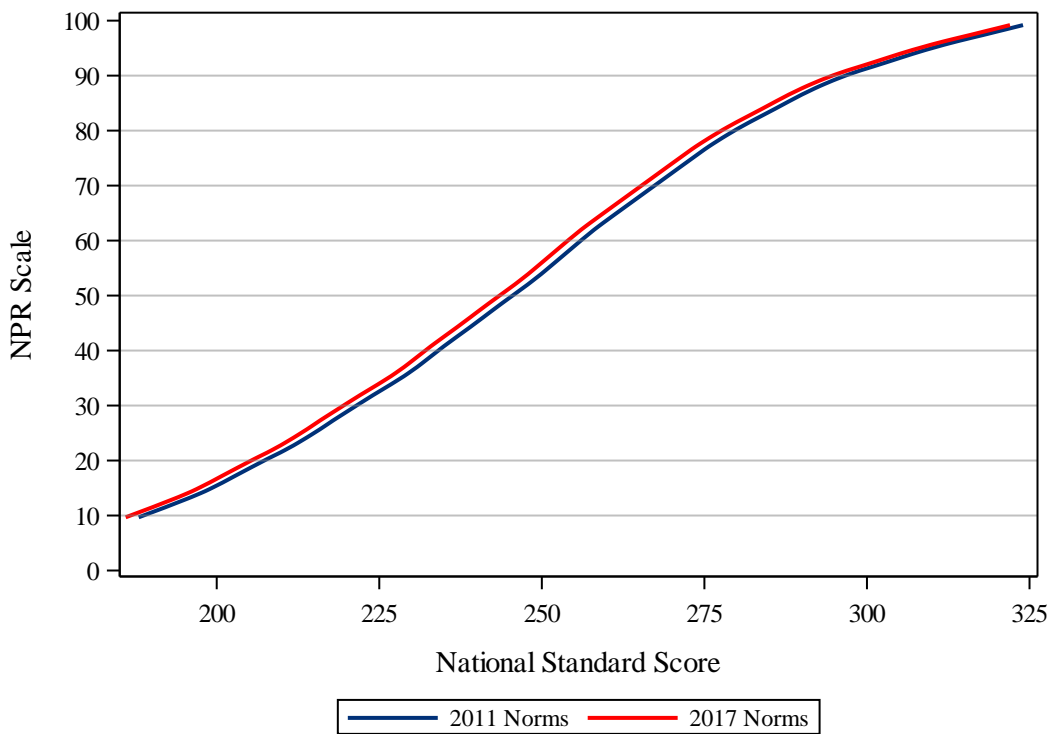


Figure 7
Grade 3 - Math

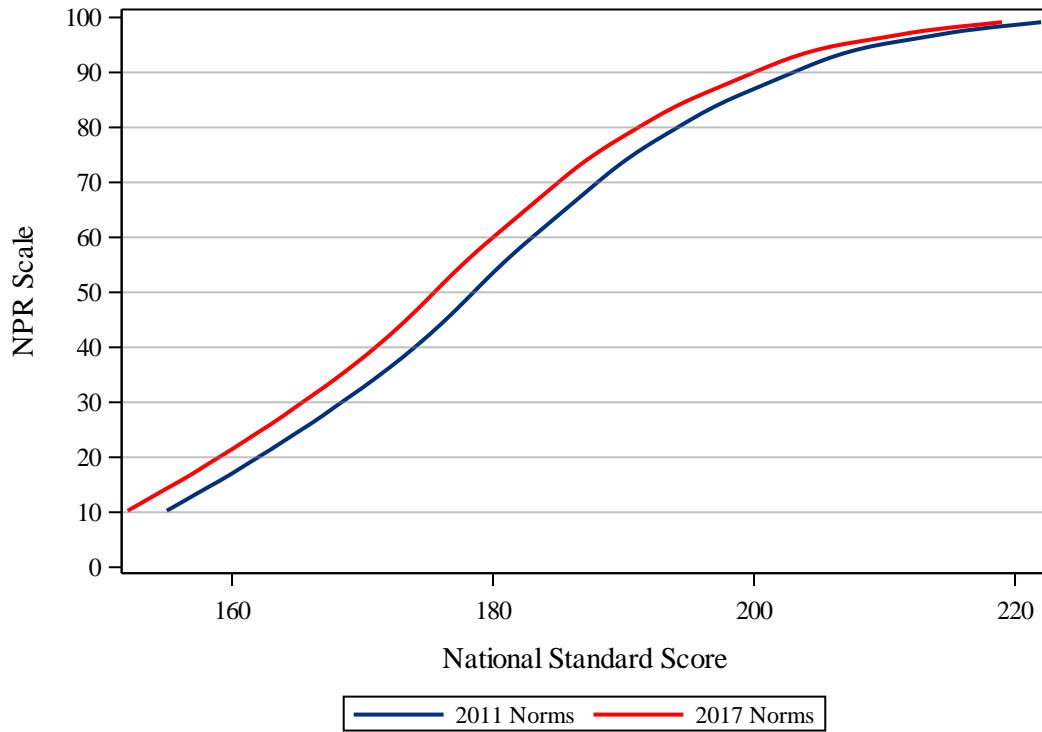


Figure 8
Grade 4 - Math

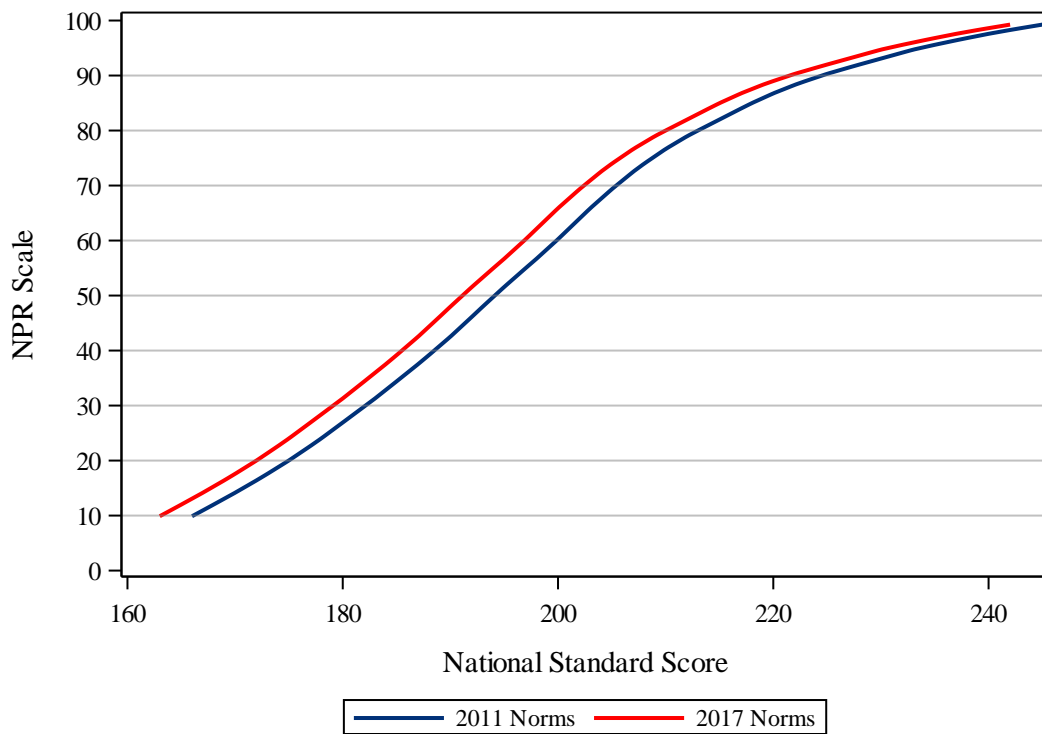


Figure 9
Grade 5 - Math

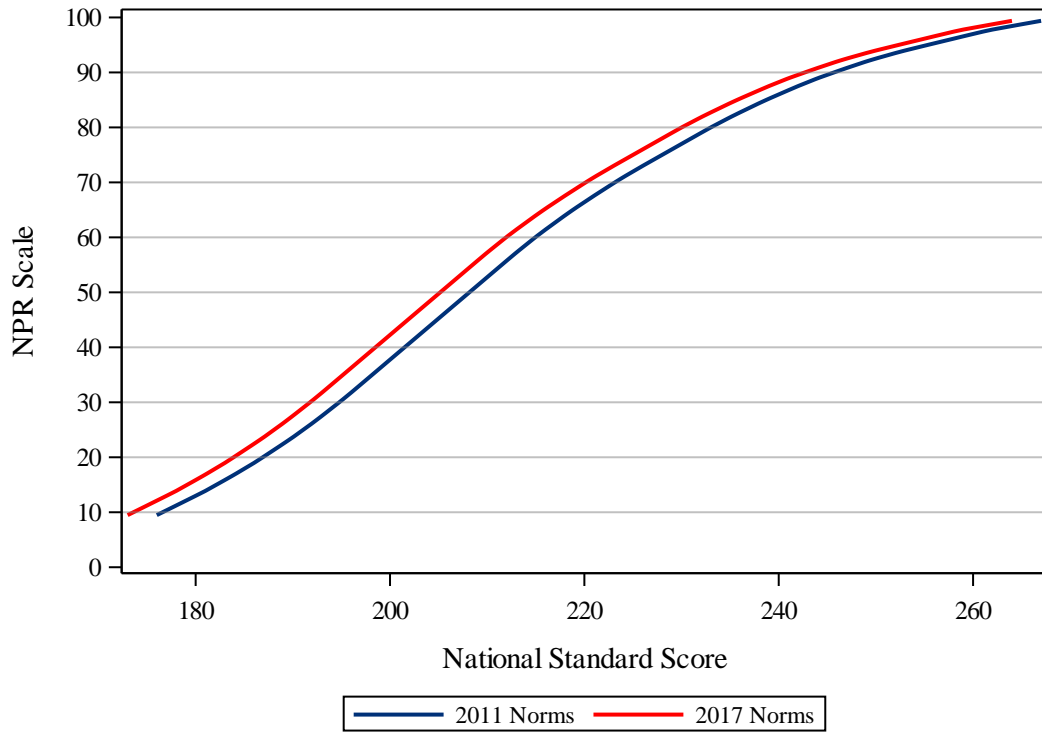


Figure 10
Grade 6 - Math

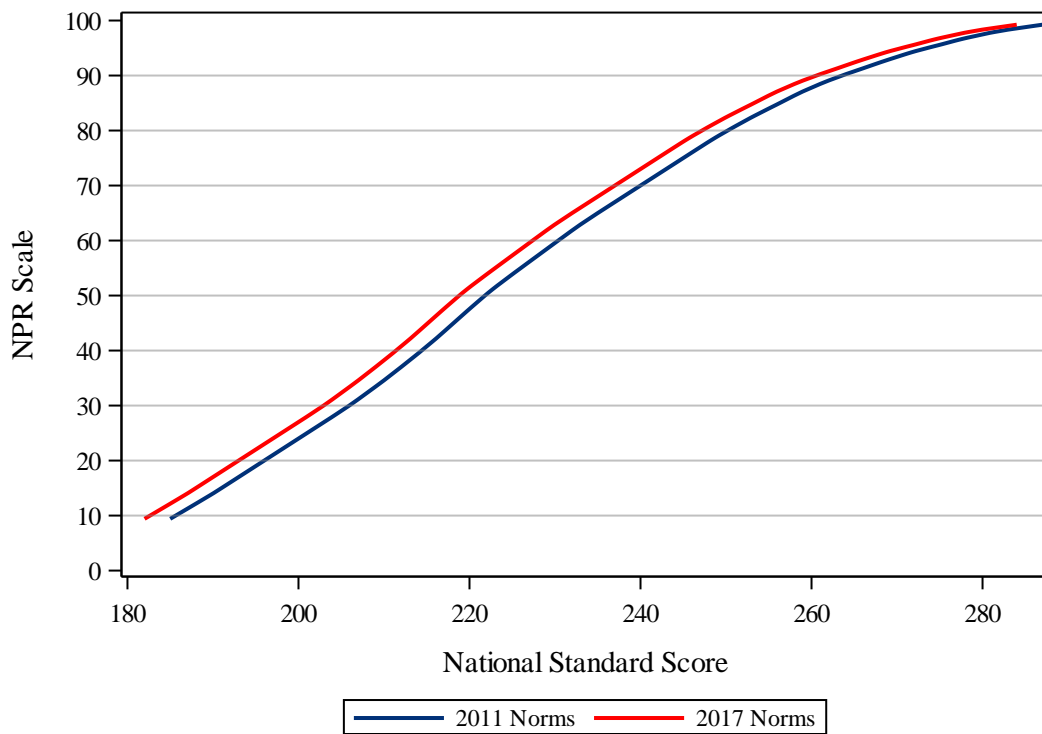


Figure 11
Grade 7 - Math

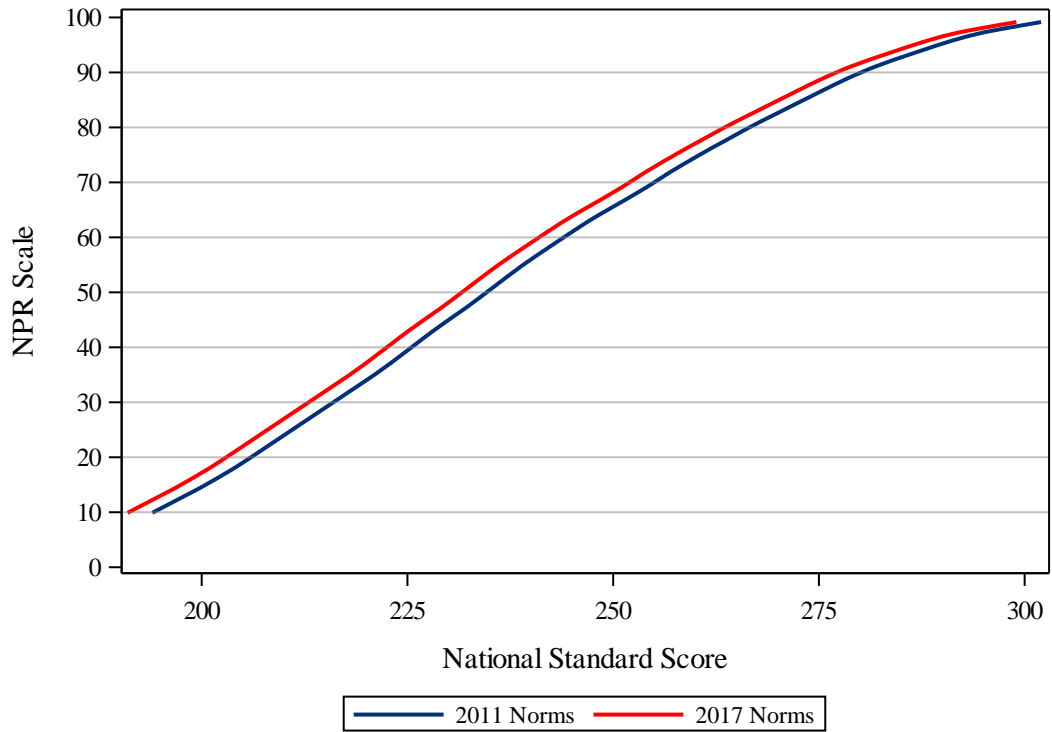


Figure 12
Grade 8 - Math

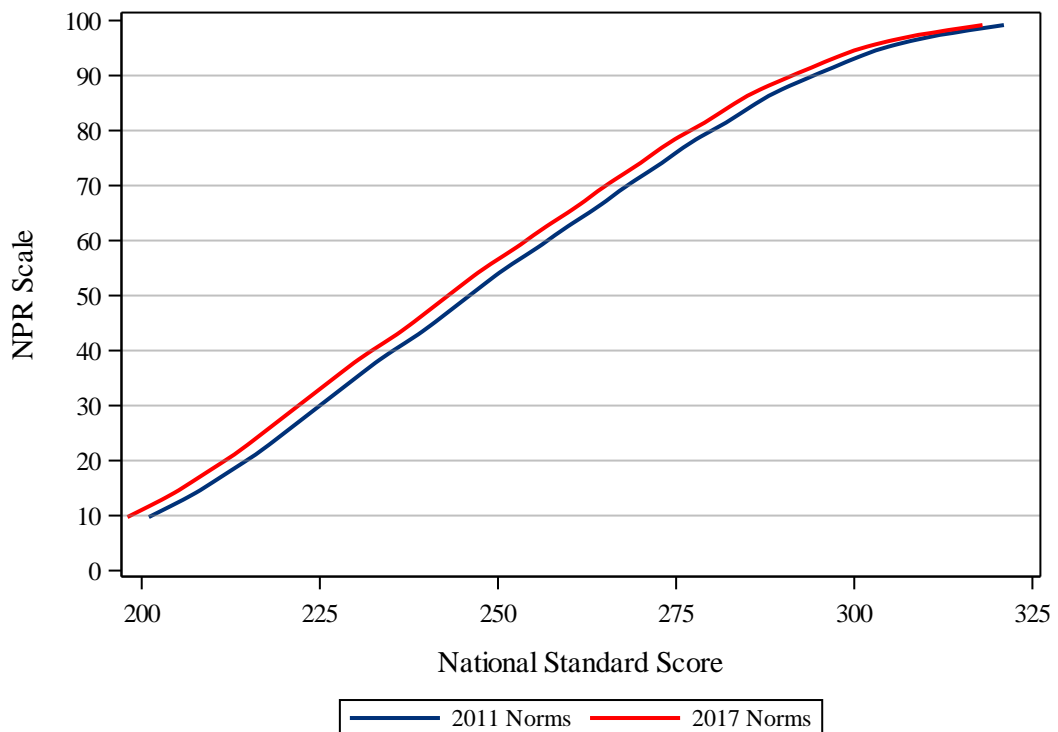


Figure 13
Grade 3 - Science

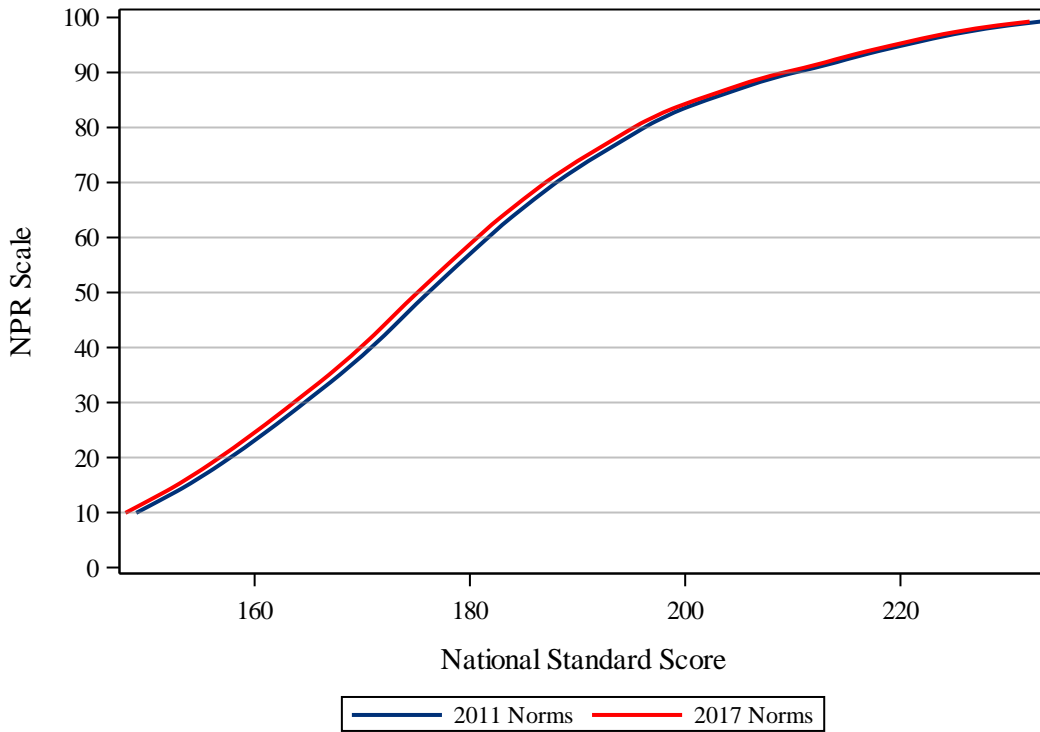


Figure 14
Grade 4 - Science

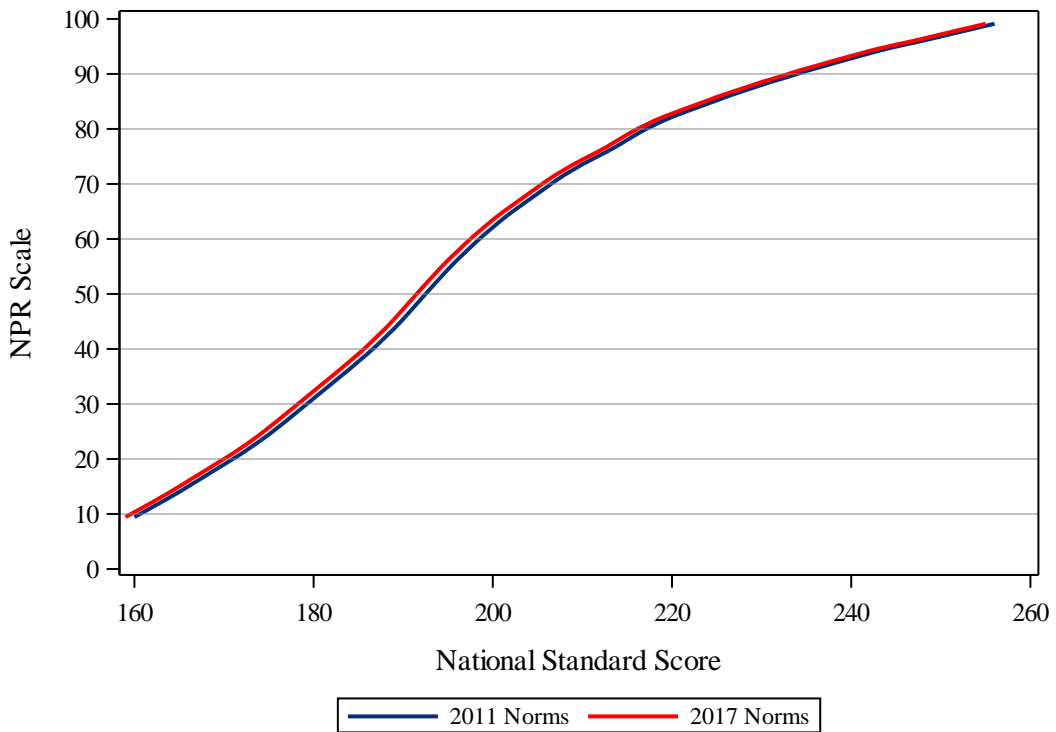


Figure 15
Grade 5 - Science

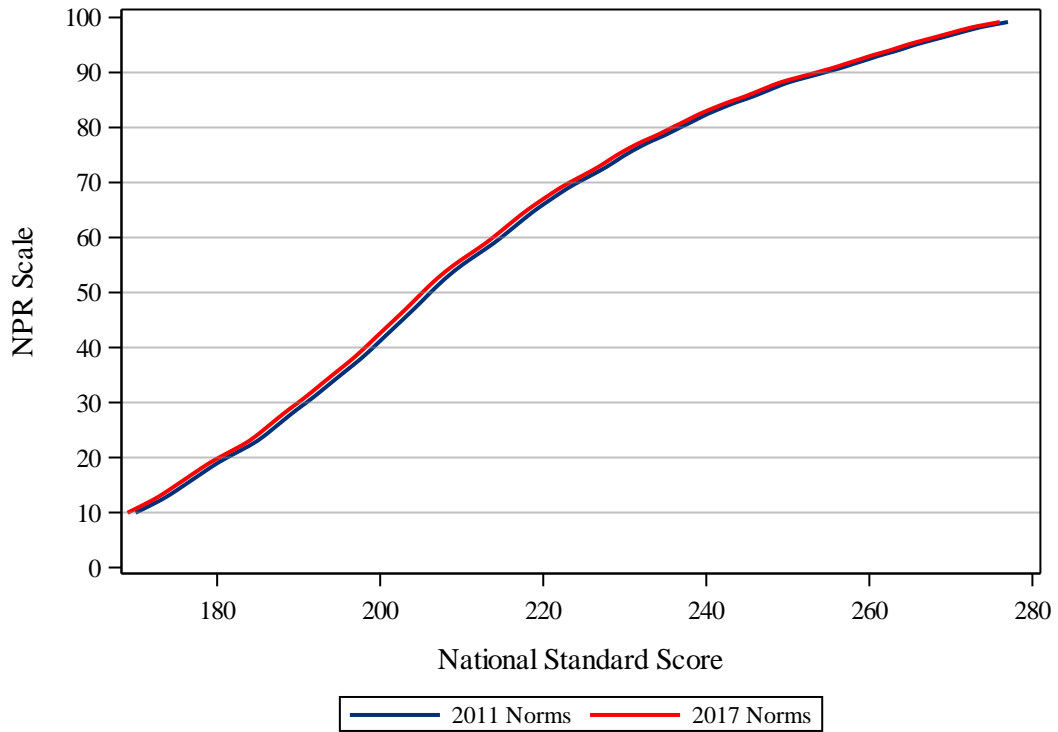


Figure 16
Grade 6 - Science

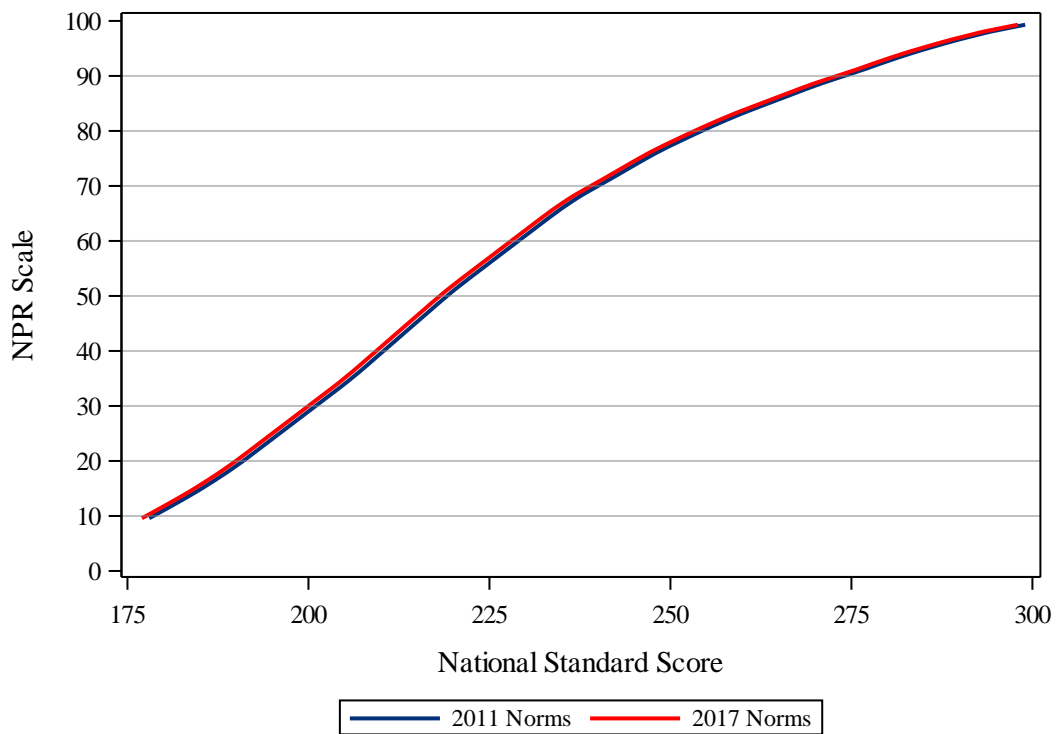


Figure 17
Grade 7 - Science

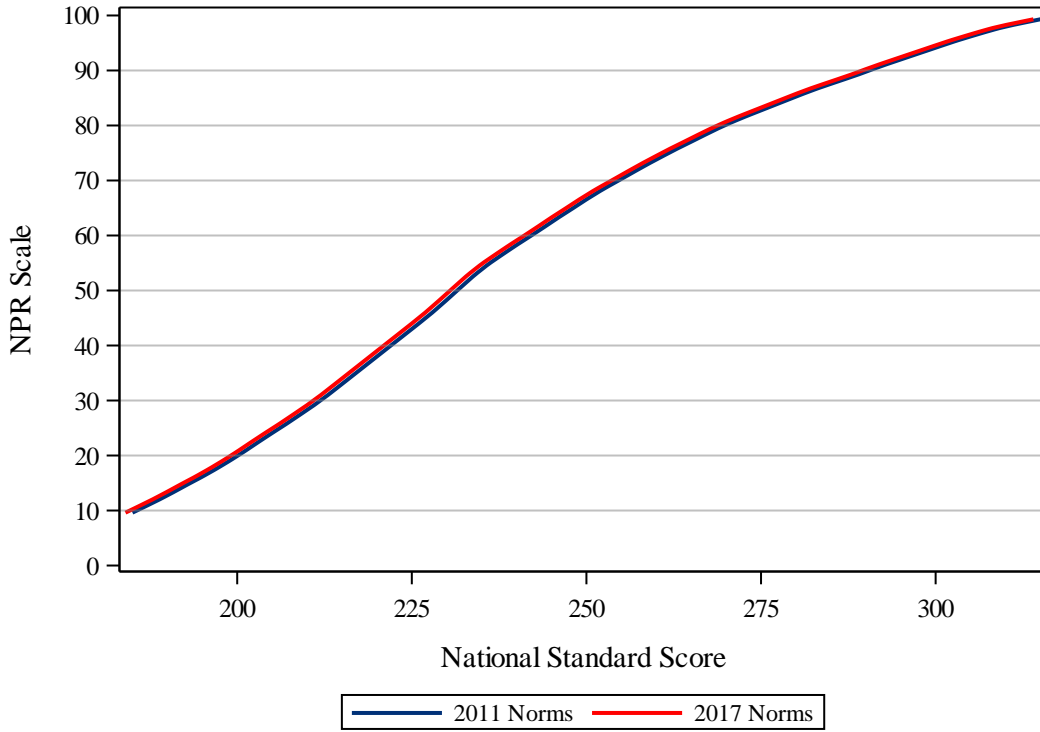


Figure 18
Grade 8 - Science

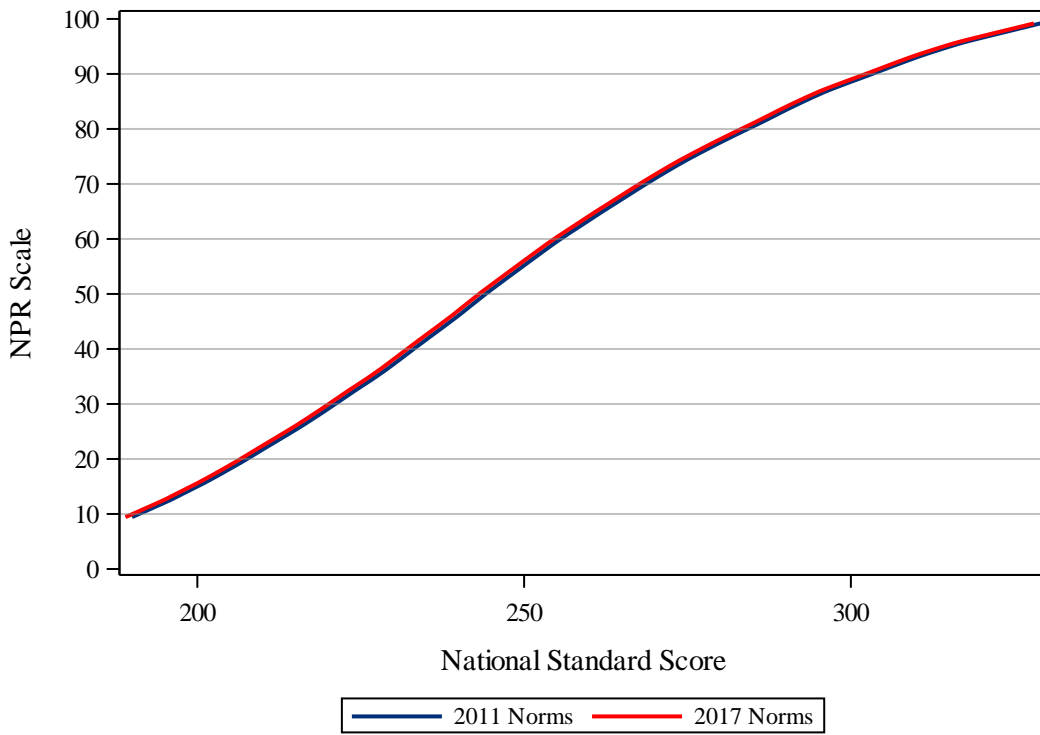


Figure 19
Grade 3 - Social Studies

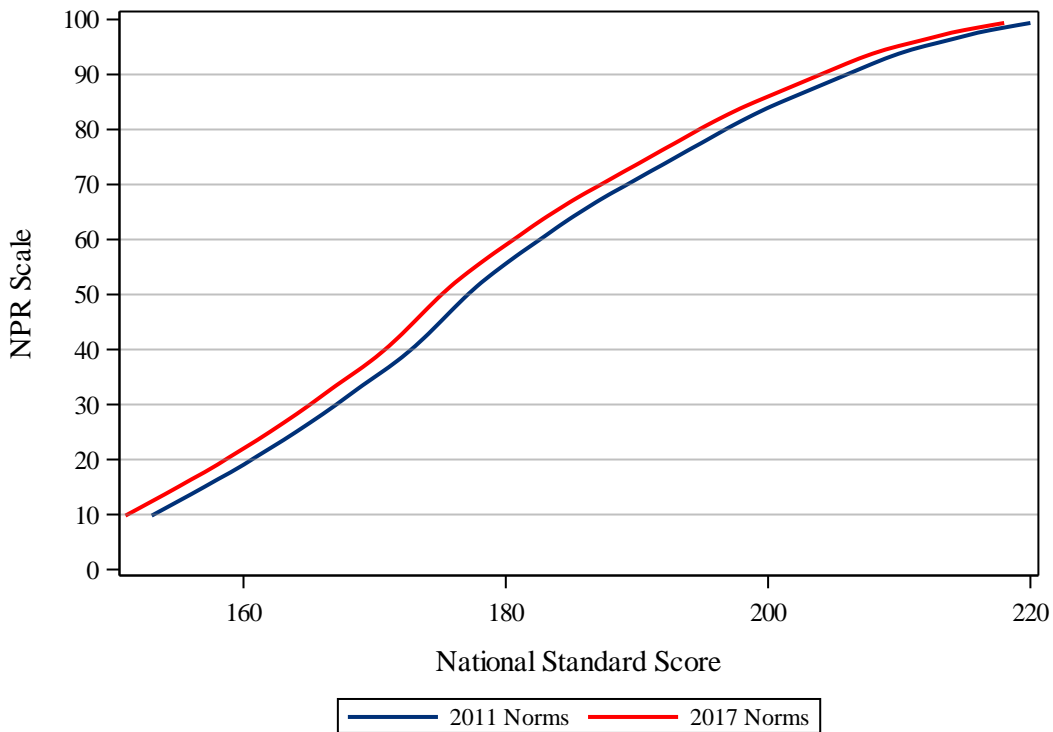


Figure 20
Grade 4 - Social Studies

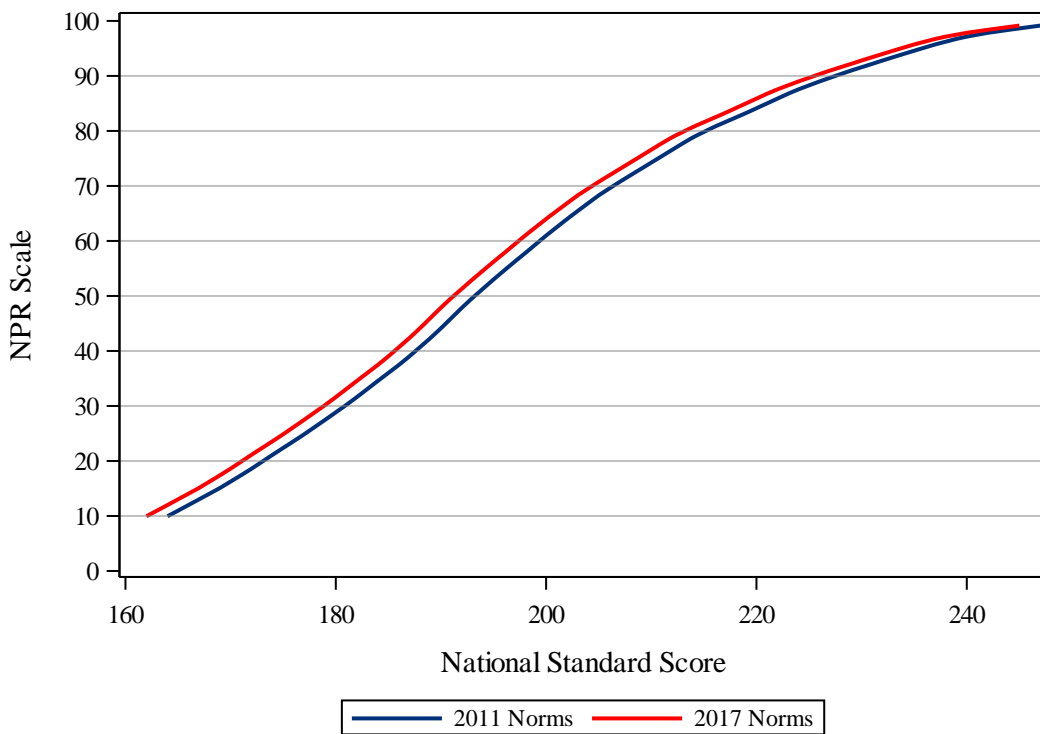


Figure 21
Grade 5 - Social Studies

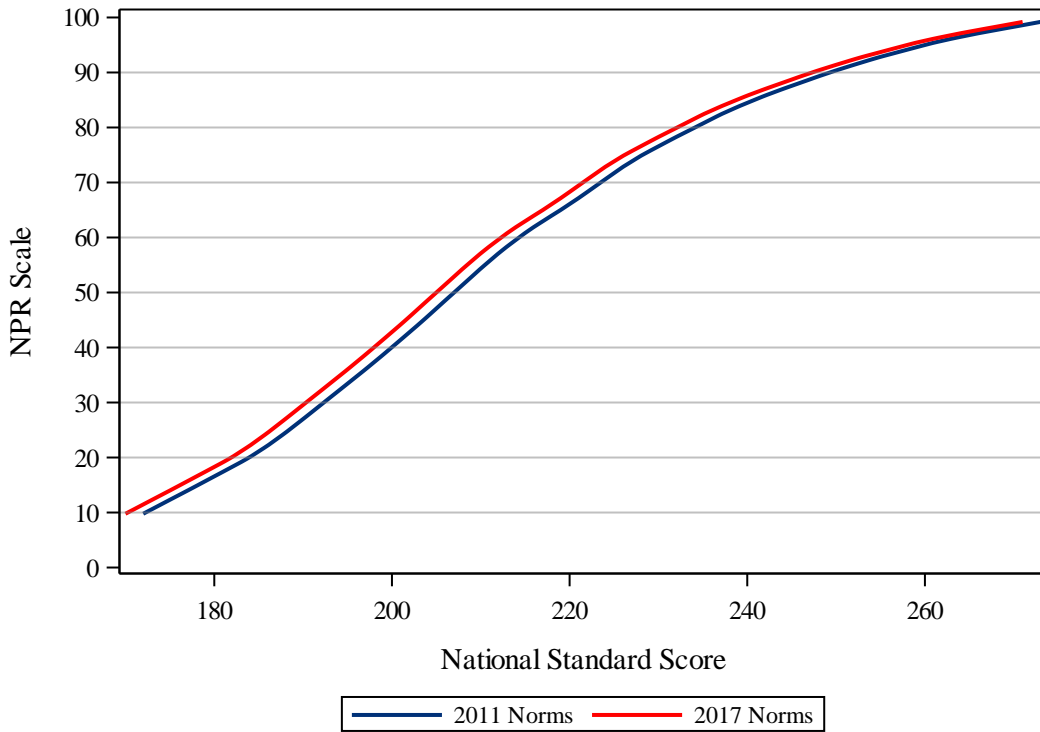


Figure 22
Grade 6 - Social Studies

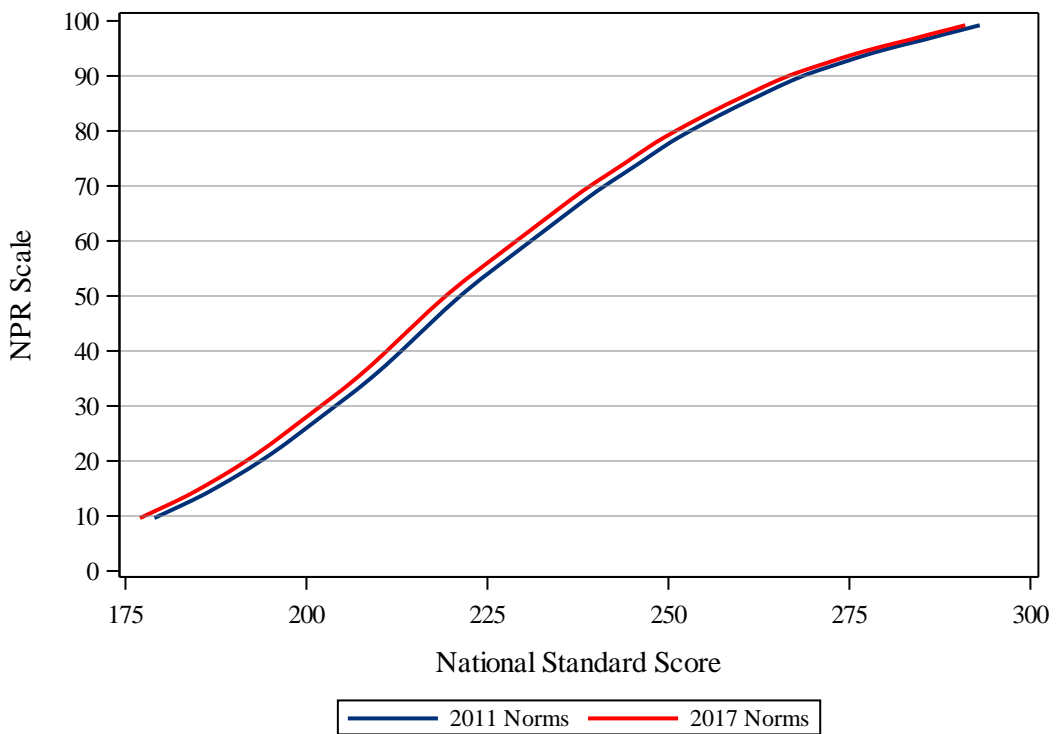


Figure 23
Grade 7 - Social Studies

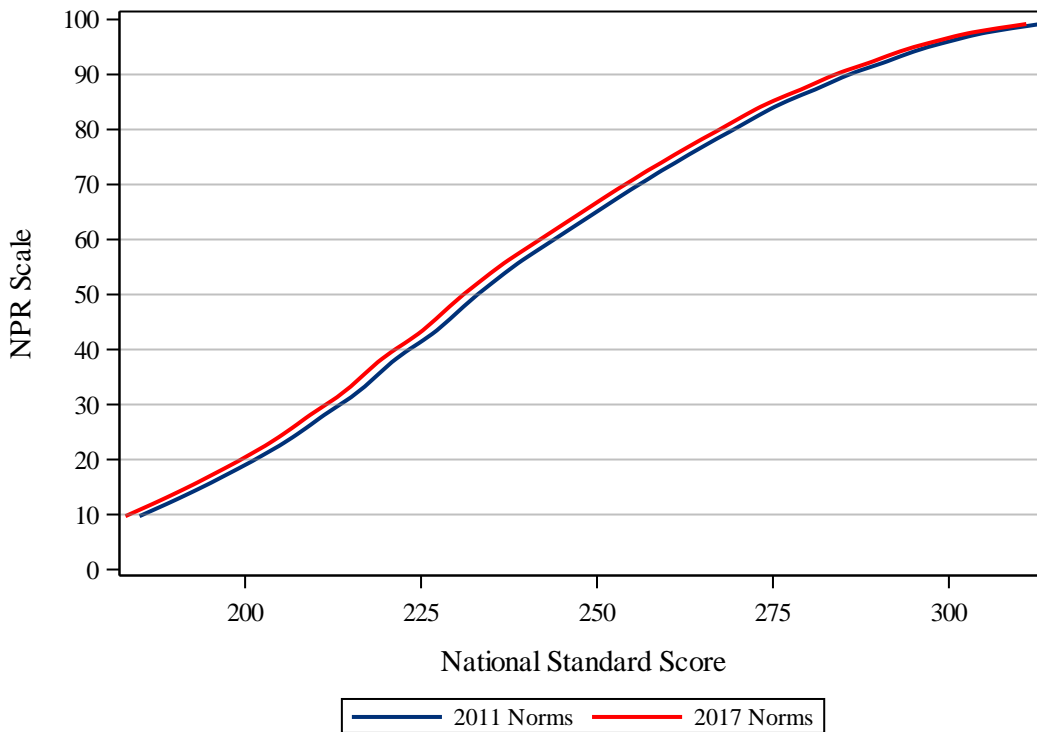


Figure 24
Grade 8 - Social Studies

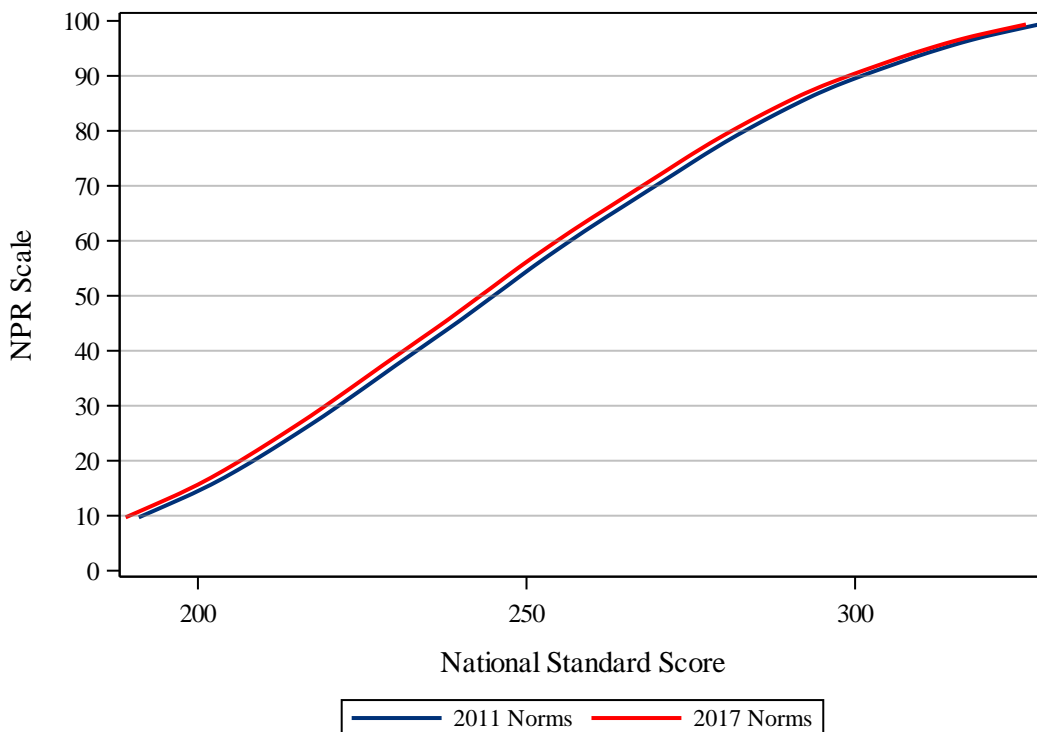


Figure 25
Grade 3 - Language

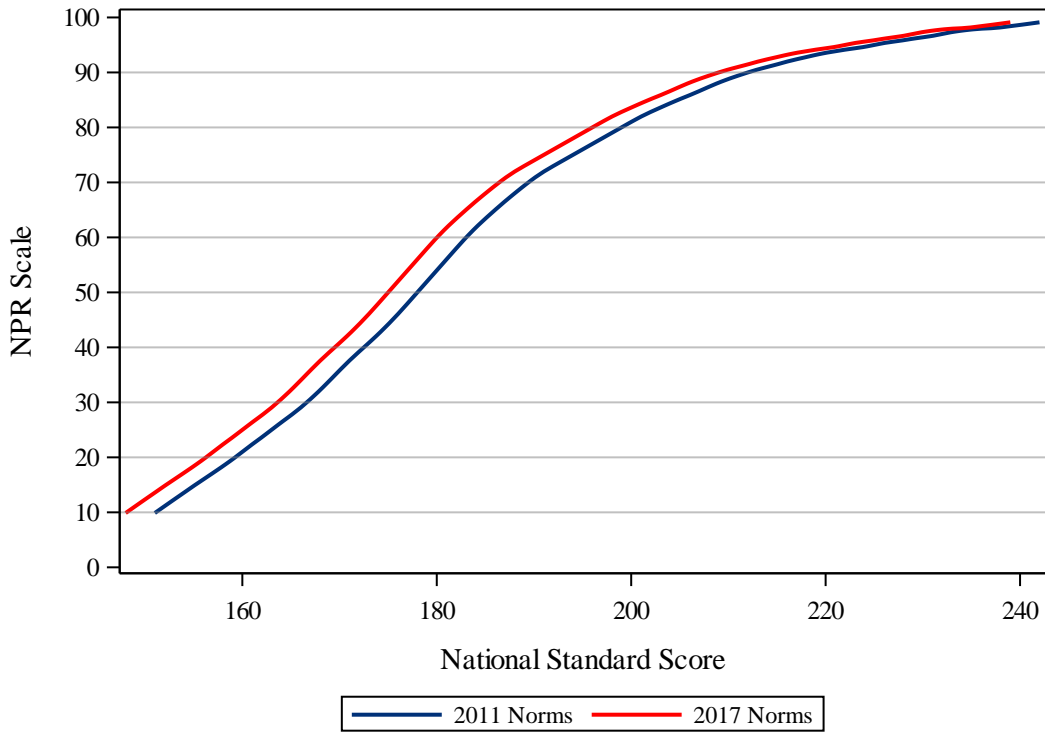


Figure 26
Grade 4 - Language

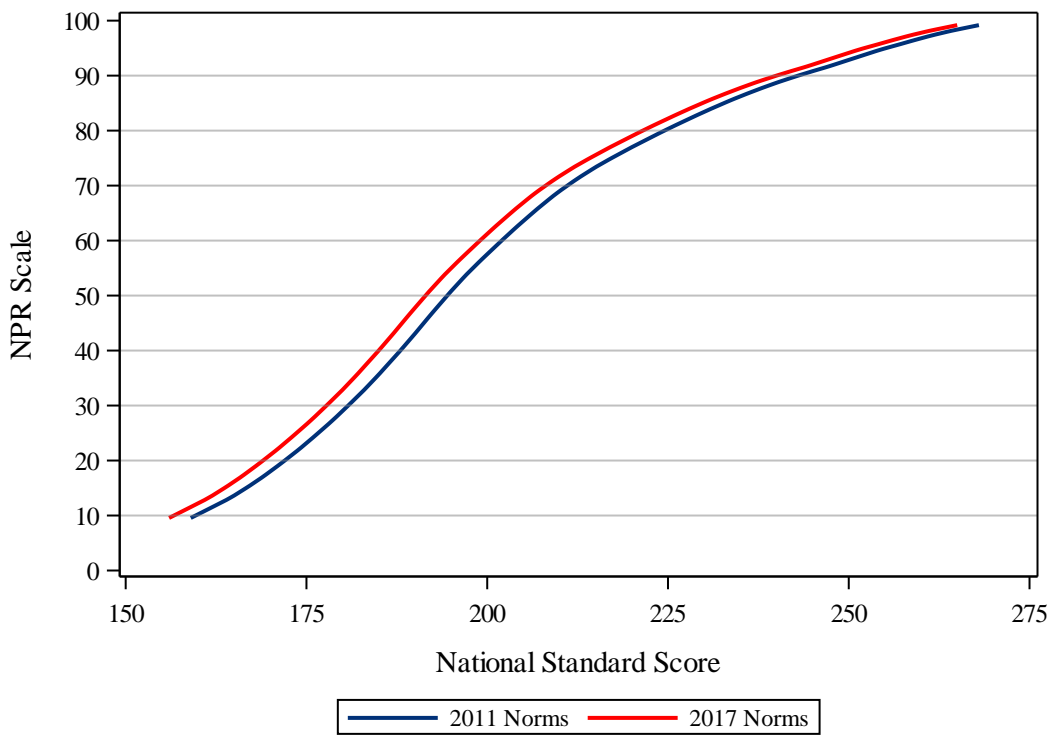


Figure 27
Grade 5 - Language

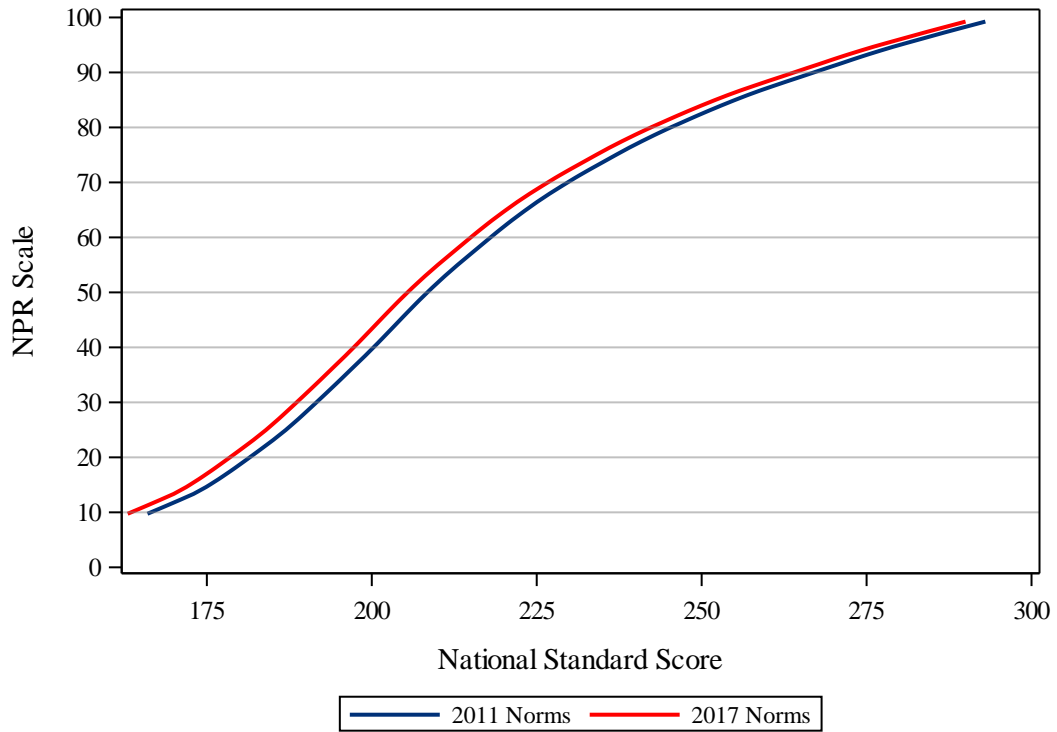


Figure 28
Grade 6 - Language

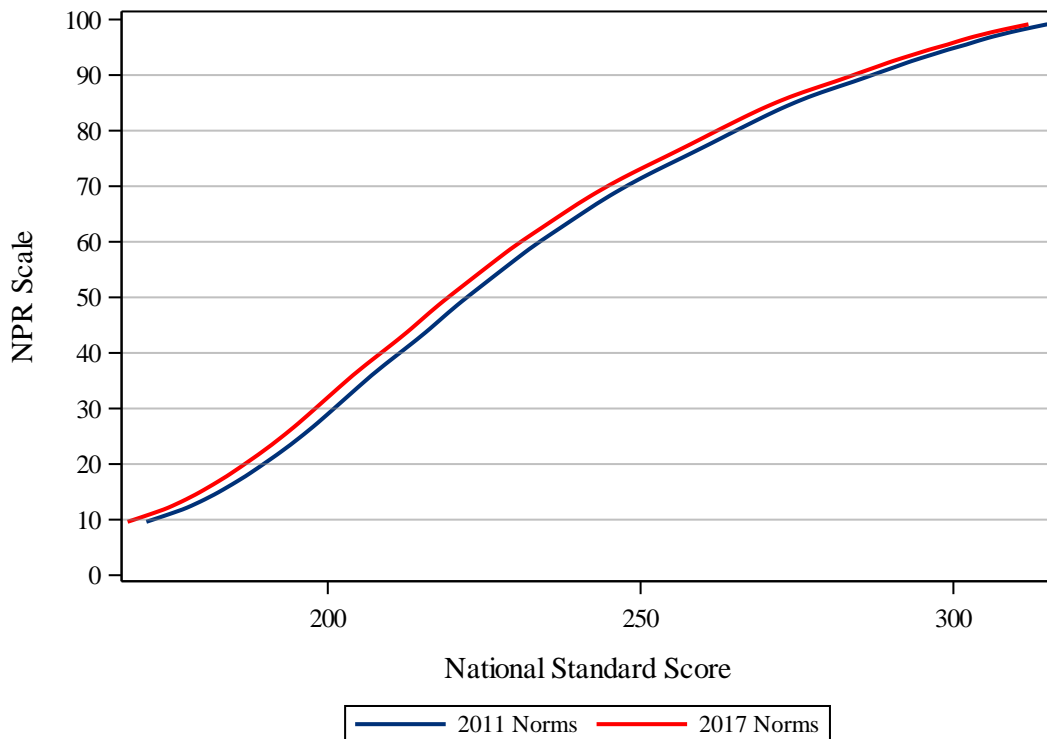


Figure 29
Grade 7 - Language

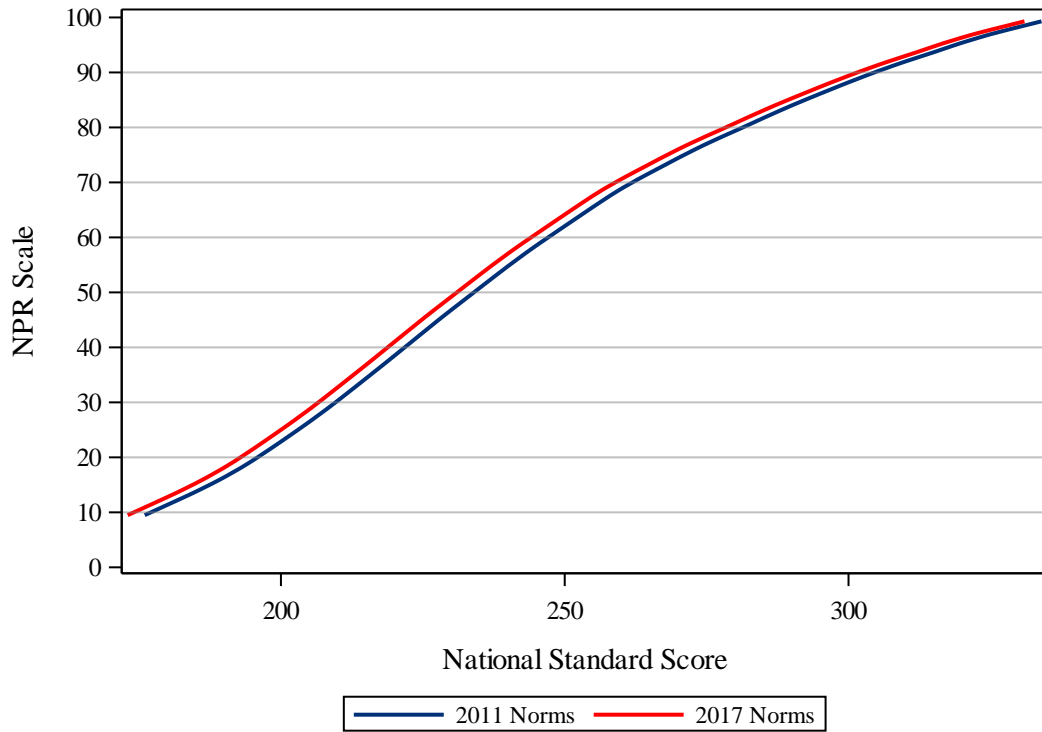
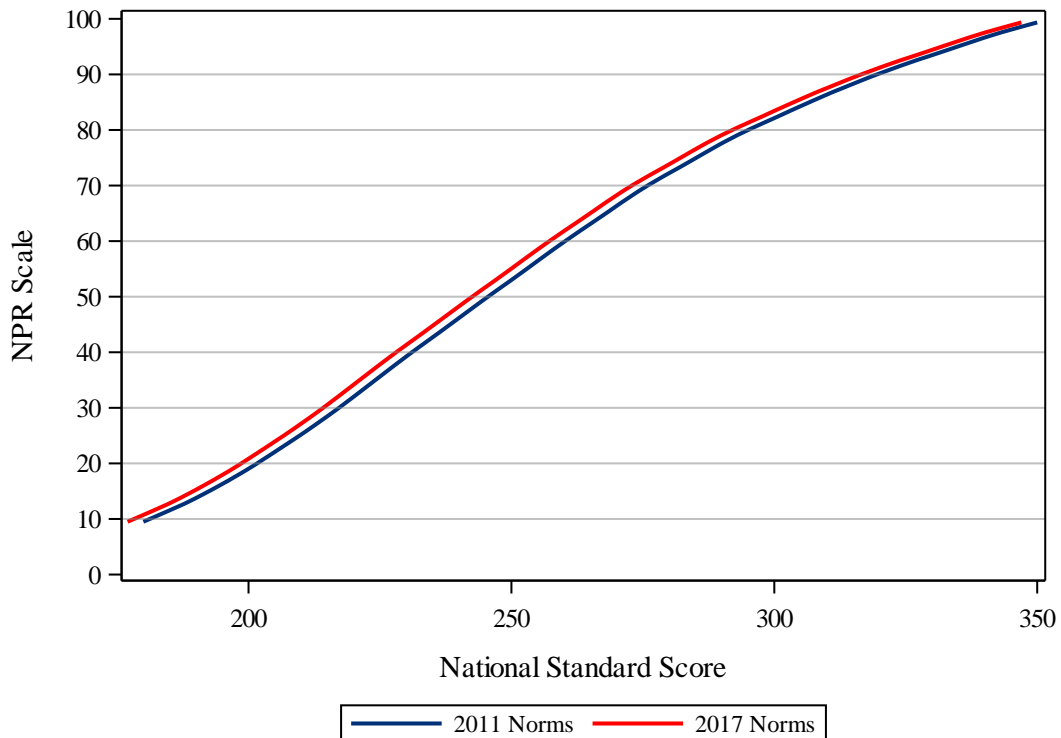


Figure 30
Grade 8 - Language



Methods of Determining and Reporting Reliability

A soundly planned, carefully constructed and comprehensive large-scale assessment represents the most accurate and dependable measure of student achievement available to parents, teachers, and school officials. Many subtle, extraneous factors that contribute to unreliability and bias in human judgments have little or no effect on scores from carefully developed assessments. In addition, other factors that contribute to apparent inconsistency in student performance can be effectively minimized in the assessment situation: temporary changes in student motivation, health, and attentiveness; minor distractions inside and outside the classroom; limitations in number, scope, and comparability of the available samples of student work; and misunderstanding by students of what the teacher expects of them. The greater effectiveness of a well-constructed achievement test in controlling these factors—compared to informal evaluations of the same achievement—is evidenced by the higher reliability of the test.

Test reliability can be quantified by a variety of statistical data, but such data reduce to two basic types of indices. The first of these indices is the reliability coefficient. In numerical value, the reliability coefficient is between .00 and .99; for standardized assessments it is generally between .60 and .95. The closer the coefficient approaches the upper limit, the greater the freedom of the scores from the influence of factors that temporarily affect student performance and obscure real differences in achievement. This ready frame of reference for reliability coefficients is deceptive in its simplicity, however. It is impossible to conclude whether a value such as .75 represents a “high” or “low,” “satisfactory” or “unsatisfactory” reliability. Only after a coefficient has been compared to those of *equally valid* and *equally practical* alternative assessments can such a judgment be made. In practice, there is always a degree of uncertainty regarding the terms “equally valid” and “equally practical,” so the reliability coefficient is rarely free of ambiguity. Nonetheless, comparisons of reliability coefficients for alternative approaches to assessment can be useful in determining the relative stability of the resulting scores.

The second of the statistical indices used to describe test reliability is the standard error of measurement. This index represents a measure of the net effect of all factors leading to inconsistency in student performance and to inconsistency in the interpretation of that performance. The SEM can be understood by a hypothetical example. Suppose a group of students at the same achievement level in reading were to take the same reading test on two occasions. Despite their equal reading ability, they would not all get the same score both times. Instead, their scores would range across an interval. A very few would get much higher scores than expected given their achievement level and a few much lower; the majority would get scores quite close to their actual achievement level. Such variation in scores would be attributable to differences in motivation, attentiveness, and other situational factors. The SEM is an index of the typical range or variability of the scores observed for students regardless of their level of achievement. It tells the degree of precision in placing a student at a point on the score scale used for reporting assessment results.

There is, of course, no way to know just how much a given student’s achievement may have been under- or over-estimated from a single administration of a test. We may, however, make reasonable estimates of the amount by which the achievement of students in a particular

reference group has been “mis-measured.” For about two-thirds of the examinees, the scores obtained are “correct” or accurate to within one SEM of the observed score. For 95 percent of the students, the scores are accurate to within two standard errors, and for more than 99 percent, the scores are accurate to within three standard error values.

Reliability estimates were obtained using Kuder-Richardson Formula 20 (K-R20). Reliability coefficients derived by this technique were based on national data and are reported for both fall and spring administrations. The coefficients for Form F of the *Iowa Assessments Complete Battery* are reported in this document in Table 8. Table 8 also reports fall and spring means and standard deviations (SDs) on the raw-score (RS) and national standard score (SS) scales.

The SEM measures the net effect of all factors leading to inconsistency in student test scores and to inconsistency in score interpretation. It is reported as the typical amount by which a student’s observed score may range from one testing occasion to another. In addition to the K-R 20 and SEM values, descriptive statistics are reported for fall and spring test administration in Table 8.

**Table 8: Means, Standard Deviations (SD), Reliability Coefficients (K-R 20),
and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 5 Grade K	Reading	Language	Vocabulary	ELA Total	Word Analysis	Listening	Extended ELA	Mathematics	Core with ET and MT	Extended Core with XET and MT
	R	L	V	ET	WA	Li	XET	M	CT	XCT
Number of Items	17	27	23		29	23		27		
Fall										
Mean	6.8	19.1	17.6	–	19.2	13.7	–	17.2	–	–
RS SD	3.7	4.6	2.8	–	5.1	3.7	–	4.4	–	–
SEM	1.8	2.2	1.8	–	2.2	2.2	–	2.3	–	–
Mean	122.9	123.3	121.7	123.3	121.4	122.7	122.0	121.4	121.8	121.8
SS SD	8.8	8.6	13.1	8.6	12.9	9.3	8.9	8.9	9.0	9.0
SEM	4.2	4.0	7.6	2.8	5.6	5.5	2.3	4.6	2.7	2.6
Reliability	.764	.775	.659	.894	.809	.647	.934	.724	.909	.917
Spring K										
Mean	10.8	22.4	19.2	–	22.5	16.5	–	21.4	–	–
RS SD	3.7	3.3	2.1	–	3.7	3.6	–	4.1	–	–
SEM	1.8	1.8	1.4	–	1.9	1.9	–	1.9	–	–
Mean	131.3	130.4	131.1	130.8	131.5	130.8	130.9	130.7	130.8	130.8
SS SD	7.4	8.5	10.1	8.5	14.3	10.8	11.1	9.8	9.8	9.8
SEM	3.5	4.6	6.8	3.2	7.6	5.9	2.5	4.6	2.8	2.6
Reliability	.769	.701	.544	.855	.717	.696	.941	.773	.916	.924

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**Table 8: Means, Standard Deviations (SD), Reliability Coefficients (K-R 20),
and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 6	Reading	Language	Vocabulary	ELA Total	Word Analysis	Listening	Extended ELA	Mathematics	Core with ET and MT	Extended Core with XET and MT
	R	L	V	ET	WA	Li	XET	M	CT	XCT
Number of Items	34	31	27		33	27		35		
Fall—Grade 1										
Mean	19.5	25.1	21.5	–	27.2	18.1	–	26.1	–	–
RS SD	7.2	2.8	2.7	–	4.5	4.0	–	5.7	–	–
SEM	2.5	1.3	1.6	–	1.9	2.1	–	2.2	–	–
Mean	139.1	137.3	138.1	138.0	138.9	138.1	138.2	138.3	138.2	138.3
SS SD	10.2	9.6	16.0	9.9	15.9	11.9	12.3	11.3	10.9	10.9
SEM	3.5	4.6	9.7	3.8	6.6	6.3	3.0	4.3	2.9	2.6
Reliability	.881	.769	.632	.849	.826	.720	.941	.856	.930	.943
Spring—Grade K										
Mean	13.5	23.0	20.3	–	25.0	15.6	–	22.2	–	–
RS SD	5.7	3.0	2.8	–	5.2	4.1	–	5.7	–	–
SEM	2.6	1.3	1.8	–	2.1	2.2	–	2.5	–	–
Mean	131.3	130.4	131.1	130.8	131.5	130.8	130.9	130.7	130.8	130.8
SS SD	7.4	8.5	15.0	8.5	14.3	10.8	11.1	9.8	9.8	9.8
SEM	3.3	3.8	9.8	3.7	5.9	5.9	2.8	4.3	2.8	2.6
Reliability	.799	.799	.574	.809	.830	.703	.935	.812	.917	.932

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 7	Reading	Language	Vocabulary	ELA Total	Word Analysis	Listening	Extended ELA	Mathematics			Core Composite	Extended English Language Arts Total	Core Composite with ET and M	Core Composite with XET and M	Science	Social Studies	Complete Composite	Complete Composite with XET and MT	Complete Composite with ET and M	Complete Composite with XET and M
								Mathematics	Computation	Math Total										
								R	L	V										
Number of Items	35	34	26		32	27		41	25					29	29					
Fall—Grade 2																				
Mean	24.0	22.2	19.8	–	25.5	21.2	–	31.0	19.2	–	–	–	–	–	24.0	23.3	–	–	–	–
RS SD	7.3	6.9	4.8	–	4.4	3.5	–	5.8	4.6	–	–	–	–	–	3.2	3.4	–	–	–	–
SEM	2.3	2.3	1.8	–	2.0	1.8	–	2.3	1.9	–	–	–	–	–	1.8	1.8	–	–	–	–
Mean	158.9	158.1	157.5	158.3	159.2	156.9	158.2	157.0	154.2	156.1	157.2	157.1	157.6	157.6	157.4	157.8	157.3	157.3	157.6	157.6
SS SD	16.3	15.1	19.0	15.1	20.4	14.8	14.0	14.8	9.9	12.8	13.4	13.4	13.8	13.8	18.3	16.3	13.0	13.0	13.2	13.2
SEM	5.2	5.0	7.1	3.2	9.1	7.7	2.9	5.9	4.0	4.1	2.6	2.5	3.4	3.3	10.5	8.9	2.9	2.9	3.2	3.2
Reliability	.900	.891	.861	.954	.802	.728	.956	.842	.836	.895	.961	.964	.941	.943	.669	.704	.951	.952	.941	.942
Spring—Grade 1																				
Mean	20.9	18.4	18.0	–	24.0	19.6	–	28.3	17.4	–	–	–	–	–	22.7	22.0	–	–	–	–
RS SD	7.6	5.8	5.0	–	4.5	3.7	–	5.8	4.8	–	–	–	–	–	3.5	3.7	–	–	–	–
SEM	2.5	2.5	2.0	–	2.2	2.0	–	2.6	2.1	–	–	–	–	–	2.0	2.0	–	–	–	–
Mean	152.2	149.9	150.9	150.8	152.2	150.4	151.0	150.3	150.1	150.2	150.5	150.6	150.6	150.6	149.8	151.1	150.5	150.6	150.5	150.6
SS SD	14.3	11.3	18.0	11.3	18.4	13.5	12.6	13.6	9.3	11.2	12.2	12.2	12.7	12.7	16.8	15.2	11.8	11.8	12.3	12.3
SEM	4.6	5.0	7.2	3.1	8.8	7.3	2.8	6.0	4.0	4.2	2.6	2.5	3.4	3.3	9.7	8.3	2.8	2.7	3.1	3.1
Reliability	.897	.811	.842	.923	.772	.708	.950	.803	.818	.857	.953	.956	.928	.931	.669	.700	.945	.947	.936	.938

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 8	Reading	Language	Vocabulary	ELA Total	Word Analysis	Listening	Extended ELA	Mathematics			Core Composite	Extended English Language Arts Total	Core Composite with ET and M	Core Composite with XET and M	Science	Social Studies	Complete Composite	Complete Composite with XET and MT	Complete Composite with ET and M	Complete Composite with XET and M
								Mathematics	Computation	Math Total										
	R	L	V	ET	WA	Li	XET	M	MC	MT	CT	XET	CT-	XCT-	SC	SS	CC	XCC	CC-	XCC-
Number of Items	38	42	26		33	27		46	27					29	29					
Fall—Grade 3																				
Mean	31.1	32.8	20.8	–	28.0	23.4	–	33.6	19.9	–	–	–	–	–	21.9	21.7	–	–	–	–
RS SD	6.3	7.4	4.3	–	4.3	2.9	–	7.5	3.6	–	–	–	–	–	4.0	3.3	–	–	–	–
SEM	2.0	2.2	1.7	–	1.8	1.5	–	2.5	2.0	–	–	–	–	–	2.0	1.9	–	–	–	–
Mean	177.5	177.0	175.4	176.9	177.6	174.6	176.6	175.3	172.3	174.3	175.6	175.5	176.1	176.0	177.0	176.6	176.0	175.9	176.3	176.2
SS SD	21.4	19.5	20.6	20.1	25.4	17.3	17.1	18.4	13.9	16.0	16.7	16.7	17.4	17.4	22.5	19.4	17.1	17.1	17.1	17.1
SEM	6.9	5.8	8.0	3.9	10.8	9.0	3.5	6.2	8.0	4.9	3.1	3.0	3.7	3.5	11.5	11.0	3.4	3.3	3.6	3.5
Reliability	.896	.911	.848	.961	.820	.728	.958	.888	.671	.907	.965	.967	.956	.958	.741	.681	.961	.962	.956	.957
Spring—Grade 2																				
Mean	29.2	30.8	19.5	–	27.0	22.4	–	30.8	18.9	–	–	–	–	–	20.5	20.6	–	–	–	–
RS SD	6.8	7.1	4.5	–	4.5	3.3	–	7.5	3.7	–	–	–	–	–	4.2	3.2	–	–	–	–
SEM	2.3	2.5	1.9	–	2.0	1.7	–	2.7	2.1	–	–	–	–	–	2.2	2.0	–	–	–	–
Mean	170.7	169.8	168.6	169.9	171.0	168.2	169.8	168.6	168.3	168.5	169.2	169.1	169.2	169.2	169.7	169.5	169.3	169.3	169.4	169.3
SS SD	19.6	17.2	19.8	17.2	23.7	16.3	16.1	16.9	13.1	14.7	15.3	15.3	15.9	15.9	21.2	17.8	15.0	15.0	15.2	15.2
SEM	6.5	6.1	8.2	4.0	10.3	8.5	3.5	6.1	7.6	4.8	3.1	3.0	3.7	3.5	11.1	11.1	3.3	3.3	3.6	3.5
Reliability	.890	.875	.827	.947	.812	.728	.954	.868	.660	.892	.958	.962	.947	.951	.724	.610	.950	.952	.944	.946

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Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18 Iowa Assessments Form F

Level 9 Grade 3	Reading	Written Expression	Conventions of Writing				Vocabulary	ELA Total	Word Analysis	Listening	Extended ELA
			Spelling	Capitalization	Punctuation	Conventions of Writing Total					
	R	WE	SP	CP	PC	CW	V	ET	WA	Li	XET
Number of Items	41	35	24	20	20		29		33	28	
Fall											
Mean	23.1	18.5	12.4	9.5	8.6	–	15.1	–	21.0	16.2	–
RS SD	8.6	8.0	5.1	4.7	4.0	–	6.5	–	5.2	3.7	–
SEM	2.8	2.6	2.1	2.0	1.9	–	2.4	–	2.5	2.3	–
Mean	177.5	176.8	175.4	175.1	177.5	174.2	175.4	176.3	177.6	174.6	176.2
SS SD	21.4	23.9	17.9	23.2	23.6	19.5	20.6	20.1	25.4	17.3	17.1
SEM	7.0	7.7	7.3	9.6	11.3	5.5	7.5	3.8	12.2	10.8	3.7
Reliability	.894	.895	.834	.828	.772	.920	.867	.964	.771	.613	.953
Spring											
Mean	26.7	21.9	15.1	11.7	10.3	–	18.0	–	22.8	18.1	–
RS SD	8.4	8.3	5.2	5.1	4.4	–	6.7	–	5.4	3.8	–
SEM	2.7	2.5	2.0	1.9	1.9	–	2.3	–	2.4	2.2	–
Mean	187.8	188.7	185.8	187.2	188.3	185.2	185.0	187.2	187.2	184.2	186.7
SS SD	24.5	28.2	20.4	29.2	27.4	22.7	21.6	21.7	28.6	19.2	19.0
SEM	7.7	8.4	7.8	10.7	11.9	5.9	7.4	4.1	12.7	10.8	3.9
Reliability	.901	.911	.854	.866	.812	.932	.883	.964	.804	.683	.958

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 9 Grade 3	Mathematics			Core Composite	Core Composite with XET	Core Composite with ET and M	Core Composite with XET and M	Science	Social Studies	Complete Composite	Complete Composite with XET and MT	Complete Composite with ET and M	Complete Composite with XET and M
	Mathematics	Computation	Math Total										
	M	MC	MT										
Number of Items	50	25						30	30				
Fall													
RS	Mean	27.6	12.3	-	-	-	-	14.0	17.3	-	-	-	-
	SD	8.3	5.8	-	-	-	-	6.3	6.6	-	-	-	-
	SEM	3.1	2.1	-	-	-	-	2.4	2.4	-	-	-	-
SS	Mean	175.3	172.3	174.3	175.3	175.3	175.8	177.0	176.6	175.8	175.8	176.1	176.1
	SD	18.4	13.9	16.0	16.7	16.7	17.4	22.5	19.4	17.1	17.1	17.1	17.1
	SEM	6.9	5.1	4.3	2.9	2.8	4.0	8.4	7.0	2.6	2.6	3.2	3.2
Reliability		.858	.868	.928	.971	.971	.948	.861	.870	.976	.976	.965	.965
Spring													
RS	Mean	32.2	17.0	-	-	-	-	16.6	20.3	-	-	-	-
	SD	8.8	6.0	-	-	-	-	6.6	6.4	-	-	-	-
	SEM	3.0	1.9	-	-	-	-	2.3	2.2	-	-	-	-
SS	Mean	185.9	185.4	185.7	186.4	186.2	186.5	187.4	186.8	186.7	186.5	186.7	186.6
	SD	20.5	16.7	17.7	19.1	19.1	19.9	25.2	21.7	19.9	19.9	20.0	20.0
	SEM	6.9	5.2	4.3	3.0	2.9	4.0	8.8	7.6	2.8	2.7	3.3	3.3
Reliability		.886	.902	.940	.975	.977	.959	.878	.877	.980	.981	.972	.973

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 10 Grade 4	Reading	Written Expression	Conventions of Writing				Vocabulary	ELA Total	Mathematics			Core Composite	Core Composite with ET and M	Science	Social Studies	Complete Composite	Complete Composite with ET and M
			Spelling	Capitalization	Punctuation	Conventions of Writing Total			Mathematics	Computation	Math Total						
			R	WE	SP	CP			PC	CW	V						
Number of Items	42	38	27	22	22		34		55	27				34	34		
Fall																	
Mean	23.8	20.6	15.4	11.2	9.4	–	19.7	–	31.6	15.7	–	–	–	16.7	19.2	–	–
RS SD	8.7	8.6	5.7	4.7	4.6	–	7.7	–	9.3	6.2	–	–	–	6.7	6.9	–	–
SEM	2.8	2.7	2.2	2.0	2.0	–	2.5	–	3.2	2.2	–	–	–	2.6	2.5	–	–
Mean	193.8	195.1	192.2	194.0	195.4	191.9	191.1	193.5	191.8	188.8	190.8	192.1	192.6	193.8	192.6	192.5	192.8
SS SD	25.9	30.5	22.2	31.4	30.0	24.9	22.5	22.8	21.8	17.4	18.9	20.4	21.2	26.6	23.3	21.4	21.3
SEM	8.4	9.6	8.6	13.5	13.0	6.9	7.3	4.6	7.6	6.2	5.4	3.5	4.4	10.1	8.5	3.2	3.7
Reliability	.895	.902	.850	.814	.811	.923	.895	.960	.880	.875	.917	.970	.957	.857	.866	.977	.970
Spring																	
Mean	26.2	23.0	17.5	12.5	10.7	–	22.5	–	35.5	19.3	–	–	–	19.1	21.9	–	–
RS SD	8.6	8.8	5.7	4.9	5.2	–	7.4	–	9.5	6.1	–	–	–	7.1	7.1	–	–
SEM	2.7	2.6	2.1	1.9	2.0	–	2.4	–	3.1	2.0	–	–	–	2.5	2.4	–	–
Mean	202.6	204.9	202.5	204.0	204.9	201.8	199.9	202.8	201.6	200.7	201.3	202.0	202.2	203.5	202.6	202.4	202.5
SS SD	28.7	34.6	25.3	36.2	34.4	28.4	23.4	24.4	24.0	20.5	21.1	22.9	23.7	29.2	26.4	23.9	23.9
SEM	9.1	10.2	9.4	14.3	13.1	7.2	7.6	4.9	7.9	6.6	6.7	3.7	4.6	10.4	9.0	3.4	3.8
Reliability	.900	.914	.861	.844	.854	.936	.895	.960	.893	.896	.928	.973	.962	.874	.884	.980	.974

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 11 Grade 5	Reading	Written Expression	Conventions of Writing				Vocabulary	ELA Total	Mathematics			Core Composite	Core Composite with ET and M	Science	Social Studies	Complete Composite	Complete Composite with ET and M
			Spelling	Capitalization	Punctuation	Conventions of Writing Total			Mathematics	Computation	Math Total						
			R	WE	SP	CP			PC	CW	V						
Number of Items	43	40	30	24	24		37		60	29				37	37		
Fall																	
Mean	24.3	23.0	17.7	11.9	10.4	–	21.8	–	34.3	18.8	–	–	–	19.9	21.0	–	–
RS SD	9.0	9.3	6.3	5.1	5.3	–	7.9	–	10.1	6.4	–	–	–	7.6	8.3	–	–
SEM	2.9	2.7	2.3	2.1	2.1	–	2.5	–	3.3	2.3	–	–	–	2.7	2.6	–	–
Mean	207.0	209.8	207.7	209.0	210.3	206.9	205.1	207.6	206.7	204.2	205.9	206.8	207.2	208.5	207.2	207.1	207.4
SS SD	29.9	36.4	26.8	37.9	36.6	30.5	24.0	25.4	25.6	21.4	22.3	24.2	25.4	30.6	28.2	25.2	25.1
SEM	9.6	10.6	10.0	15.5	14.7	7.9	7.7	5.1	8.5	7.5	6.2	4.0	4.9	10.8	8.9	3.5	4.0
Reliability	.897	.916	.861	.833	.838	.934	.897	.960	.891	.877	.924	.973	.962	.876	.900	.980	.974
Spring																	
Mean	26.7	25.1	19.7	13.2	11.6	–	24.6	–	37.4	21.4	–	–	–	22.0	23.5	–	–
RS SD	9.0	9.5	6.3	5.3	5.7	–	8.1	–	10.5	6.1	–	–	–	7.9	8.5	–	–
SEM	2.8	2.6	2.3	2.1	2.1	–	2.4	–	3.2	2.1	–	–	–	2.6	2.5	–	–
Mean	215.5	218.9	216.9	218.5	219.3	216.1	214.0	216.5	215.8	215.3	215.6	216.0	216.1	217.9	217.0	216.5	216.6
SS SD	32.2	40.1	29.3	41.0	40.0	33.3	25.5	27.3	27.9	24.7	24.8	26.3	27.2	33.3	31.2	27.5	27.7
SEM	10.0	11.0	14.5	15.8	14.5	8.0	7.5	5.3	8.6	8.3	6.3	4.1	5.0	11.0	9.3	3.6	4.1
Reliability	.904	.925	.871	.851	.868	.943	.913	.963	.906	.886	.935	.975	.966	.891	.912	.982	.978

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 12 Grade 6	Reading	Written Expression	Conventions of Writing				Vocabulary	ELA Total	Mathematics			Core Composite	Core Composite with ET and M	Science	Social Studies	Complete Composite	Complete Composite with ET and M
			Spelling	Capitalization	Punctuation	Conventions of Writing Total			Mathematics	Computation	Math Total						
	R	WE	SP	CP	PC	CW	V	ET	M	MC	MT	CT	CT-	SC	SS	CC	CC-
Number of Items	44	43	32	25	25		39		65	30				39	39		
Fall																	
Mean	26.2	25.7	17.9	13.2	12.4	–	24.3	–	35.6	19.1	–	–	–	21.8	22.8	–	–
RS SD	8.9	9.0	7.0	4.6	5.3	–	7.6	–	11.5	6.1	–	–	–	7.6	7.9	–	–
SEM	2.9	2.8	2.4	2.2	2.2	–	2.6	–	3.5	2.3	–	–	–	2.7	2.8	–	–
Mean	220.0	223.3	221.5	223.1	224.0	220.6	219.2	221.0	220.5	219.3	220.1	220.6	220.8	221.8	221.5	221.0	221.1
SS SD	33.4	41.7	30.3	42.1	41.5	34.8	26.3	28.2	28.9	25.7	25.8	27.5	28.2	34.6	32.5	28.5	28.5
SEM	10.8	13.0	10.3	20.3	16.9	9.4	9.0	6.0	8.8	9.4	6.7	4.5	5.3	12.5	12.0	4.2	4.6
Reliability	.895	.903	.885	.768	.835	.927	.882	.954	.908	.856	.933	.973	.964	.869	.879	.979	.974
Spring																	
Mean	28.0	27.1	19.4	13.9	13.4	–	26.2	–	38.6	20.8	–	–	–	23.7	24.6	–	–
RS SD	8.8	9.4	7.0	4.8	5.7	–	7.6	–	11.7	6.3	–	–	–	7.7	8.1	–	–
SEM	2.8	2.7	2.4	2.2	2.1	–	2.5	–	3.4	2.2	–	–	–	2.7	2.7	–	–
Mean	227.3	230.8	229.5	231.1	232.4	228.7	226.7	228.6	228.7	228.4	228.6	228.6	228.7	230.7	229.6	229.1	229.2
SS SD	35.3	45.0	32.2	44.6	45.4	36.8	27.5	29.6	30.6	29.3	27.9	28.9	29.8	36.8	35.5	30.4	30.5
SEM	12.2	14.23	11.5	21.9	18.2	10.2	9.0	6.7	9.9	11.5	7.6	5.1	6.0	13.8	12.8	4.6	5.1
Reliability	.900	.915	.885	.793	.863	.934	.890	.957	.915	.882	.939	.975	.967	.880	.893	.981	.977

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 13 Grade 7	Reading	Written Expression	Conventions of Writing				Vocabulary	ELA Total	Mathematics			Core Composite	Core Composite with ET and M	Science	Social Studies	Complete Composite	Complete Composite with ET and M
			Spelling	Capitalization	Punctuation	Conventions of Writing Total			Mathematics	Computation	Math Total						
	R	WE	SP	CP	PC	CW	V	ET	M	MC	MT	CT	CT-	SC	SS	CC	CC-
Number of Items	45	45	34	27	27		41		70	31				41	41		
Fall																	
Mean	25.6	24.3	17.9	14.1	10.8	–	23.7	–	35.5	17.1	–	–	–	21.7	22.1	–	–
RS SD	9.1	9.5	7.3	4.7	5.6	–	7.6	–	13.5	6.7	–	–	–	8.3	8.0	–	–
SEM	2.9	2.9	2.5	2.3	2.2	–	2.7	–	3.6	2.4	–	–	–	2.8	2.8	–	–
Mean	231.3	234.7	233.5	235.4	236.8	232.9	231.2	232.7	232.8	231.8	232.5	232.6	232.8	233.9	233.2	232.9	233.0
SS SD	36.3	46.3	32.8	45.9	47.0	38.2	28.2	30.4	31.7	30.1	28.5	29.9	30.8	37.8	36.4	31.4	31.8
SEM	11.7	14.1	11.3	22.2	18.4	10.3	10.1	6.6	8.5	10.9	6.7	4.7	5.4	12.7	12.9	4.3	4.6
Reliability	.896	.907	.882	.767	.847	.927	.871	.953	.928	.869	.944	.975	.970	.888	.875	.981	.979
Spring																	
Mean	27.2	25.6	19.6	14.9	11.7	–	25.5	–	38.3	18.8	–	–	–	23.5	23.7	–	–
RS SD	9.3	9.9	7.3	4.9	6.0	–	7.6	–	14.2	7.2	–	–	–	8.6	8.3	–	–
SEM	2.9	2.9	2.5	2.3	2.2	–	2.7	–	3.6	2.3	–	–	–	2.7	2.8	–	–
Mean	238.4	241.6	240.9	242.5	243.6	239.9	238.1	239.7	240.4	240.6	240.5	240.1	240.0	241.7	240.7	240.4	240.4
SS SD	38.6	48.8	34.0	48.1	49.2	40.0	29.0	32.1	33.9	33.5	30.9	31.8	32.9	39.9	39.0	33.2	33.6
SEM	11.8	14.1	11.5	22.2	18.1	10.3	10.3	6.6	8.5	11.0	6.7	4.7	5.4	12.7	13.1	4.4	4.7
Reliability	.906	.916	.886	.787	.865	.934	.873	.958	.937	.893	.952	.978	.973	.899	.888	.983	.980

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 14 Grade 8	Reading	Written Expression	Conventions of Writing				Vocabulary	ELA Total	Mathematics			Core Composite	Core Composite with ET and M	Science	Social Studies	Complete Composite	Complete Composite with ET and M
			Spelling	Capitalization	Punctuation	Conventions of Writing Total			Mathematics	Computation	Math Total						
	R	WE	SP	CP	PC	CW	V	ET	M	MC	MT	CT	CT-	SC	SS	CC	CC-
Number of Items	46	48	35	29	29		42		75	32				43	43		
Fall																	
Mean	26.6	26.1	18.8	14.8	14.1	–	23.4	–	37.8	18.1	–	–	–	21.5	22.3	–	–
RS SD	9.4	10.1	7.6	5.5	6.5	–	9.6	–	14.1	7.1	–	–	–	7.8	8.7	–	–
SEM	3.0	3.1	2.5	2.3	2.3	–	2.6	–	3.8	2.5	–	–	–	2.9	2.9	–	–
Mean	242.3	245.2	244.4	246.0	247.2	243.4	241.9	243.4	244.2	243.9	244.1	243.8	243.8	245.0	244.2	244.0	244.1
SS SD	39.5	50.2	34.5	49.0	50.0	41.0	29.7	32.8	34.5	34.1	31.6	32.6	33.5	40.6	39.8	33.9	34.4
SEM	12.4	15.4	11.5	20.5	17.6	9.8	8.2	6.9	9.3	11.9	7.4	5.1	5.8	15.0	13.1	4.7	5.1
Reliability	.901	.906	.889	.825	.876	.943	.924	.955	.927	.878	.946	.976	.970	.863	.891	.980	.978
Spring																	
Mean	28.0	27.2	20.0	15.3	14.7	–	25.5	–	40.4	19.5	–	–	–	22.8	23.5	–	–
RS SD	9.6	10.4	7.6	5.6	6.7	–	9.6	–	14.5	7.4	–	–	–	8.1	9.1	–	–
SEM	2.9	3.0	2.5	2.3	2.3	–	2.6	–	3.8	2.4	–	–	–	2.9	2.8	–	–
Mean	248.9	251.5	251.2	251.7	252.4	249.2	248.7	249.8	250.7	251.3	250.9	250.3	250.2	251.5	250.6	250.6	250.5
SS SD	41.4	52.6	35.6	50.5	51.6	42.6	30.9	34.1	36.1	36.8	33.2	33.6	34.5	42.4	42.1	35.2	35.6
SEM	12.6	15.2	11.1	20.5	17.7	9.8	8.4	6.9	9.4	11.8	7.4	5.1	5.8	15.0	13.2	4.7	5.1
Reliability	.908	.916	.894	.836	.882	.947	.927	.959	.932	.898	.950	.977	.971	.875	.902	.982	.979

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 15 Grade 9	Reading	Written Expression	Vocabulary	ELA Total	Mathematics			Core Composite	Core Composite with ET and M	Science	Social Studies	Complete Composite	Complete Composite with ET and M
					Mathematics	Computation	Math Total						
					R	WE	V						
Number of Items	40	54	40		40	30				48	50		
Fall													
Mean	20.0	25.8	18.9	–	16.6	12.4	–	–	–	20.5	19.2	–	–
RS SD	9.2	14.1	9.3	–	8.0	6.1	–	–	–	8.7	8.7	–	–
SEM	2.7	3.1	2.7	–	2.8	2.4	–	–	–	3.1	3.1	–	–
Mean	252.4	254.7	251.8	253.5	254.0	254.4	254.1	253.8	253.7	254.3	253.6	253.8	253.8
SS SD	42.4	43.0	31.4	34.7	36.6	37.5	33.8	34.0	34.8	42.6	42.7	35.5	36.0
SEM	12.7	9.4	8.9	6.5	12.7	14.6	9.7	5.9	7.1	15.3	15.5	5.3	6.0
Reliability	.910	.952	.919	.965	.880	.849	.917	.970	.958	.871	.868	.977	.972
Spring													
Mean	21.3	27.5	20.8	–	17.7	13.3	–	–	–	21.8	20.9	–	–
RS SD	9.6	14.6	9.8	–	8.2	6.5	–	–	–	9.5	9.8	–	–
SEM	2.7	3.0	2.6	–	2.8	2.3	–	–	–	3.1	3.1	–	–
Mean	258.8	260.2	258.2	259.4	259.9	259.6	259.8	259.6	259.7	260.4	259.6	259.7	259.8
SS SD	44.4	43.3	32.7	35.8	38.0	39.0	34.9	34.5	35.6	43.5	43.7	36.5	36.8
SEM	12.6	9.0	8.7	6.3	12.9	14.0	9.8	5.8	7.2	14.3	14.0	5.1	5.8
Reliability	.920	.957	.929	.969	.885	.871	.922	.972	.959	.892	.898	.980	.975

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 16 Grade 10	Reading	Written Expression	Vocabulary	ELA Total	Mathematics			Core Composite	Core Composite with ET and M	Science	Social Studies	Complete Composite	Complete Composite with ET and M
					Mathematics	Computation	Math Total						
	R	WE	V	ET	M	MC	MT	CT	CT-	SC	SS	CC	CC-
Number of Items	40	54	40		40	30				48	50		
Fall													
Mean	19.9	26.1	19.7	–	16.4	12.2	–	–	–	21.2	20.4	–	–
RS SD	9.7	11.1	9.1	–	7.9	6.4	–	–	–	9.4	9.4	–	–
SEM	2.7	3.3	2.7	–	2.8	2.3	–	–	–	3.1	3.1	–	–
Mean	261.7	263.0	260.6	262.2	262.6	262.7	262.6	262.4	262.4	262.9	262.1	262.4	262.4
SS SD	44.9	44.0	33.0	36.0	38.5	39.3	35.4	35.1	36.0	44.0	44.2	36.9	37.0
SEM	12.4	13.1	9.8	7.9	13.5	14.2	10.2	6.4	7.8	14.5	14.7	5.5	6.2
Reliability	.924	.912	.912	.952	.877	.869	.917	.966	.953	.892	.890	.978	.972
Spring													
Mean	21.0	27.2	21.1	–	17.4	12.9	–	–	–	22.2	21.4	–	–
RS SD	10.0	11.4	9.4	–	8.3	6.8	–	–	–	9.9	10.1	–	–
SEM	2.6	3.3	2.7	–	2.8	2.3	–	–	–	3.1	3.1	–	–
Mean	266.5	267.7	265.9	267.0	267.3	266.9	267.2	267.1	267.2	267.5	266.9	267.1	267.2
SS SD	46.2	45.1	34.1	36.8	39.5	40.5	36.5	36.0	36.6	45.3	45.5	37.7	37.6
SEM	12.3	12.9	9.6	7.8	13.1	13.7	9.9	6.3	7.7	14.1	14.1	5.4	6.1
Reliability	.929	.918	.920	.955	.889	.885	.926	.969	.956	.903	.904	.980	.974

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20),
and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 17/18 Grade 11	Reading	Written Expression	Vocabulary	ELA Total	Mathematics			Core Composite	Core Composite with ET and M	Science	Social Studies	Complete Composite	Complete Composite with ET and M
					Mathematics	Computation	Math Total						
	R	WE	V	ET	M	MC	MT	CT	CT-	SC	SS	CC	CC-
Number of Items	40	54	40		40	30				48	50		
Fall													
Mean	22.0	28.0	21.2	–	15.1	14.5	–	–	–	21.1	22.2	–	–
RS SD	10.1	12.0	8.6	–	8.4	7.2	–	–	–	9.2	10.1	–	–
SEM	2.6	3.2	2.8	–	2.7	2.3	–	–	–	3.1	3.1	–	–
Mean	268.8	269.9	268.1	269.2	269.7	269.5	269.6	269.4	269.5	269.7	269.1	269.4	269.4
SS SD	46.4	45.5	34.2	37.2	39.7	41.0	37.0	36.2	37.1	45.8	45.9	38.2	37.9
SEM	12.0	12.3	14.5	7.7	12.7	13.3	9.6	6.2	7.4	15.4	14.3	5.4	6.1
Reliability	.933	.927	.899	.957	.897	.894	.933	.971	.960	.887	.903	.980	.974
Spring													
Mean	22.8	29.2	22.4	–	16.2	15.1	–	–	–	22.0	23.2	–	–
RS SD	10.2	12.3	8.9	–	9.1	7.4	–	–	–	9.6	10.5	–	–
SEM	2.6	3.2	2.7	–	2.7	2.3	–	–	–	3.1	3.1	–	–
Mean	273.0	274.3	272.6	273.6	273.9	273.3	273.7	273.6	273.7	273.8	273.3	273.6	273.7
SS SD	47.3	46.7	35.3	38.2	41.1	42.1	37.8	36.8	37.8	46.9	46.8	38.7	38.8
SEM	12.1	12.1	10.8	7.5	12.2	13.1	9.2	5.9	7.2	15.1	14.0	5.2	5.9
Reliability	.935	.933	.907	.962	.912	.903	.940	.974	.964	.897	.911	.982	.977

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**Table 8 (continued): Means, Standard Deviations (SD), Reliability Coefficients (K-R 20), and Standard Errors of Measurement (SEM) for the Weighted Sample, Levels 5–17/18
Iowa Assessments Form F**

Level 17/18 Grade 12	Reading	Written Expression	Vocabulary	ELA Total	Mathematics			Core Composite	Core Composite with ET and M	Science	Social Studies	Complete Composite	Complete Composite with ET and M
					Mathematics	Computation	Math Total						
	R	WE	V	ET	M	MC	MT	CT	CT-	SC	SS	CC	CC-
Number of Items	40	54	40		40	30				48	50		
Fall													
Mean	23.1	29.7	22.7	–	16.5	15.4	–	–	–	22.3	23.7	–	–
RS SD	10.2	12.4	9.0	–	9.3	7.5	–	–	–	9.7	10.7	–	–
SEM	2.6	3.2	2.7	–	2.7	2.3	–	–	–	3.1	3.1	–	–
Mean	274.6	276.1	273.9	275.2	275.6	275.1	275.4	275.3	275.4	274.9	275.1	275.2	275.3
SS SD	47.3	46.8	35.3	38.2	41.4	42.5	38.1	37.1	37.8	47.1	47.0	39.0	39.2
SEM	12.0	12.0	11.0	7.4	12.0	13.1	9.1	5.9	7.1	15.0	13.6	5.2	5.8
Reliability	.936	.934	.910	.962	.916	.905	.943	.975	.965	.899	.916	.982	.978
Spring													
Mean	23.8	30.6	23.7	–	17.3	16.0	–	–	–	23.1	24.7	–	–
RS SD	10.3	12.6	9.1	–	9.7	7.7	–	–	–	10.0	11.2	–	–
SEM	2.6	3.1	2.7	–	2.7	2.3	–	–	–	3.1	3.1	–	–
Mean	278.2	279.6	277.6	278.8	278.8	278.7	278.8	278.8	278.8	278.3	279.1	278.8	278.8
SS SD	48.1	47.7	36.2	38.8	42.3	43.4	38.7	37.8	38.2	47.7	47.9	39.4	39.5
SEM	12.0	11.9	10.6	7.4	11.7	12.0	8.9	5.8	6.9	14.7	13.3	5.1	5.7
Reliability	.938	.938	.915	.964	.924	.912	.947	.977	.967	.905	.923	.983	.979

Difficulty of the Assessments

Teachers often remark that large-scale assessments, particularly when those assessments are used for accountability, are too difficult. To some extent, this perception is a reflection of the fact that items in well-designed large-scale assessments span a range of difficulty at any given grade level. No single assessment can be perfectly suited in difficulty for all students in a heterogeneous grade group. Individualized testing can be considered to help avoid extreme cases of an assessment not being well matched to the achievement level of certain students. In other situations, it is important to realize that an assessment aligned to important and often rigorous content standards, not to mention an assessment intended to provide information about the strengths and weaknesses of a large group of students, must include a range of difficulty in individual items.

To obtain high reliability of scores observed within a group, an assessment must use nearly the entire range of possible scores; the raw scores on the test should range from near zero to the highest possible score so that the items provide information about the range of examinees for which the test is intended. The best way to ensure such a continuum is to conduct one or more preliminary tryouts of items that will determine objectively the difficulty and discriminating power of the items. A few items included in the final test should be so easy that at least 90 percent of students answer them correctly. These items allow the assessment to identify the least-able students. Similarly, a few very difficult items should be included to challenge the most-able students. The remainder of the items, however, should cover a broad range of medium difficulty and should discriminate well at all levels of ability. An assessment constructed in this manner results in the widest possible range of scores and yields the highest reliability per unit of testing time.

The twelve levels of the *Iowa Assessments* were assembled to provide reliable and valid coverage of subject matter that spans the continuum of learning from kindergarten to grade 12. Item content classifications, cognitive level descriptors, and difficulty indices for three times of the school year (fall, midyear, and spring) are provided in the *Content Classifications Guide, Levels 5/6–14* and *Levels 15–17/18* for the *Iowa Assessments* Forms E, F, and G.

A summary of the Form F difficulty and discrimination indices for all tests and grades is presented in Table 9. The difficulty indices reported for each grade are item proportions (p-values) correct rather than percentage correct. These data were derived from the 2017 normative update; the mean item proportions correct are shown in **bold**; the 10th, 50th (median) and 90th percentiles of the distributions are given as well.

Appropriateness of test difficulty can best be ascertained by examining relationships between raw scores, standard scores, and percentile ranks in the tables in the *Norms and Score Conversions*. For example, the norms tables indicate that 38 of 40 items on Level 15 of the Reading test must be answered correctly to score at the 99th percentile in the fall of grade 9, and 40 items must be answered correctly to score at the 99th percentile in the spring. Similarly, the number of items needed to score at the median in fall, midyear, and spring in grade 9 are 22, 23, and 24 out of 40 respectively. This test thus appears to be appropriate in item difficulty for the grade in which it is typically administered.

It should be noted that these difficulty characteristics are for a cross section of attendance centers in the nation. The distributions of item difficulty vary markedly among attendance centers, both within and between school systems. When the same levels of the assessments are administered to all students in a given grade in some schools, the tests are too difficult; in other schools they may be too easy. When tests are too difficult, students' scores may be determined largely by "chance." When tests are too easy and scores approach the maximum possible, a student's true achievement level may be seriously underestimated.

Both content and difficulty should be considered when assigning specific levels of the assessment to individual students. The tasks reflected by the test questions and the content standards and domains covered should be relevant to the student's needs and level of development and should be in line with the purpose of the local assessment program. At the same time, the level of difficulty of the items should be such that the test is challenging, but success is attainable.

As discussed previously, item discrimination indices (item-total correlations) are routinely examined during field testing and are one of several criteria used for item selection. Developmental discrimination (changes in an item's difficulty across grades) is inferred from field-test and standardization data that shows that items administered at adjacent grade levels have increasing p -values from grade to grade.

A well-constructed assessment strives for items with strong correlations with total scores on the other items included in the test. Summary statistics from the distributions of item-total biserial correlations (item discrimination indices) are also reported in Table 9. The means (in **bold**) and the 10th, 50th, and 90th percentiles of the distributions of biserial correlations are included. As would be expected, discrimination indices vary considerably from grade to grade, test to test, and even from one skill domain to another. In general, discrimination indices tend to be higher for tests that are relatively homogeneous in content and lower for tests that include complex stimuli or for skill domains within tests that require complex cognitive processes classified at higher cognitive levels.

**Table 9: Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 5		English Language Arts					Mathematics
		Reading	Language	Vocabulary	Word Analysis	Listening	
Number of Items		34	31	27	33	27	35
Difficulty Fall	Mean	.40	.71	.77	.66	.59	.64
	P 90	.55	.80	.88	.81	.75	.73
	Median	.39	.75	.82	.73	.61	.69
	P 10	.22	.55	.56	.38	.45	.45
Difficulty Spring	Mean	.64	.83	.83	.78	.72	.79
	P 90	.79	.92	.95	.93	.87	.88
	Median	.62	.87	.89	.85	.73	.84
	P 10	.46	.67	.63	.50	.57	.60
Discrimination	Mean	.61	.61	.52	.61	.50	.55
	P 90	.68	.80	.69	.77	.64	.69
	Median	.64	.58	.55	.66	.50	.59
	P 10	.47	.44	.32	.42	.36	.33

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**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 6 Grade 1, Fall Grade K, Spring		English Language Arts					Mathematics
		Reading	Language	Vocabulary	Word Analysis	Listening	
Number of Items		34	31	27	33	27	35
Difficulty Fall	Mean	.57	.81	.80	.82	.67	.75
	P 90	.82	.94	.98	.96	.93	.94
	Median	.55	.88	.90	.89	.65	.80
	P 10	.35	.57	.29	.57	.36	.49
Difficulty Spring	Mean	.39	.74	.75	.76	.58	.63
	P 90	.64	.87	.94	.90	.83	.82
	Median	.37	.81	.85	.83	.56	.68
	P 10	.17	.50	.25	.51	.26	.38
Discrimination	Mean	.55	.60	.50	.61	.49	.52
	P 90	.68	.80	.69	.77	.64	.69
	Median	.59	.58	.48	.66	.50	.54
	P 10	.32	.44	.29	.42	.35	.31

Continued on next page...

**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 7 Grade 2, Fall Grade 1, Spring		English Language Arts					Mathematics		Social Studies	Science
		Reading	Language	Vocabulary	Word Analysis	Listening	Math	Computation		
Number of Items		35	34	26	32	27	41	25	29	29
Difficulty Fall	Mean	.68	.65	.76	.80	.78	.76	.77	.81	.83
	P 90	.88	.78	.94	.97	.98	.99	.92	.97	.98
	Median	.66	.67	.74	.86	.84	.82	.75	.83	.85
	P 10	.53	.45	.53	.54	.42	.45	.61	.49	.58
Difficulty Spring	Mean	.60	.54	.69	.75	.73	.69	.70	.76	.78
	P 90	.79	.67	.88	.92	.92	.92	.85	.92	.94
	Median	.58	.56	.67	.81	.78	.75	.68	.78	.81
	P 10	.45	.34	.46	.50	.36	.38	.54	.44	.53
Discrimination	Mean	.62	.45	.70	.51	.51	.50	.61	.54	.53
	P 90	.81	.59	.83	.64	.67	.65	.75	.83	.74
	Median	.67	.41	.71	.52	.53	.51	.64	.53	.54
	P 10	.32	.36	.56	.40	.37	.30	.44	.33	.34

Continued on next page...

**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 8 Grade 3, Fall Grade 2, Spring		English Language Arts					Mathematics		Social Studies	Science
		Reading	Language	Vocabulary	Word Analysis	Listening	Math	Computation		
Number of Items		38	42	26	33	27	46	27	29	29
Difficulty Fall	Mean	.82	.79	.80	.85	.87	.73	.74	.75	.76
	P 90	.95	.95	.97	.99	.99	.97	.86	.99	.96
	Median	.80	.80	.84	.87	.91	.75	.81	.87	.75
	P 10	.65	.56	.49	.66	.65	.45	.43	.39	.56
Difficulty Spring	Mean	.77	.74	.75	.82	.83	.67	.70	.71	.71
	P 90	.90	.89	.92	.96	.95	.91	.82	.95	.91
	Median	.75	.74	.79	.84	.87	.69	.77	.83	.70
	P 10	.60	.50	.44	.63	.61	.39	.39	.35	.51
Discrimination	Mean	.73	.58	.75	.63	.62	.50	.65	.47	.47
	P 90	.99	.74	.93	.81	.88	.66	.76	.64	.63
	Median	.69	.61	.73	.62	.56	.53	.64	.47	.48
	P 10	.49	.38	.54	.50	.45	.34	.56	.30	.31

Continued on next page...

**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 9 Grade 3		English Language Arts							Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Word Analysis	Listening	Math			Computation
				Spelling	Capitalization	Punctuation							
Number of Items		41	35	24	20	20	29	33	28	50	25	30	30
Difficulty Fall	Mean	.56	.53	.52	.48	.43	.52	.64	.58	.55	.49	.58	.47
	P 90	.72	.63	.72	.65	.61	.63	.85	.86	.79	.68	.71	.64
	Median	.56	.54	.53	.48	.47	.54	.63	.55	.55	.49	.61	.44
	P 10	.42	.39	.23	.32	.13	.36	.41	.28	.29	.26	.39	.25
Difficulty Spring	Mean	.65	.63	.63	.58	.51	.62	.69	.65	.64	.68	.68	.56
	P 90	.78	.73	.83	.76	.69	.73	.86	.93	.84	.87	.82	.73
	Median	.65	.64	.63	.58	.55	.64	.69	.62	.64	.68	.67	.54
	P 10	.51	.47	.34	.42	.21	.47	.46	.30	.39	.45	.48	.34
Discrimination	Mean	.64	.62	.65	.70	.61	.65	.46	.41	.52	.68	.57	.51
	P 90	.77	.73	.74	.86	.79	.80	.59	.56	.66	.82	.70	.68
	Median	.65	.64	.64	.70	.62	.65	.46	.44	.54	.68	.61	.53
	P 10	.47	.48	.57	.58	.41	.46	.35	.22	.35	.52	.42	.35

Continued on next page...

**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 10 Grade 4		English Language Arts					Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Math			Computation
				Spelling	Capitalization	Punctuation					
Number of Items		42	38	27	22	22	34	55	27	34	34
Difficulty Fall	Mean	.57	.54	.57	.51	.42	.58	.57	.58	.57	.49
	P 90	.72	.68	.78	.69	.64	.72	.81	.72	.73	.73
	Median	.58	.53	.52	.50	.41	.60	.57	.59	.58	.47
	P 10	.36	.37	.37	.22	.24	.38	.32	.38	.36	.27
Difficulty Spring	Mean	.62	.61	.65	.57	.49	.66	.65	.71	.64	.56
	P 90	.77	.74	.83	.76	.72	.79	.87	.83	.79	.80
	Median	.65	.62	.66	.57	.48	.65	.65	.75	.67	.56
	P 10	.43	.46	.45	.27	.29	.47	.41	.54	.46	.35
Discrimination	Mean	.65	.60	.59	.61	.66	.66	.53	.69	.58	.49
	P 90	.79	.72	.69	.78	.80	.79	.65	.84	.73	.63
	Median	.67	.62	.60	.61	.71	.68	.56	.70	.59	.51
	P 10	.48	.45	.43	.48	.51	.46	.41	.53	.39	.37

Continued on next page...

**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 11 Grade 5		English Language Arts					Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Math			Computation
				Spelling	Capitalization	Punctuation					
Number of Items		43	40	30	24	24	37	60	29	37	37
Difficulty Fall	Mean	.56	.57	.59	.50	.43	.59	.57	.65	.57	.54
	P 90	.70	.70	.77	.73	.58	.76	.85	.79	.76	.70
	Median	.57	.60	.57	.48	.39	.63	.57	.64	.56	.54
	P 10	.37	.45	.39	.21	.28	.34	.31	.50	.41	.31
Difficulty Spring	Mean	.62	.63	.66	.55	.48	.66	.62	.74	.63	.60
	P 90	.75	.75	.83	.77	.66	.83	.87	.84	.82	.75
	Median	.62	.65	.65	.53	.46	.69	.62	.77	.63	.61
	P 10	.44	.50	.46	.26	.30	.43	.36	.57	.48	.36
Discrimination	Mean	.64	.60	.61	.60	.62	.62	.55	.70	.57	.49
	P 90	.77	.72	.76	.70	.76	.77	.71	.84	.68	.59
	Median	.66	.61	.63	.62	.62	.63	.57	.72	.59	.50
	P 10	.49	.45	.42	.48	.50	.46	.34	.51	.46	.31

Continued on next page...

**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 12 Grade 6		English Language Arts					Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Math			Computation
				Spelling	Capitalization	Punctuation					
Number of Items		44	43	32	25	25	39	65	30	39	39
Difficulty Fall	Mean	.60	.60	.56	.53	.49	.62	.55	.64	.58	.56
	P 90	.75	.76	.74	.76	.66	.82	.79	.82	.70	.75
	Median	.60	.59	.55	.54	.47	.62	.55	.65	.59	.57
	P 10	.39	.43	.34	.28	.31	.35	.33	.45	.41	.35
Difficulty Spring	Mean	.64	.63	.61	.55	.54	.67	.59	.69	.63	.61
	P 90	.79	.79	.76	.77	.69	.84	.83	.83	.75	.80
	Median	.64	.63	.62	.55	.54	.66	.60	.71	.63	.62
	P 10	.43	.47	.42	.28	.34	.43	.37	.49	.46	.40
Discrimination	Mean	.61	.57	.59	.55	.62	.58	.53	.62	.56	.47
	P 90	.80	.67	.75	.71	.75	.73	.71	.78	.72	.65
	Median	.61	.59	.56	.56	.64	.60	.54	.65	.59	.50
	P 10	.42	.44	.43	.37	.46	.35	.36	.42	.37	.24

Continued on next page...

**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 13 Grade 7		English Language Arts					Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Math			Computation
				Spelling	Capitalization	Punctuation					
Number of Items		45	45	34	27	27	41	70	31	41	41
Difficulty Fall	Mean	.57	.54	.53	.52	.40	.58	.51	.55	.54	.53
	P 90	.75	.75	.69	.75	.61	.78	.73	.75	.69	.73
	Median	.56	.51	.54	.53	.38	.60	.51	.54	.56	.53
	P 10	.36	.35	.30	.24	.14	.34	.28	.35	.34	.28
Difficulty Spring	Mean	.60	.57	.58	.55	.43	.62	.55	.61	.58	.57
	P 90	.79	.78	.74	.76	.62	.80	.77	.75	.73	.76
	Median	.60	.54	.59	.56	.44	.66	.55	.63	.59	.57
	P 10	.39	.38	.33	.28	.17	.39	.32	.43	.40	.31
Discrimination	Mean	.57	.55	.59	.54	.57	.55	.51	.63	.49	.51
	P 90	.70	.69	.73	.79	.82	.77	.67	.78	.61	.65
	Median	.58	.55	.62	.56	.56	.58	.51	.65	.49	.53
	P 10	.43	.38	.39	.33	.35	.35	.35	.51	.33	.28

Continued on next page...

**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 14 Grade 8		English Language Arts					Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Math			Computation
				Spelling	Capitalization	Punctuation					
Number of Items		46	48	35	29	29	42	75	32	43	43
Difficulty Fall	Mean	.58	.54	.54	.51	.49	.56	.50	.56	.52	.50
	P 90	.71	.69	.73	.76	.67	.74	.70	.70	.69	.70
	Median	.58	.55	.52	.53	.47	.60	.51	.54	.51	.54
	P 10	.38	.40	.30	.24	.21	.24	.32	.46	.32	.25
Difficulty Spring	Mean	.61	.56	.57	.53	.51	.61	.53	.61	.55	.53
	P 90	.74	.71	.79	.76	.67	.80	.73	.73	.72	.73
	Median	.61	.57	.56	.55	.51	.64	.54	.59	.54	.57
	P 10	.41	.42	.33	.27	.32	.30	.35	.50	.34	.28
Discrimination	Mean	.61	.58	.57	.56	.58	.62	.51	.64	.50	.42
	P 90	.72	.73	.71	.77	.79	.86	.66	.82	.68	.60
	Median	.60	.58	.60	.57	.58	.63	.52	.65	.51	.44
	P 10	.49	.42	.43	.28	.33	.38	.35	.44	.30	.21

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**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 15 Grade 9		English Language Arts			Mathematics		Social Studies	Science
		Reading	Written Expression	Vocabulary	Math	Computation		
Number of Items		40	54	40	40	30	50	48
Difficulty Fall	Mean	.50	.48	.47	.40	.42	.38	.43
	P 90	.63	.60	.68	.56	.62	.52	.57
	Median	.52	.49	.45	.40	.40	.37	.43
	P 10	.28	.33	.29	.25	.17	.24	.28
Difficulty Spring	Mean	.53	.50	.52	.44	.45	.41	.45
	P 90	.67	.62	.72	.59	.65	.53	.60
	Median	.55	.52	.50	.43	.43	.40	.45
	P 10	.31	.35	.34	.28	.20	.26	.30
Discrimination	Mean	.65	.55	.57	.49	.59	.48	.45
	P 90	.80	.72	.72	.65	.73	.62	.60
	Median	.64	.56	.60	.51	.61	.49	.44
	P 10	.47	.40	.38	.25	.44	.31	.29

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**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 16 Grade 10		English Language Arts			Mathematics		Social Studies	Science
		Reading	Written Expression	Vocabulary	Math	Computation		
Number of Items		40	54	40	40	30	50	48
Difficulty Fall	Mean	.50	.48	.49	.41	.41	.41	.44
	P 90	.65	.60	.69	.58	.60	.54	.60
	Median	.50	.52	.48	.37	.36	.40	.44
	P 10	.32	.33	.28	.24	.22	.25	.29
Difficulty Spring	Mean	.52	.50	.53	.44	.43	.43	.46
	P 90	.68	.63	.72	.61	.62	.55	.63
	Median	.53	.54	.53	.40	.38	.42	.46
	P 10	.34	.35	.32	.26	.24	.27	.32
Discrimination	Mean	.61	.56	.58	.51	.62	.52	.47
	P 90	.76	.71	.75	.63	.74	.69	.61
	Median	.64	.59	.59	.53	.65	.50	.48
	P 10	.46	.35	.42	.35	.48	.35	.25

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**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 17/18 Grade 11		English Language Arts			Mathematics		Social Studies	Science
		Reading	Written Expression	Vocabulary	Math	Computation		
Number of Items		40	54	40	40	30	50	48
Difficulty Fall	Mean	.55	.52	.53	.38	.48	.44	.44
	P 90	.70	.65	.74	.53	.64	.57	.60
	Median	.55	.53	.53	.36	.46	.44	.41
	P 10	.40	.38	.37	.24	.28	.30	.32
Difficulty Spring	Mean	.57	.54	.56	.40	.50	.46	.46
	P 90	.72	.67	.77	.56	.68	.59	.62
	Median	.57	.55	.56	.38	.48	.46	.43
	P 10	.42	.40	.39	.26	.30	.32	.34
Discrimination	Mean	.61	.56	.55	.55	.67	.53	.50
	P 90	.75	.83	.69	.67	.79	.70	.65
	Median	.62	.58	.56	.56	.66	.55	.52
	P 10	.48	.31	.40	.37	.53	.31	.29

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**Table 9 (continued): Item Difficulty (Proportion Correct) and Item Discrimination (Item-Total Correlation)
Levels 5–17/18 (Grades K–12), Iowa Assessments Form F**

Level 17/18 Grade 12		English Language Arts			Mathematics		Social Studies	Science
		Reading	Written Expression	Vocabulary	Math	Computation		
Number of Items		40	54	40	40	30	50	48
Difficulty Fall	Mean	.58	.55	.57	.41	.51	.47	.46
	P 90	.73	.69	.78	.57	.68	.59	.62
	Median	.58	.56	.56	.39	.48	.48	.43
	P 10	.43	.41	.40	.27	.31	.33	.34
Difficulty Spring	Mean	.60	.57	.59	.43	.53	.49	.48
	P 90	.75	.70	.80	.59	.70	.61	.64
	Median	.60	.58	.59	.41	.50	.50	.45
	P 10	.45	.43	.43	.29	.33	.35	.36
Discrimination	Mean	.61	.56	.55	.55	.67	.53	.50
	P 90	.75	.83	.69	.67	.79	.70	.65
	Median	.62	.58	.56	.56	.66	.55	.52
	P 10	.48	.31	.40	.37	.53	.31	.29

Ceiling and Floor Effects

In schools where all students in a given grade are tested with the same test level, it is important that each test level accurately measure students of all ability levels. For exceptionally able students or students who are challenged in skills development, individualized testing or out-of-level testing with appropriate levels can be used to match test content and item difficulty to student ability levels.

Students at the extremes of the score distributions are of special concern. To measure high-ability students accurately, an assessment must have enough ceiling to allow such students to demonstrate their skills. If the test is too easy, a considerable proportion of these students will obtain perfect or near-perfect scores, and such scores may have deflated percentile ranks. If an assessment is too difficult for low-ability students, many will obtain chance scores and such scores may have inflated percentile ranks.

A summary of ceiling and floor effects for Levels 5 through 17/18 for fall and spring test administrations is shown in Table 10. On the top line of the table for each grade is the number of items in each test (k). Under "Ceiling," the percentile rank of a perfect score is listed for each test as well as the percentile rank of a score one less than perfect ($k-1$).

A "chance" score is frequently defined as the number of items in the test divided by the average number of response options per item. The percentile ranks of these "chance" estimates are listed under "Floor" in Table 10. Of course, not all students who score at this level do so by chance. However, when a substantial proportion of students in a group score at this level, it is an indication the test may be too difficult and that individualized testing should be considered.

Table 10: Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F

Level 5 Fall Grade K Spring Grade K		English Language Arts					Mathematics
		Reading	Language	Vocabulary	Word Analysis	Listening	
Number of Items (k)		34	31	27	33	27	35
CEILING							
PR of k*	Fall	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	98.0	99.9	99.9	99.7	99.9	99.9
PR of k-1*	Fall	99.0	99.0	99.6	99.9	99.9	99.3
	Spring	90.0	92.0	94.1	98.9	96.3	86.7
FLOOR							
PR of k/n*	Fall	50.0	1.0	2.4	6.2	7.4	4.0
	Spring	11.0	0.1	0.1	0.1	1.0	0.6

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F

Level 6 Fall Grade 1 Spring Grade K		English Language Arts					Mathematics
		Reading	Language	Vocabulary	Word Analysis	Listening	
Number of Items (k)		34	31	27	33	27	35
CEILING							
PR of k*	Fall	97.8	99.9	99.9	98.8	99.9	99.9
	Spring	99.9	99.9	99.9	99.9	99.9	99.9
PR of k-1*	Fall	96.7	98.4	97.4	92.3	99.9	94.8
	Spring	99.0	99.9	98.7	98.0	99.9	99.9
FLOOR							
PR of k/n*	Fall	11.6	0.1	0.1	0.1	1.6	1.9
	Spring	45.0	0.1	0.1	1.0	7.4	4.9

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Continued on next page...

**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 7 Fall Grade 2 Spring Grade 1		English Language Arts					Mathematics		Social Studies	Science
		Reading	Language	Vocabulary	Word Analysis	Listening	Math	Computation		
Number of Items (k)		35	34	26	32	27	41	25	29	29
CEILING										
PR of k*	Fall	96.0	94.3	97.7	95.1	99.9	99.9	96.3	99.9	98.7
	Spring	98.0	99.9	98.9	98.5	99.9	99.9	98.8	99.9	99.9
PR of k-1*	Fall	95.4	92.1	84.9	90.8	95.9	97.3	87.3	94.0	93.1
	Spring	97.4	99.9	92.0	96.5	99.3	99.9	94.3	98.6	97.7
FLOOR										
PR of k/n*	Fall	7.8	4.2	0.1	0.1	0.1	0.1	0.4	0.1	0.1
	Spring	14.8	8.9	0.3	0.1	0.5	0.6	1.6	0.1	0.1

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Continued on next page...

**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 8 Fall Grade 3 Spring Grade 2		English Language Arts					Mathematics		Social Studies	Science
		Reading	Language	Vocabulary	Word Analysis	Listening	Math	Computation		
Number of Items (k)		38	42	26	33	27	46	27	29	29
CEILING										
PR of k*	Fall	97.5	93.9	99.6	98.7	99.9	98.8	99.9	99.9	99.9
	Spring	99.9	99.7	99.9	99.9	99.9	99.9	99.9	99.9	99.9
PR of k-1*	Fall	89.4	89.7	84.4	82.2	86.2	96.4	99.9	99.6	95.4
	Spring	93.7	97.7	91.4	88.7	92.4	99.6	99.9	99.9	98.2
FLOOR										
PR of k/n*	Fall	0.7	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1
	Spring	1.7	1.8	1.0	0.1	0.6	0.1	0.1	0.1	0.4

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Continued on next page...

**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 9 Grade 3		English Language Arts							Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Word Analysis	Listening	Math			Computation
				Spelling	Capitalization	Punctuation							
Number of Items (k)		41	35	24	20	20	29	33	28	50	25	30	30
CEILING													
PR of k*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.9	98.8	99.9	99.9	99.7	99.9	99.9	99.9	99.0	99.9	99.9
PR of k-1*	Fall	99.9	99.9	99.0	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	98.0	96.8	94.8	97.9	98.4	96.3	99.6	99.0	92.9	96.2	99.9
FLOOR													
PR of k/n*	Fall	6.0	15.0	8.6	20.4	20.2	9.8	2.8	3.4	4.2	18.3	10.0	23.1
	Spring	2.6	8.8	4.0	14.0	12.2	4.7	0.7	1.0	0.9	6.0	3.8	13.2

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Continued on next page...

**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 10 Grade 4		English Language Arts					Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Math			Computation
				Spelling	Capitalization	Punctuation					
Number of Items (k)		42	38	27	22	22	34	55	27	34	34
CEILING											
PR of k*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.0	99.9	99.9
PR of k-1*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.3	99.9	99.9
	Spring	99.9	98.0	96.1	99.9	98.8	98.7	99.9	90.9	97.9	99.9
FLOOR											
PR of k/n*	Fall	10.9	13.6	6.8	16.3	28.0	10.2	3.1	9.8	6.6	14.8
	Spring	6.9	10.0	3.8	12.9	21.5	6.0	1.0	4.2	3.9	9.0

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

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**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 11 Grade 5		English Language Arts					Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Math			Computation
				Spelling	Capitalization	Punctuation					
Number of Items (k)		43	40	30	24	24	37	60	29	37	37
CEILING											
PR of k*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
PR of k-1*	Fall	99.9	99.9	99.6	99.9	99.9	99.9	99.9	98.7	99.9	99.9
	Spring	99.9	98.5	96.1	99.2	97.8	98.1	99.9	92.0	96.9	98.3
FLOOR											
PR of k/n*	Fall	9.2	9.4	0.4	15.0	24.9	3.9	2.8	6.0	9.0	8.4
	Spring	6.5	8.0	0.1	12.0	19.9	2.0	0.8	3.2	6.0	5.3

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Continued on next page...

**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 12 Grade 6		English Language Arts					Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Math			Computation
				Spelling	Capitalization	Punctuation					
Number of Items (k)		44	43	32	25	25	39	65	30	39	39
CEILING											
PR of k*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
PR of k-1*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	98.0	98.9	99.9	98.5	98.3	99.9	95.9	99.9	99.9
FLOOR											
PR of k/n*	Fall	7.3	6.2	6.9	8.3	13.7	5.7	5.2	4.6	6.0	5.7
	Spring	5.4	5.2	4.8	6.8	11.6	3.4	2.3	3.0	4.0	4.0

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Continued on next page...

**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 13 Grade 7		English Language Arts					Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Math			Computation
				Spelling	Capitalization	Punctuation					
Number of Items (k)		45	45	34	27	27	41	70	31	41	41
CEILING											
PR of k*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
PR of k-1*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.9	99.0	99.9	99.6	99.9	99.9	97.0	99.9	99.9
FLOOR											
PR of k/n*	Fall	7.8	9.7	8.2	7.4	30.0	6.2	12.0	9.9	7.4	8.6
	Spring	6.4	8.7	5.5	6.6	25.9	5.0	9.2	7.7	5.5	7.0

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Continued on next page...

**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 14 Grade 8		English Language Arts					Mathematics		Social Studies	Science	
		Reading	Written Expression	Conventions of Writing			Vocabulary	Math			Computation
				Spelling	Capitalization	Punctuation					
Number of Items		46	48	35	29	29	42	75	32	43	43
CEILING											
PR of k*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
PR of k-1*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.9	99.6	99.9	99.6	99.9	99.9	97.8	99.9	99.9
FLOOR											
PR of k/n*	Fall	9.3	9.3	7.9	8.9	15.2	15.2	11.6	6.9	13.2	9.6
	Spring	7.5	8.2	6.1	7.4	14.0	11.5	9.2	5.5	11.5	7.5

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Continued on next page...

**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 15 Grade 9		English Language Arts			Mathematics		Social Studies	Science
		Reading	Written Expression	Vocabulary	Math	Computation		
Number of Items		46	48	42	75	32	43	43
CEILING								
PR of k*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.7	99.6	99.9	99.9	99.9	99.9
PR of k-1*	Fall	99.9	99.0	99.9	99.9	99.9	99.9	99.9
	Spring	98.5	96.2	98.1	99.9	99.2	99.9	99.9
FLOOR								
PR of k/n*	Fall	17.9	24.8	15.1	15.4	14.0	26.8	18.1
	Spring	15.6	22.7	12.5	11.9	12.4	23.9	16.9

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

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**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 16 Grade 10		English Language Arts			Mathematics		Social Studies	Science
		Reading	Written Expression	Vocabulary	Math	Computation		
Number of Items		46	48	42	75	32	43	43
CEILING								
PR of k*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.9	99.4	99.9	99.9	99.9	99.9
PR of k-1*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	98.0	99.9	98.6	99.9	99.2	99.9	99.9
FLOOR								
PR of k/n*	Fall	18.6	16.6	10.8	13.1	17.9	24.0	17.0
	Spring	17.0	15.0	9.0	11.5	16.1	22.0	15.8

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Continued on next page...

**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 17/18 Grade 11		English Language Arts			Mathematics		Social Studies	Science
		Reading	Written Expression	Vocabulary	Math	Computation		
Number of Items		46	48	42	75	32	43	43
CEILING								
PR of k*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.9	99.9	99.9	99.9	99.9	99.9
PR of k-1*	Fall	99.9	99.9	99.9	99.9	99.7	99.9	99.9
	Spring	98.4	99.2	98.8	99.9	98.1	99.4	99.9
FLOOR								
PR of k/n*	Fall	15.0	14.2	4.0	26.3	11.4	19.8	16.9
	Spring	13.5	12.9	4.0	24.4	10.6	18.3	16.0

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Continued on next page...

**Table 10 (continued): Ceiling and Floor Effects, Levels 5–17/18
Iowa Assessments Form F**

Level 17/18 Grade 12		English Language Arts			Mathematics		Social Studies	Science
		Reading	Written Expression	Vocabulary	Math	Computation		
Number of Items		46	48	42	75	32	43	43
CEILING								
PR of k*	Fall	99.9	99.9	99.9	99.9	99.9	99.9	99.9
	Spring	99.9	99.9	99.0	99.9	99.0	99.9	99.9
PR of k-1*	Fall	98.9	98.6	98.3	99.9	97.6	99.4	99.9
	Spring	98.1	97.2	97.5	99.6	96.2	98.2	99.4
FLOOR								
PR of k/n*	Fall	13.0	12.1	3.7	23.4	9.9	17.4	15.7
	Spring	11.8	11.0	3.2	21.8	9.0	15.5	14.5

* Percentile Rank of k (perfect raw score), k – 1 (one less than perfect raw score), and k/n (chance-level raw score)

Completion Rates

Two indices of completion rates for all tests and levels are shown in Table 11. The first is percent of students completing the test. Because something less than 100 percent completion is generally considered reasonable for most achievement tests, the percent of students who completed at least 75 percent of the items in the test is also given. The data in these tables indicate that most of the tests at most levels are essentially “power” tests. Note that completion rates for Levels 5 through 8 are not included because the tests at those levels are read aloud by the test proctor, so the completion rates are typically 99 to 100 percent.

**Table 11: Percent Completing Each Subtest
Iowa Assessments—Form F, Levels 9 – 17/18**

Level 9 Grade 3	ENGLISH LANGUAGE ARTS							MATHEMATICS		Social Studies	Science	
	Reading	Written Expression	CONVENTIONS OF WRITING			Vocabulary	Word Analysis	Listening	Math			Computation
			Spelling	Capitalization	Punctuation							
Percent Completing Test	96	98	94	82	78	90			98	82	98	99
Percent Completing 75% of Test	99	99	98	92	90	95			99	91	99	99

**Table 11 (continued): Percent Completing Each Subtest
Iowa Assessments—Form F, Levels 9 – 17/18**

Level 10 Grade 4	ENGLISH LANGUAGE ARTS						MATHEMATICS		Social Studies	Science
	Reading	Written Expression	CONVENTIONS OF WRITING			Vocabulary	Math	Computation		
			Spelling	Capitalization	Punctuation					
Percent Completing Test	99	99	96	87	83	93	98	83	98	98
Percent Completing 75% of Test	99	99	98	94	94	97	99	94	99	99

**Table 11 (continued): Percent Completing Each Subtest
Iowa Assessments—Form F, Levels 9 – 17/18**

Level 11 Grade 5	ENGLISH LANGUAGE ARTS						MATHEMATICS		Social Studies	Science
	Reading	Written Expression	CONVENTIONS OF WRITING			Vocabulary	Math	Computation		
			Spelling	Capitalization	Punctuation					
Percent Completing Test	97	99	98	88	81	97	98	86	98	99
Percent Completing 75% of Test	99	99	99	96	94	99	99	93	99	99

**Table 11 (continued): Percent Completing Each Subtest
Iowa Assessments—Form F, Levels 9 – 17/18**

Level 12 Grade 6	ENGLISH LANGUAGE ARTS					MATHEMATICS			Social Studies	Science
	Reading	Written Expression	CONVENTIONS OF WRITING			Vocabulary	Math	Computation		
			Spelling	Capitalization	Punctuation					
Percent Completing Test	99	99	98	94	98	97	98	92	99	98
Percent Completing 75% of Test	99	99	99	97	99	98	99	97	99	99

**Table 11 (continued): Percent Completing Each Subtest
Iowa Assessments—Form F, Levels 9 – 17/18**

Level 13 Grade 7	ENGLISH LANGUAGE ARTS					MATHEMATICS			Social Studies	Science
	Reading	Written Expression	CONVENTIONS OF WRITING			Vocabulary	Math	Computation		
			Spelling	Capitalization	Punctuation					
Percent Completing Test	97	99	95	98	73	95	98	92	99	99
Percent Completing 75% of Test	99	99	99	99	91	99	99	97	99	99

**Table 11 (continued): Percent Completing Each Subtest
Iowa Assessments—Form F, Levels 9 – 17/18**

Level 14 Grade 8	ENGLISH LANGUAGE ARTS					MATHEMATICS			Social Studies	Science
	Reading	Written Expression	CONVENTIONS OF WRITING			Vocabulary	Math	Computation		
			Spelling	Capitalization	Punctuation					
Percent Completing Test	97	99	98	96	94	99	99	95	99	98
Percent Completing 75% of Test	99	99	99	99	96	99	99	98	99	99

**Table 11 (continued): Percent Completing Each Subtest
Iowa Assessments—Form F, Levels 9 – 17/18**

Level 15 Grade 9	ENGLISH LANGUAGE ARTS			MATHEMATICS		Social Studies	Science
	Reading	Written Expression	Vocabulary	Math	Computation		
Percent Completing Test	99	99	96	98	94	99	98
Percent Completing 75% of Test	99	99	98	99	98	99	99

**Table 11 (continued): Percent Completing Each Subtest
Iowa Assessments—Form F, Levels 9 – 17/18**

Level 16 Grade 10	ENGLISH LANGUAGE ARTS			MATHEMATICS		Social Studies	Science
	Reading	Written Expression	Vocabulary	Math	Computation		
Percent Completing Test	99	99	99	98	94	95	99
Percent Completing 75% of Test	99	99	99	99	98	99	99

**Table 11 (continued): Percent Completing Each Subtest
Iowa Assessments—Form F, Levels 9 – 17/18**

Level 17/18 Grade 11/12	ENGLISH LANGUAGE ARTS			MATHEMATICS		Social Studies	Science
	Reading	Written Expression	Vocabulary	Math	Computation		
Percent Completing Test	99	98	98	99	96	99	99
Percent Completing 75% of Test	99	99	99	99	98	99	99