Iowa Assessments Standard Setting Technical Report

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Prepared by
Data Recognition Corporation

DATA RECOGNITION

DRC

CORPORATION

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1. Executive Summary

The standard setting for the Iowa Assessments was conducted by Data Recognition Corporation (DRC) using a Modified Angoff procedure (Angoff, 1971; Livingston & Zieky, 1982) during a standard setting meeting held in West Des Moines, Iowa, on April 2-4, 2013. The purpose of the meeting was to develop and recommend two raw cut scores for each of the Reading and Mathematics assessments at Grades 3 through 8, 10, and 11, and for the Science assessments at Grades 5, 8, and 11. The two raw cut scores for each subject/grade combination place students into three achievement levels: Not Proficient, Proficient, and Advanced.

With the help of the Iowa Department of Education, DRC recruited panelists from across the state and targeted educators who had experience in reading, mathematics, or science at a specific grade level, and were knowledgeable about content standards. A total of 52 educators attended the Reading standard setting, 28 educators attended the Mathematics standard setting, and 40 educators attended the Science standard setting. For Reading and Mathematics, those 52 and 28 panelists, respectively, participated in two or three grade-level panels based on their experience. For Science, those 40 panelists participated in the Grade 5, Grade 8, or Grade 11 panel. The numbers of the panelists in each grade panel ranged from 8 to 20.

The Iowa Assessments standard setting meeting included a training session and three rounds of a Modified Angoff procedure for each subject/grade combination. The results will be provided in Section 5. Table 1.1 summarizes final recommended raw cut scores based on the standard setting meeting, as well as the percent of students that would fall into each achievement level based on these raw cut scores. This impact data consisted of students who took the Spring 2012 administration of the Iowa Assessments.

Table 1.1
Recommended Raw Cut Scores and Spring 2012 Achievement Level Percentages

			Raw Cut Scores		Achievement Level Percentages based on Spring 2012		
Subject	**Grade**	***N* of Items**	**Not Proficient/ Proficient**	**Proficient/ Advanced**	**Not Proficient**	**Proficient**	**Advanced**
Reading	**3**	41	21	34	24	51	25
	4	42	20	37	16	65	19
	5	43	23	38	21	63	16
	6	44	25	37	27	47	26
	7	45	21	39	15	63	22
	8	46	27	42	30	56	14
	10	40	20	35	25	52	23
	11	40	25	37	31	52	17
Mathematics	**3**	50	30	41	41	47	12
	4	55	29	48	25	70	5
	5	60	40	50	54	35	11
	6	65	37	54	41	48	11
	7	70	40	60	41	49	10
	8	75	52	68	62	34	4
	10	40	18	35	41	55	37
	11	40	23	35	68	27	5
Science	**5**	37	17	31	16	76	8
	8	43	28	40	58	41	1
	11	48	22	38	32	57	11

2. Introduction

2.1 Standard Setting Overview

A standard setting for the Iowa Assessments was conducted by DRC using a Modified Angoff procedure during a standard setting meeting held in West Des Moines, Iowa, on April 2-4, 2013. The meeting occurred over the course of three days. At the start of Day 1, training was conducted for all Reading and Mathematics panelists in a large-group setting. Following training, panelists split into grade-level groups. Over the course of the standard setting meeting, each Reading and Mathematics panelist participated in setting the standards for Grades 3 and 4, Grades 6 and 7, or Grades 10 and 11, with the standards for Grades 4, 7, and 10 set on Day 1 and the standards for Grades 3, 6, and 11 set on Day 2. Based on experience and comfort level with the grade-level content, many of the panelists from these three grade groupings continued to work on setting standards for Grades 5 and 8 on Day 3. On Day 2, training was conducted for all Science panelists in a large-group setting before splitting into grade-level groups. A DRC room facilitator led the grade-level groups through three rounds of a Modified Angoff standard setting procedure to determine recommended raw cut scores for the Iowa Assessments. Appendix A provides the agendas for each subject.

2.2 Purpose and Objectives

The purpose of the standard setting meeting was to establish cut scores for the Reading and Mathematics assessments at Grades 3 through 8, 10, and 11 and for the Science assessments at Grades 5, 8, and 11. The two cut scores for each subject/grade combination place students into three achievement levels: Not Proficient, Proficient, and Advanced.

3. Preparation for the Standard Setting Meeting

3.1 Panelist Recruitment

DRC and the Iowa Department of Education recruited educators, non-educators with subject matter expertise, special education instructors, English as a Second Language (ESL) specialists, curriculum specialists, representatives from higher education, and other stakeholders in Iowa to participate in the standard setting meeting. In March 2013, after obtaining approval from the Iowa Department of Education, DRC sent online invitations to the superintendents or principals in all school districts in Iowa, asking them to forward the invitation on to their district staff. DRC also sent invitations directly to teachers and other educators who had participated in National Assessment of Educational Progress (NAEP) activities, as identified by the Iowa Department of Education. Additionally, the Iowa Department of Education's director included the invitation to participate in the standard setting meeting in a monthly newsletter.

As a result, 120 panelists attended the standard setting meeting. Table 3.1.1 contains the summarized information about the characteristics of the selected panelists by subject based on their self-reported responses to the Participant Survey (see Appendix B for a sample Participant Survey). As can be seen from this table, most of the panelists were classroom teachers. A few were non-teacher educators. While there were more females than males, this reflects the larger proportion of female teachers in Iowa schools. The amount of experience varied greatly across panelists, with the majority having over 15 years of teaching experience.

Table 3.1.1
Self-reported Demographic Composition of Panelists by Subject

Demographic		Number of Panelists			
		Reading	Mathematics	Science	Total
Total		**52**	**28**	**40**	**120**
Gender*	Male	4	6	7	17
	Female	48	22	32	102
Ethnicity*	American Indian	0	0	0	0
	Asian	1	0	0	1
	Haw/Pac Is	0	0	0	0
	African Am	0	0	0	0
	Latino/Hispanic	2	0	0	2
	Multi-Racial	0	0	0	0
	White/Non-Hispanic	49	28	38	115
Current Assignment*	Classroom Teacher	31	13	26	70
	Educator (Non-Teacher)	17	11	11	39
	Other	4	4	2	10
Work Setting*	Urban	13	9	12	34
	Suburban	8	16	11	35
	Rural	28	12	13	53
Years Teaching	0-5	5	1	2	8
	6-10	9	6	8	23
	11-15	9	9	9	27
	16-20	5	6	10	21
	21-25	6	2	4	12
	26-30	6	2	3	11
	31+	12	2	4	18

*Some panelists chose not to provide this information.

3.2 Materials Preparation

Standard setting materials were developed and printed by DRC. Following is a list of materials made available to panelists during the meeting:

- Training Materials
- Achievement Level Descriptors
- Spring 2012 Test Form
- Ordered Item Booklet
- Item Information Sheet
- Item Separation Chart

- Person Separation Chart
- Student Score Distribution Chart
- Participant Classification Forms

Training materials, including a sample ordered item booklet, item information sheet, item separation map, and classification form were developed and printed by DRC staff. The training materials were developed using items and item data from the NAEP website. See Section 4.1 for additional information about training.

DRC's team of content experts drafted the **achievement level descriptors** (ALDs) for Reading and Mathematics Grades 3 through 8, 10, and 11 and Science Grades 5, 8, and 11, following industry best practices and guidelines by educational research organizations such as the National Center for the Improvement of Educational Assessment, the National Council of Teachers of English, the International Reading Association, the National Council of Teachers of Mathematics, and the National Science Teachers Association. The ALDs were developed for three achievement levels, Not Proficient, Proficient, and Advanced, to convey the degrees of student achievement and what students know and can do associated for each achievement level. ALDs are provided in Appendix C.

The primary means for presenting test items to panelists for judgment is via the **ordered item booklet** (OIB). In the OIB, items are placed in order of their difficulties, going from the easiest item on the first page to the hardest item on the last page. The OIBs used for the standard setting meeting consisted of all items from the Spring 2012 operational forms of the Iowa Assessments. Item difficulty indices (*p*-values) were computed using data from the Spring 2012 administration. The Iowa Assessments consist of all multiple-choice items, where, the *p*-value was estimated using the proportion of students answering that item correctly. Table 3.2.1 provides the number of items, and thus pages, in each OIB.

Table 3.2.1
Number of Items in the Ordered Item Booklets

Subject	Grade	Number of Items in OIB
Reading	**3**	41
	4	42
	5	43
	6	44
	7	45
	8	47
	10	40
	11	40
Mathematics	**3**	50
	4	55
	5	60
	6	65
	7	70
	8	75
	10	40
	11	40
Science	**5**	37
	8	43
	11	48

Each panelist received an **item information sheet** and an **item separation chart** to provide them with additional information about the items. The item information sheet displayed the *p*-value, answer key, and subskill associated with each page of the OIB, while the item separation chart provided a visual representation of the item difficulties across items in the OIB.

The **student score distribution chart** and **person separation chart** provided a visual representation of the scores of the student population on each subject/grade assessment. The student score distribution chart shows the relative frequency of each raw score on the test and the person separation chart displays the cumulative frequency.

During each round of the standard setting, panelists provided classifications for each item on the **item classification sheet**. Recommended raw cut scores were determined based on the information that panelists provided on these sheets. Details on the standard setting procedures are provided in Section 4.

Sample materials can be seen in the training presentation in Appendix D.

4. Standard Setting Procedures

4.1 Training

A DRC psychometrician conducted training on the first morning of the meeting for the Reading and Mathematics panelists, and again on the morning of Day 2 for the Science panelists, who were only participating in the meeting on Day 2. A copy of the presentation given to all panelists is available in Appendix D.

The DRC psychometrician introduced the purposes and goals of the standard setting, the methods, and the roles and responsibilities of individuals involved in the meeting. Step-by-step methodology training and a practice exercise followed the detailed description of the procedures associated with the implementation of the Modified Angoff method being used. At the beginning and end of the training, a variety of administrative issues were addressed, such as the security of the test items used in the meeting.

Training materials were developed using items and item data from the NAEP website. Training materials included:

- Achievement Level Descriptors
- Ordered Item Booklet
- Item Information Sheet
- Item Separation Chart
- Participant Classification Form

At the end of the training session, panelists were encouraged to ask any questions they might have about the methodology, procedures, and documents. They were also given a Readiness Survey (see Appendix E for a sample and Appendix F for the Readiness Survey results) to confirm that they were comfortable to begin the standard setting process. Before continuing with the actual standard setting, every panelist reported that they understood the process and how to make classifications. DRC staff verified that every panelist marked that they were ready before proceeding with the standard setting.

4.2 Standard Setting Method Overview

Angoff (1971) proposed a methodology for setting standards that has been modified and used in many configurations. In one modification, panelists review each item and estimate what proportion of a hypothetical group of hypothetical borderline examinees would answer each item correctly (Livingston & Zieky, 1982; Zieky, 2012). The original Angoff Yes/No method addresses two difficulties that panelists may have in applying the aforementioned Angoff method (Impara & Plake, 1997). First, panelists may have difficulty in conceptualizing the hypothetical borderline students. Second, estimating the proportion correct may be a difficult task even for a clearly defined group of examinees. In the Yes/No method, panelists are directed to make a dichotomous (Yes or No)

judgment about whether the hypothetical borderline examinees would be able to answer each question correctly. The OIB-Angoff method (Smith & Davis, 2009) uses an Ordered Item Booklet (OIB) to reduce the complexity of panelists' task of judging item difficulties since the items are ordered by difficulty level.

A Modified Angoff method that employed an OIB and the Yes/No classifications was used to set recommended raw cut scores for the Iowa Assessments. In this method, panelists were assigned to tables and asked to review the items in the OIB one by one. For each item, they were instructed to decide whether a borderline student falling between two adjacent achievement levels would answer correctly. Only a dichotomous "Yes" or "No" response was required. In order to determine the cut scores for the different achievement levels, each panelist's "Yes" responses were totaled and those totals were considered the cut scores on the raw score scale for each panelist. The recommended raw cut scores were determined by taking the median of the table medians. The median of the medians summary helps to reduce the impact of outliers, either panelists or tables.

4.3 Standard Setting Process

After the panelists had received training, they convened with their grade-level groups and arranged themselves so that they were sitting at three tables. Each table had from two to seven panelists and a table leader was assigned at each table. The table leader would be responsible for moderating discussions at the table and presenting table discussions to the larger group. Panelists engaged in the following steps to complete the standard setting process:

- Review the operational test.
- Discuss the achievement level descriptors.
- Conduct Round 1 classifications.
- Discuss Round 1 results at the table level.
- Conduct Round 2 classifications.
- Discuss Round 2 results at the table and group level.
- Conduct Round 3 classifications.

The first formal task for panelists was to **review the operational test** at their assigned subject and grade level. The purpose of this activity was to give panelists a solid understanding of the test content and the range of item difficulty as well as a feel for the students' testing experience on the operational administration of the Iowa Assessments.

A DRC content specialist led a **discussion of the achievement level descriptors** (ALDs) that were written specifically for each subject and grade level. It was stressed that the ALDs are statements that describe the knowledge and skills expected at the middle of each of the three achievement levels, not the boundary between levels. During this discussion, panelists were asked to visualize a hypothetical student who was just barely leaving one achievement level and just barely entering the next achievement level. They

were also reminded that the data used to determine the order of the items in the OIBs were based on the Spring 2012 test administration, It was discussed that some students may not have received instruction based on the Iowa Core Standards prior to testing, and the ALDs used in the standard setting were written to describe the expectations for the Iowa Core Standards for Reading, Mathematics, and the Next Generation Science Standards.

The Modified Angoff process proceeded in three rounds. To complete **Round 1 classifications**, panelists were asked to work individually with the following materials: OIB, ALDs, item information sheet, item separation chart, person separation map, and classification sheet. The facilitator emphasized that the panelists had to work alone and that no group discussion was permitted. Panelists were directed to answer "Yes" or "No" regarding whether a borderline Not Proficient/Proficient student would answer Item 1 correctly. Once they made their classifications for Item 1, they recorded their classifications on the classification sheets. They then proceeded to Item 2 and repeated the same process. This activity continued until the panelists had recorded classifications for all of the items for the borderline Not Proficient/Proficient student on their classification sheets. When the panelists finished their classifications for the borderline Not Proficient/Proficient student, they went back to Item 1 and repeated the process for the borderline Proficient/Advanced student.

Round 1 results were computed by DRC data analysts by totaling the "Yes" classifications to determine the two cut scores for each panelist and then computing the median cut scores for each of the three tables, resulting in six table-level cut scores for each subject and grade level. Each table leader received a summary of the median cut scores for the table and feedback regarding the level of agreement, or number of "Yes" and "No" classifications for each individual item. The table leader used these Round 1 results to guide the discussion.

Following the discussion of Round 1 results, panelists made **Round 2 classifications**. Again, each panelist was directed to work individually and made all classifications for the borderline Not Proficient/Proficient student before determining classifications for the borderline Proficient/Advanced student.

Round 2 results were calculated at the table and room level. A brief table-level discussion was followed by a room-level discussion led by the DRC room facilitator. The median of the table medians for both achievement level boundaries was presented as the recommended raw cut scores for the entire room. At this time, impacts, or the percent of students that would be in each achievement level in Spring 2012, were also presented to the panelists. The panelists were reminded that the data was based on the Spring 2012 test administration, even though not all students had received instruction in the Iowa Core Standards, or the Next Generation Science Standards.

Following the discussion of Round 2 results, panelists independently made final **Round 3 classifications**. The final Round 3 classifications were considered the panelists' final raw score recommendations.

5. Results

The individual raw cut scores for each panelist from each of the three rounds of the standard setting are provided in Appendix G. The tables in the appendix include the table medians, as well as the room medians. Note that the room median results were only presented to the panelists during the Round 2 discussion.

5.1 Recommended Raw Cut Scores

The following figures and tables present the results of the standard setting for each subject/grade combination. First, the Reading results are presented as the percent of students tested in Spring 2012 falling into each achievement level: Not Proficient, Proficient, and Advanced. These are followed by the results for Mathematics and Science. Within each subject, the results are provided beginning with Grade 3 and ending with Grade 11. Figure 5.1.1 presents the results of Round 2 for Reading. All grades are shown in the same figure to help interpret changes across grade in the percent of students falling into the Not Proficient, Proficient, and Advanced categories. Figure 5.1.2 presents the results of Round 3, expressed as the percent of students falling into the three achievement levels groups defined by the panelists' final recommendations for the Reading raw cut scores. To facilitate comparisons of the percents of students in the three achievement levels across rounds, the two graphs are combined into a single graph. In Figure 5.1.3, the Round 2 and Round 3 results for each grade are placed in adjacent columns.

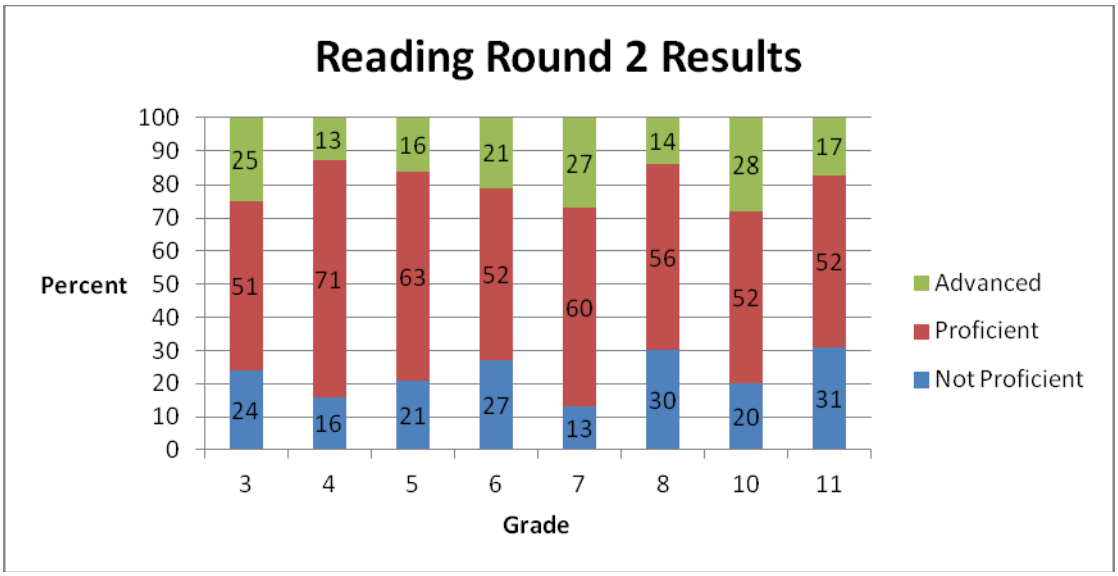


Figure 5.1.1. **Reading Round 2 Results – All Grades**

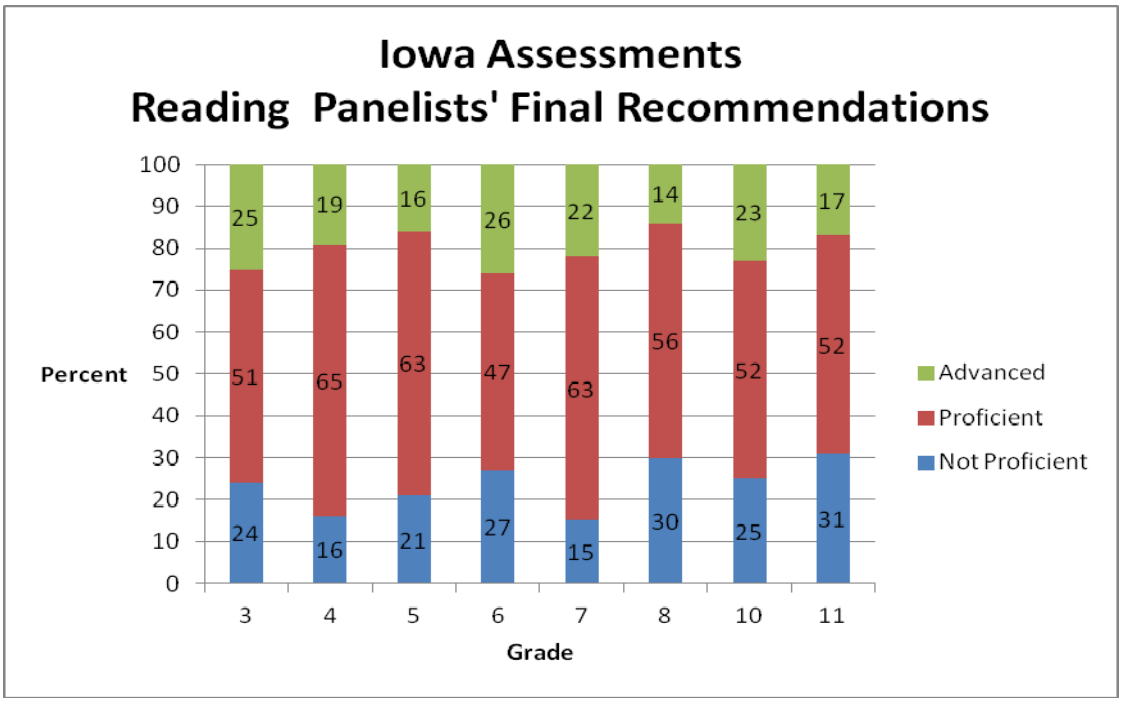


Figure 5.1.2. **Reading Round 3 Results – All Grades**

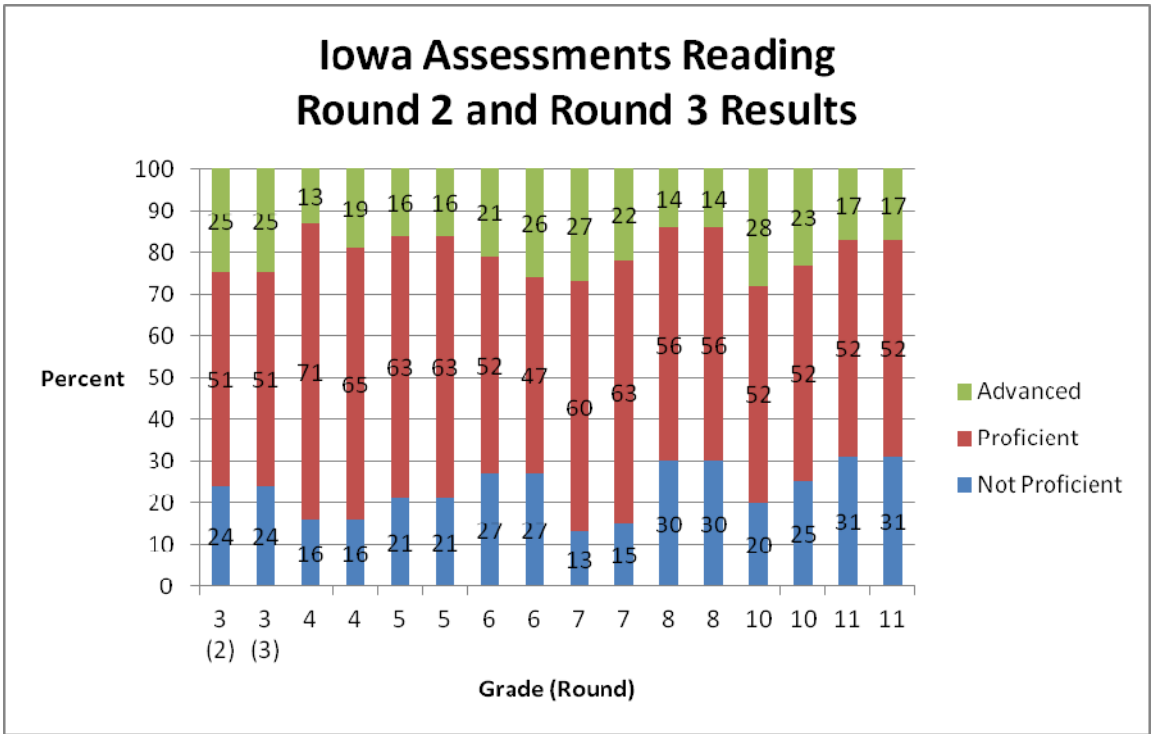


Figure 5.1.3. **Reading Round 2 and Round 3 Results – All Grades**

The Round 2 and Round 3 results in Figure 5.1.3 are very similar across the rounds for all grades, with almost identical percents of Not Proficient, Proficient, and Advanced students in Round 2 and Round 3.

Table 5.1.1 contains the recommended Reading raw cut scores based on the Round 3 results using the median of the table medians method.

Table 5.1.1
Reading Recommended Raw Cut Scores

		Raw Cut Scores	
Grade	*N* of Items	Not Proficient/ Proficient	Proficient/ Advanced
3	41	21	34
4	42	20	37
5	43	23	38
6	44	25	37
7	45	21	39
8	46	27	42
10	40	20	35
11	40	25	37

Figure 5.1.4 presents the results of Round 2 for Mathematics as the percent in each achievement level. All grades are shown in the same figure to help interpret changes across grades in the percents of students falling into the Not Proficient, Proficient, and Advanced categories. Figure 5.1.5 presents the results of Round 3, expressed as the percent of students falling into the three achievement levels defined by the panelists' final recommendations for Mathematics. To facilitate comparisons of the percents of students in the three achievement levels across rounds, the two graphs are combined into a single graph. In Figure 5.1.6, the Round 2 and Round 3 results for each grade are placed in adjacent columns.

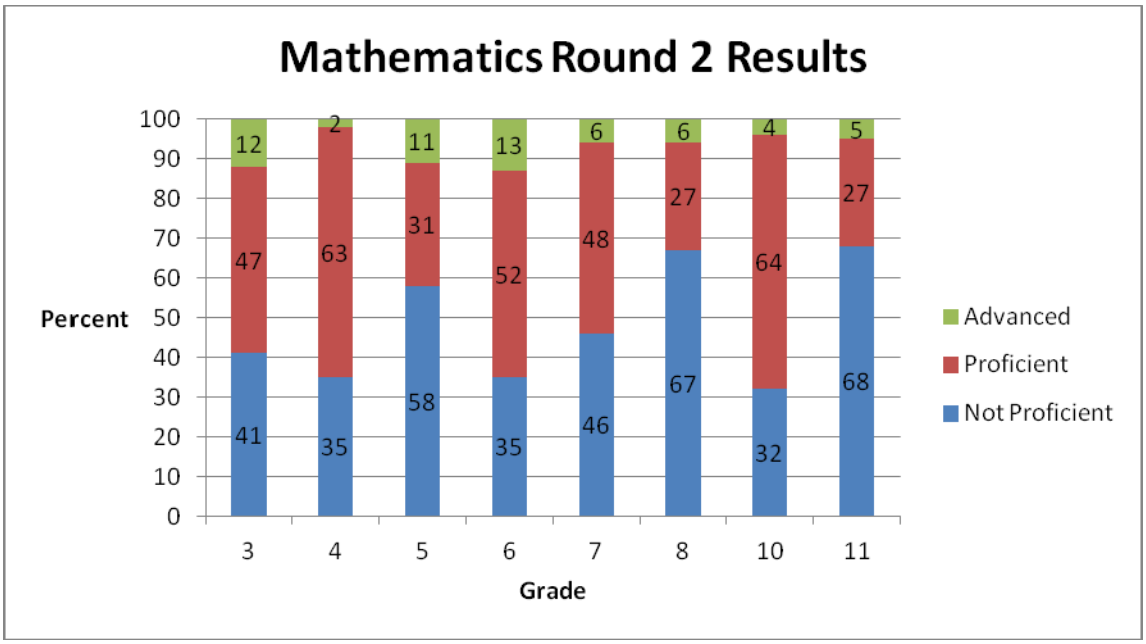


Figure 5.1.4. **Mathematics Round 2 Results – All Grades**

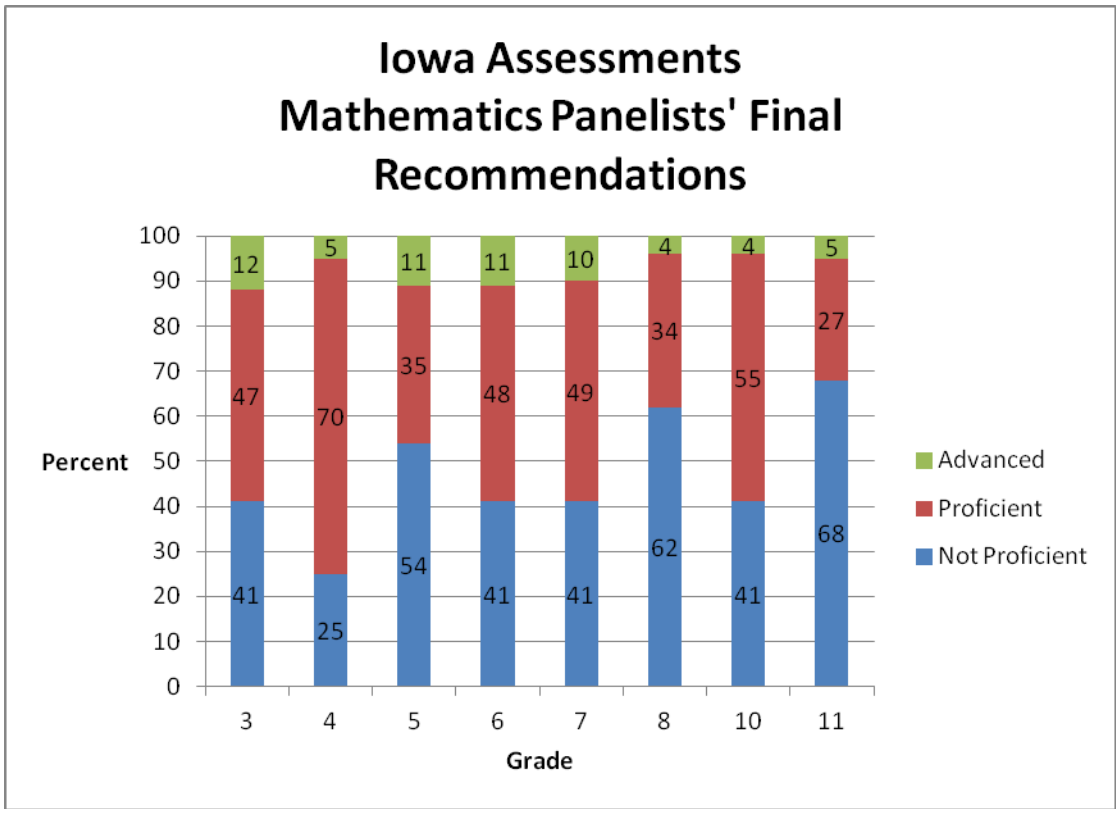


Figure 5.1.5. **Mathematics Round 3 Results – All Grades**

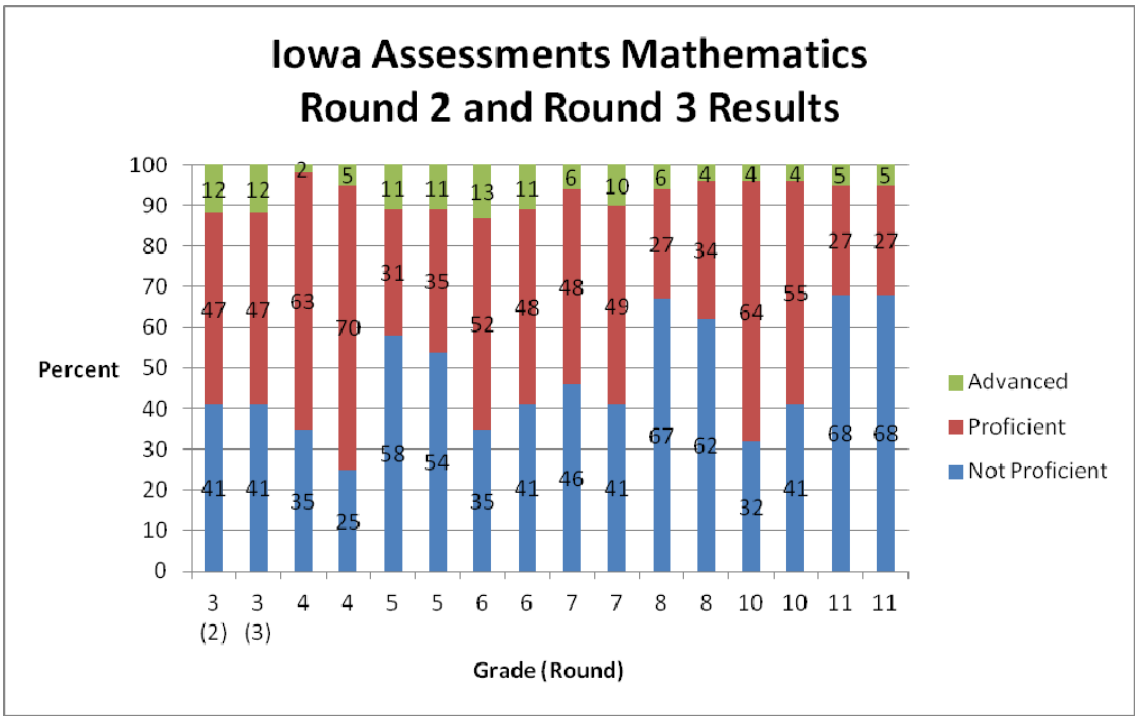


Figure 5.1.6. **Mathematics Round 2 and Round 3 Results – All Grades**

The Mathematics Round 2 and Round 3 results in Figure 5.1.6 are less consistent than Reading across the rounds, with changes of up to 9 percent difference in the percent of students classified as Not Proficient and Proficient across the two rounds for some grades.

Table 5.1.2 contains the recommended Mathematics raw cut scores based on the Round 3 results using the median of the table medians method.

Table 5.1.2
Mathematics Recommended Raw Cut Scores

		Raw Cut Scores	
Grade	***N* of Items**	**Not Proficient/ Proficient**	**Proficient/ Advanced**
3	50	30	41
4	55	29	48
5	60	40	50
6	65	37	54
7	70	40	60
8	75	52	68
10	40	18	35
11	40	23	35

Figure 5.1.7 presents the results of Round 2 for Science. All Science grades are shown in the same figure to help interpret changes across grade in the percents of students falling into the Not Proficient, Proficient, and Advanced categories. Figure 5.1.8 presents the results of Round 3, expressed as the percent of students falling into the three achievement levels defined by the panelists' final recommendations for Science. To facilitate comparisons of the percent of students in the three achievement levels, the two graphs are combined into a single graph. In Figure 5.1.9, the Round 2 and Round 3 results for each grade are placed in adjacent columns.

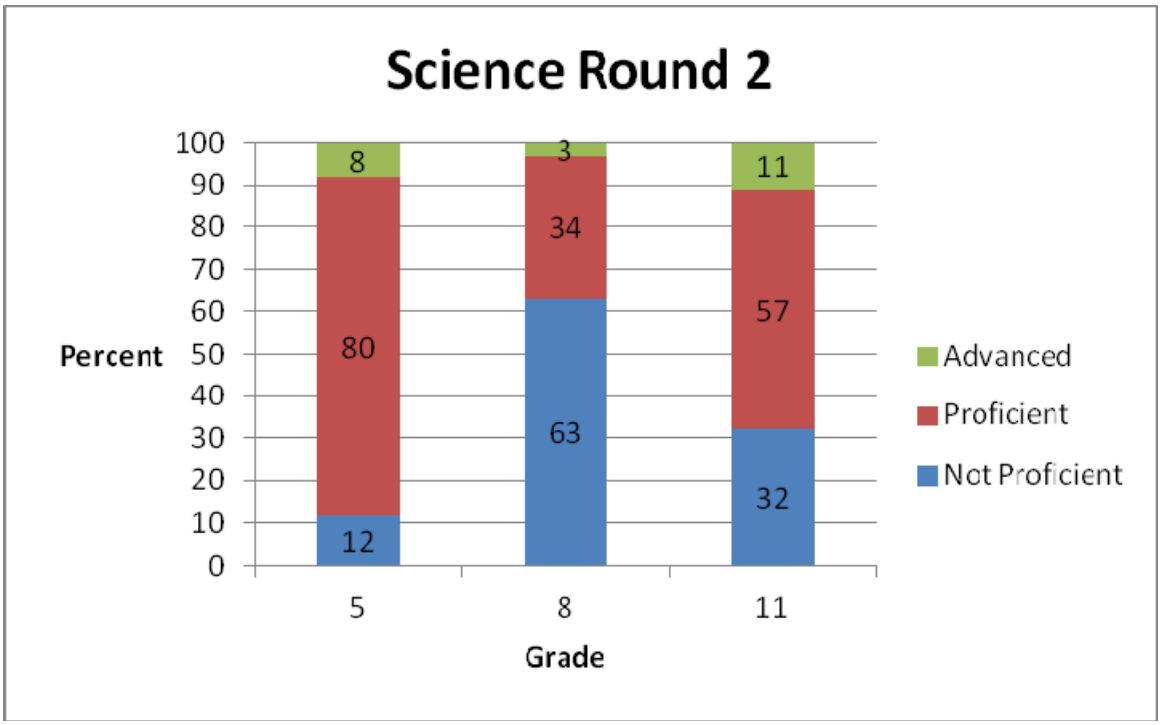


Figure 5.1.7. **Science Round 2 – All Grades**

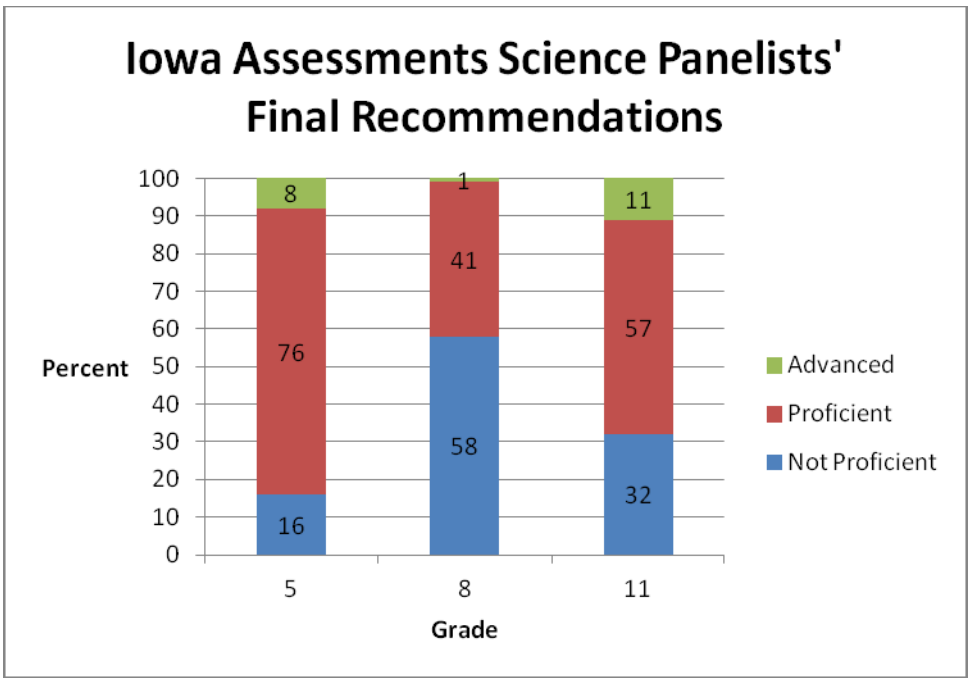


Figure 5.1.8. **Science Round 3 Results – All Grades**

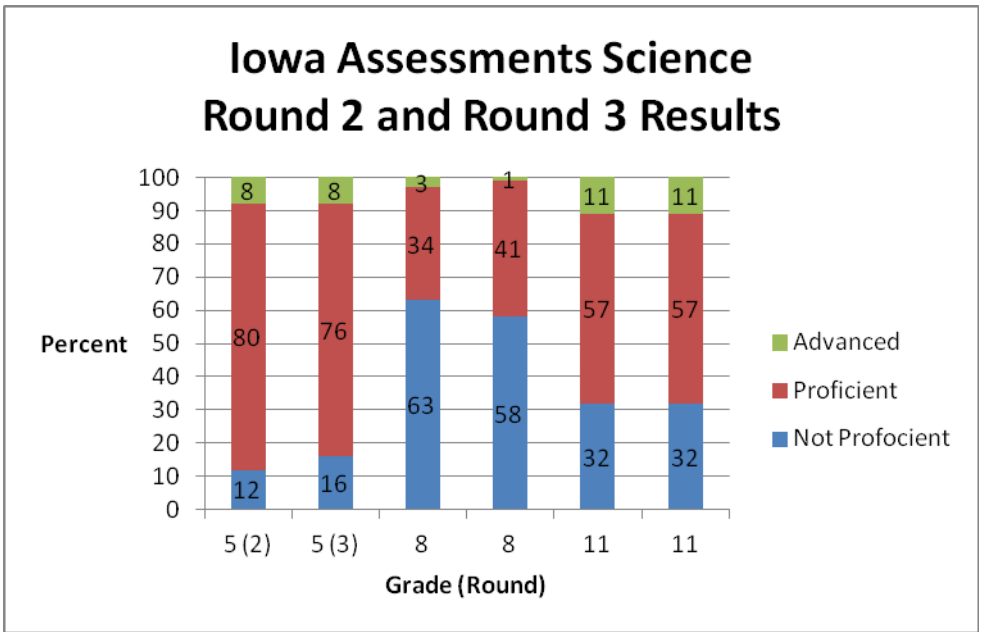


Figure 5.1.9. **Sciences Round 2 and Round 3 Results – All Grades**

The Round 2 and Round 3 results in Figure 5.1.9 are very similar across the rounds, with almost identical percents of Not Proficient, Proficient, and Advanced students across the second and third rounds. However, the results for Grades 5, 8, and 11 vary quite markedly, with the Grade 8 percent of Not Proficient students much higher than those identified for Grades 5 and 11.

Table 5.1.3 contains the recommended Science raw cut scores based on the Round 3 results using the median of the table medians method.

Table 5.1.3
Science Recommended Raw Cut Scores

		Raw Cut Scores	
Grade	*N* of Items	Not Proficient/ Proficient	Proficient/ Advanced
5	37	17	31
8	43	28	40
11	48	22	38

5.2 Further Analysis

A series of additional analyses were performed on the Round 3 data to determine if methodological factors might have introduced the inconsistencies across rounds for Mathematics. The first of these analyses looked at the method of describing the central tendency of the recommended raw cut scores.

5.2.1 Comparison of Cut Score Methodologies

To further understand the impact of using alternative methodologies for summarizing the individual panelist's recommended raw cut scores into a single value, four methodologies were used to estimate the recommended raw cut scores. The first methodology was the median of the table medians that was reported in Section 5.1. The second methodology was to calculate the median across all panelists without considering table placement. The third methodology was to calculate the mean of the table means. Here, the mean replaces the median as the measure of central tendency found in the first methodology and retains the table format to reduce the effect of outliers. The final methodology was to simply take the mean across all panelists without considering table placement. These results were calculated for the Mathematics tests across all grades, using the pamelists' Round 3 recommendations in the calculations.

The comparison of the four methodologies to summarize central tendency for Grade 3 Mathematics is found in Figure 5.2.1.1. These results show a range of 9 percent difference across the four methodologies for the Not Proficient group and a range of 5 percent for the Proficient group. In this case, the median of the table medians summary minimizes the Not Proficient group and maximizes the Proficient group. Also, the percent of students in the Not Proficient category increases with use of the mean in both methods, rather than the median, for this grade.

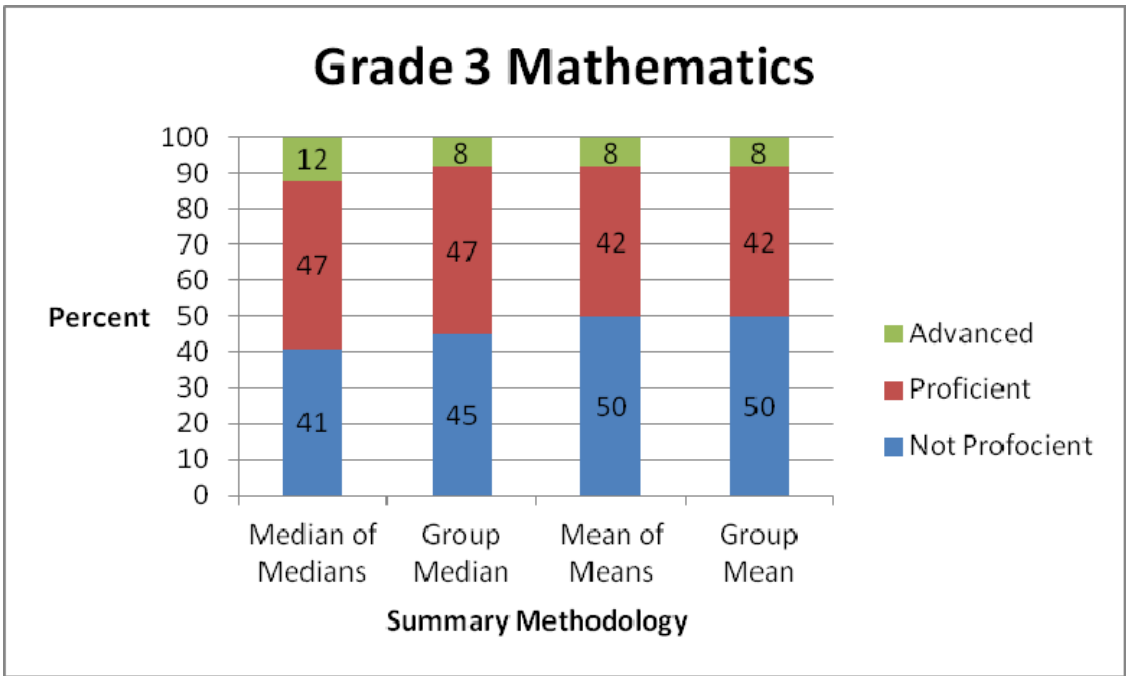


Figure 5.2.1.1. **Methodology Comparison – Grade 3 Mathematics**

The comparison of the four methodologies to summarize central tendency for Grade 4 Mathematics is found in Figure 5.2.1.2. These results show a range of 3 percent difference across the four methodologies for the Not Proficient group and a range of 3 percent for the Proficient group. In this case, the median of the medians summary minimizes the Not Proficient group but does not maximize the Proficient group. There appears to be no significant change with use of the mean rather than the median for this grade.

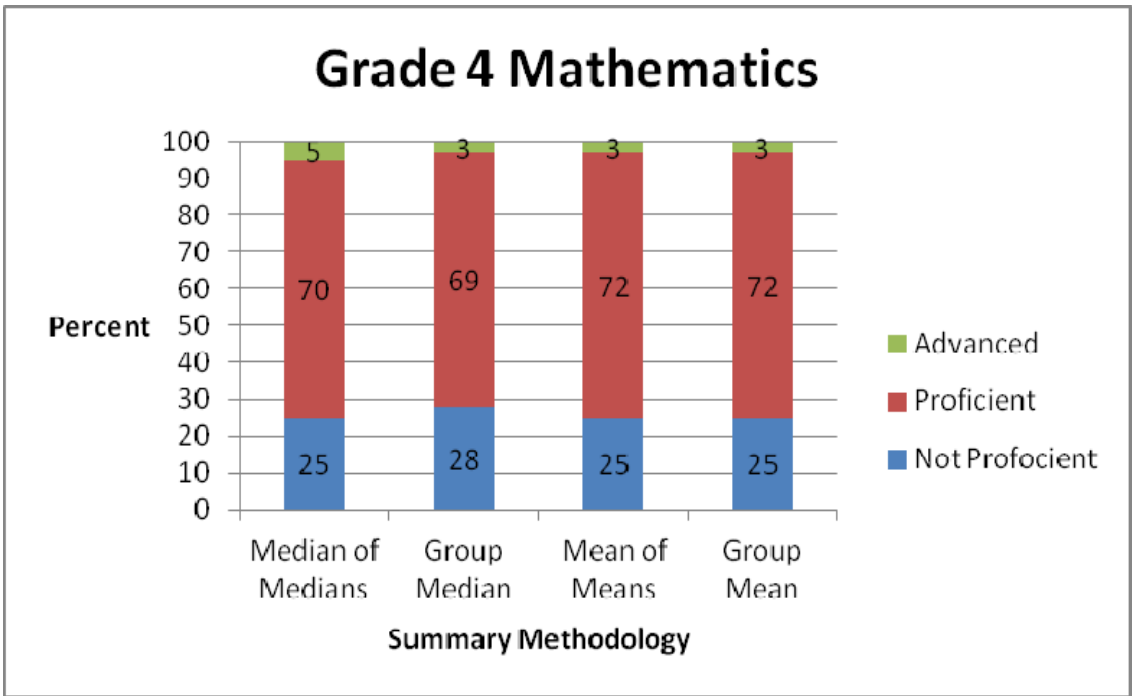


Figure 5.2.1.2. **Methodology Comparison – Grade 4 Mathematics**

The comparison of the four methodologies to summarize central tendency for Grade 5 Mathematics is found in Figure 5.2.1.3. These results show a range of 4 percent difference across the four methodologies for the Not Proficient group and no difference for the Proficient group. In this case, the median of the medians summary minimizes the Not Proficient group, does not impact the Proficient group, and maximizes the Advanced group. There appears to be no significant change with use of the mean rather than the median for this grade.

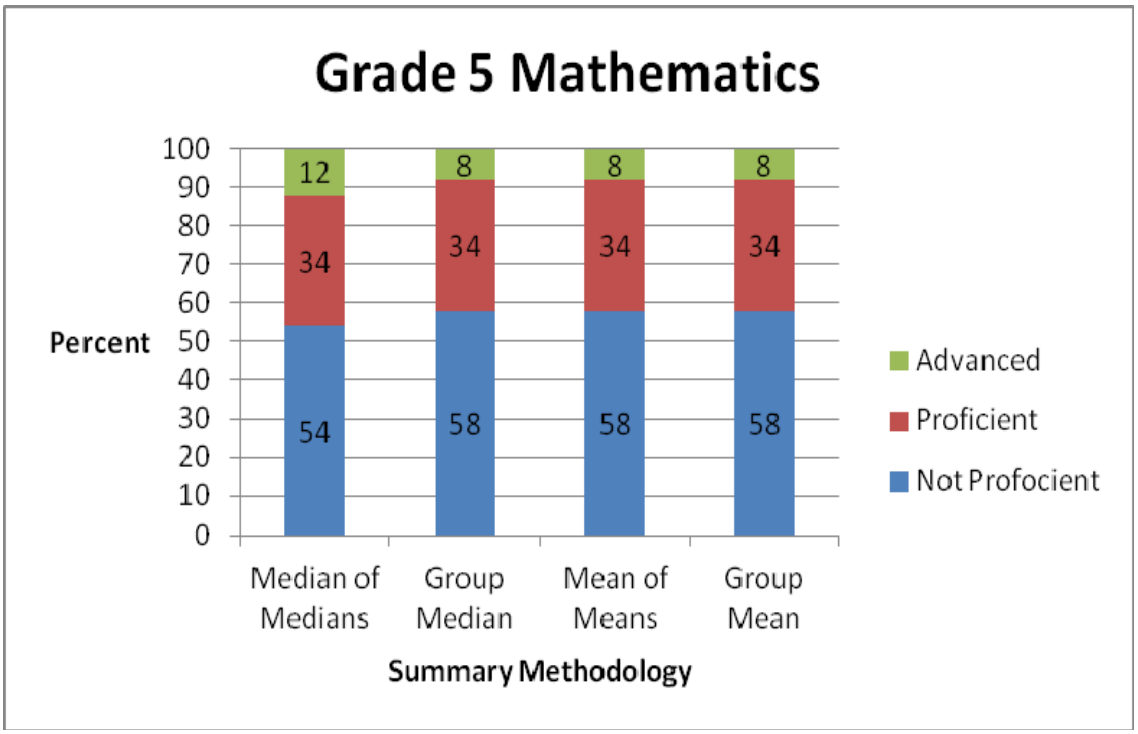


Figure 5.2.1.3. **Methodology Comparison – Grade 5 Mathematics**

The comparison of the four methodologies to summarize central tendency for Grade 6 Mathematics is found in Figure 5.2.1.4. These results show a range of 3 percent difference across the four methodologies for the Not Proficient group and a range of 1 percent difference for the Proficient group. In this case, the median of the medians summary, along with two other methods, minimizes the Not Proficient group and maximizes the Proficient group. There appears to be no significant change with use of the mean rather than the median for this grade.

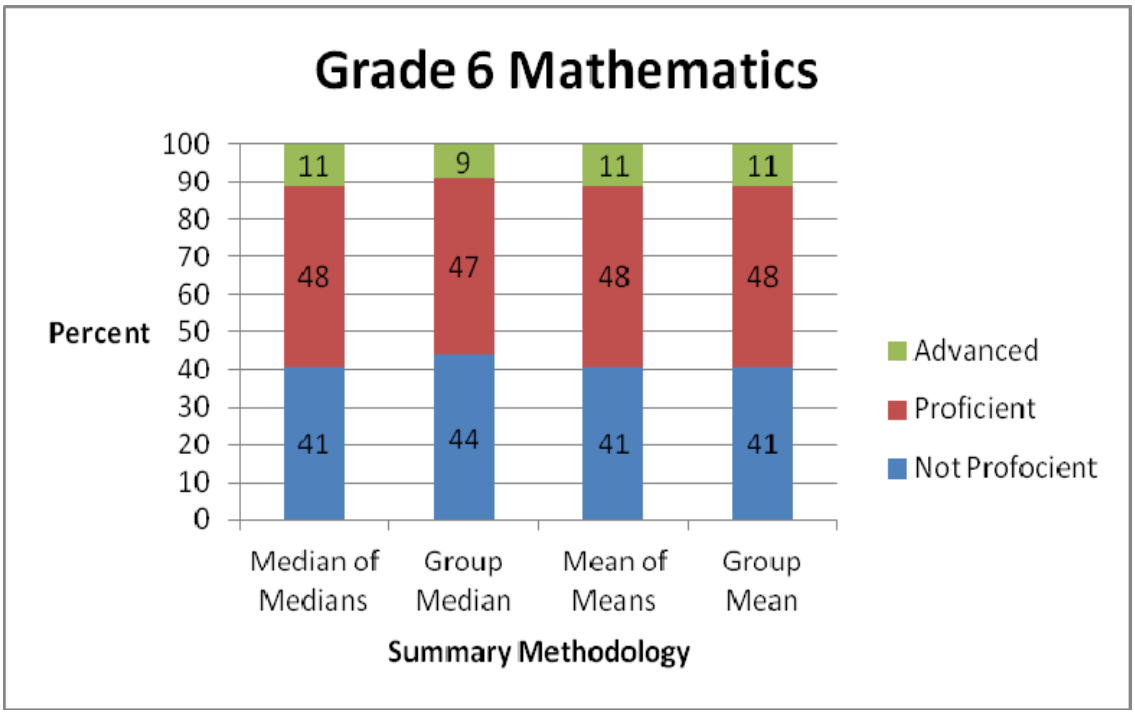


Figure 5.2.1.4. **Methodology Comparison – Grade 6 Mathematics**

The comparison of the four methodologies to summarize central tendency for Grade 7 Mathematics is found in Figure 5.2.1.5. These results show a range of 3 percent difference across the four methodologies for the Not Proficient group and a range of 3 percent difference for the Proficient group. In this case, the median of the medians summary minimizes the Not Proficient group and maximizes the Proficient group. There appears to be no significant change with use of the mean rather than the median for this grade.

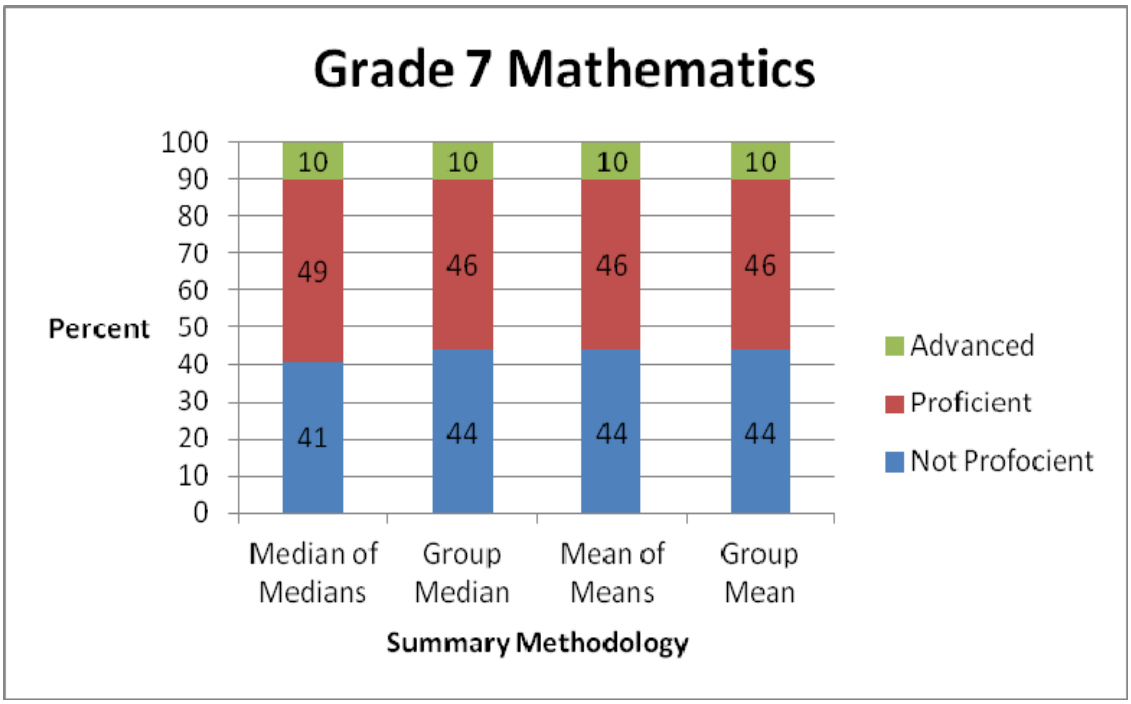


Figure 5.2.1.5. **Methodology Comparison – Grade 7 Mathematics**

The comparison of the four methodologies to summarize central tendency for Grade 8 Mathematics is found in Figure 5.2.1.6. These results show a range of 11 percent difference across the four methodologies for the Not Proficient group and a range of 9 percent difference for the Proficient group. In this case, the group median summary minimizes the Not Proficient group and maximizes the Proficient group. There appears to be no significant change with use of either means, rather than the median of medians. But there appears to be a significant change with use of group median rather than the median of medians for this grade.

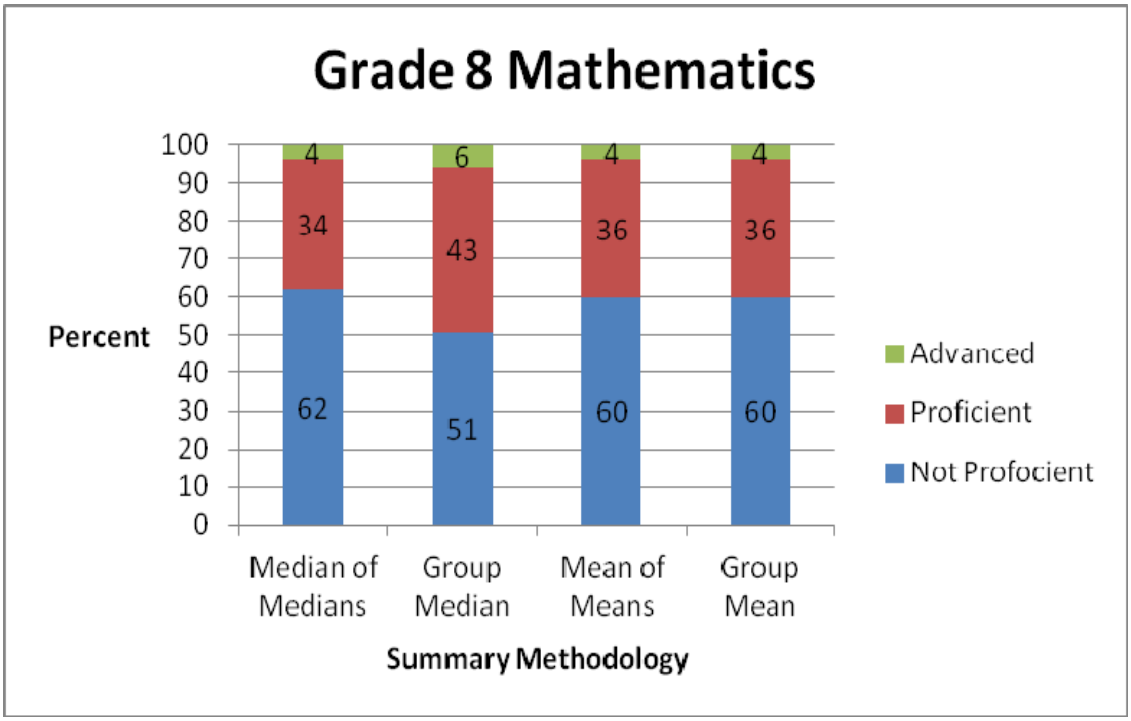


Figure 5.2.1.6. **Methodology Comparison – Grade 8 Mathematics**

The comparison of the four methodologies to summarize central tendency for Grade 10 Mathematics is found in Figure 5.2.1.7. These results show a range of 19 percent difference across the four methodologies for the Not Proficient group and a range of 19 percent difference for the Proficient group. In this case, the group median summary minimizes the Not Proficient group and maximizes the Proficient group. There appears to be a significant change with use of the mean of means rather than the group mean. There also appears to be a significant change with use of the group median rather than the median of medians for this grade.

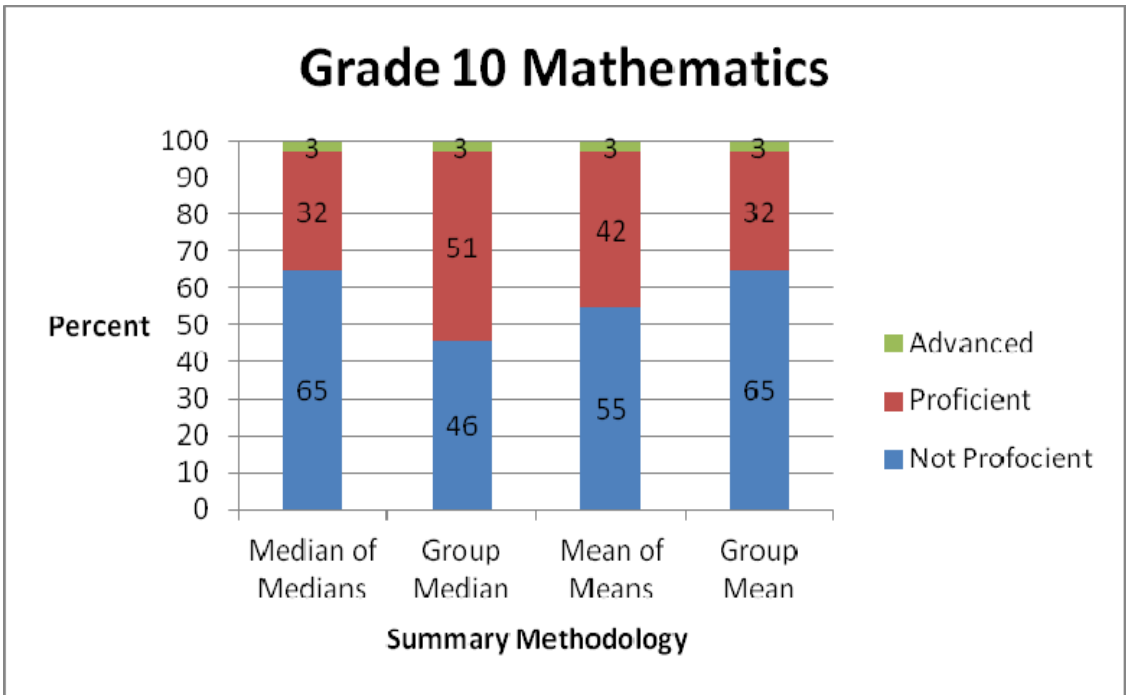


Figure 5.2.1.7. **Methodology Comparison – Grade 10 Mathematics**

The comparison of the four methodologies to summarize central tendency for Grade 11 Mathematics is found in Figure 5.2.1.8. These results show a range of 7 percent difference across the four methodologies for the Not Proficient group and range of 9 percent difference for the Proficient group. In this case, the group median summary minimizes the Not Proficient group and maximizes the Proficient group. There appears to be no difference with use of the mean of means rather than the group mean for this grade.

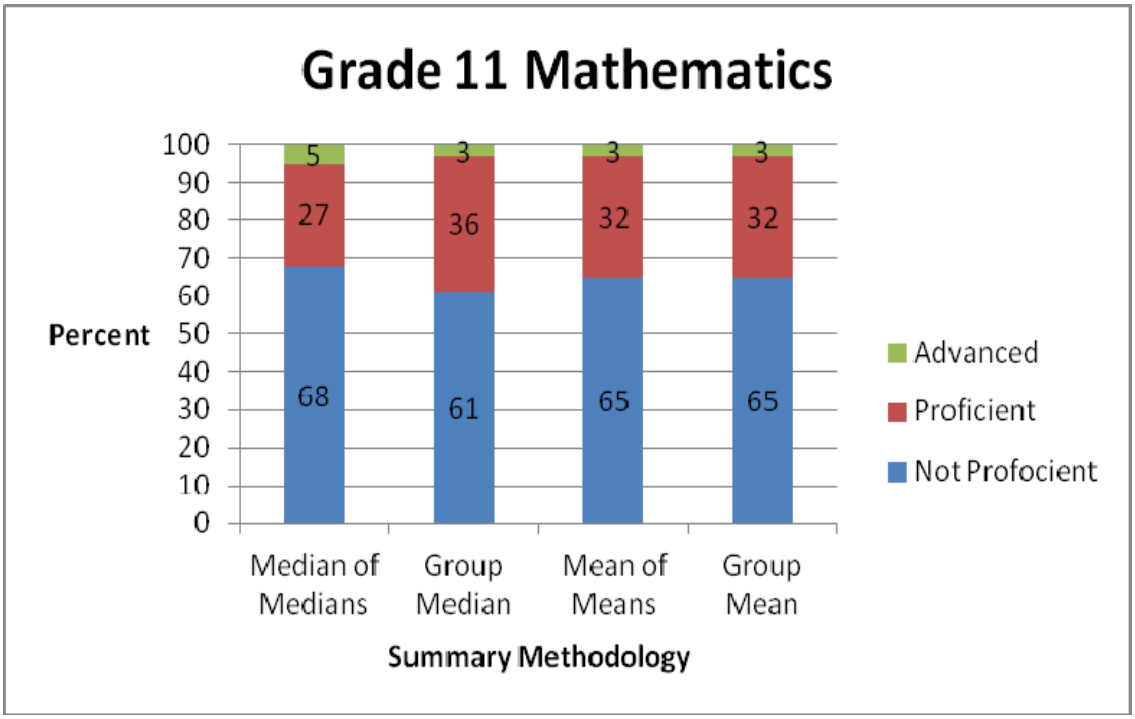


Figure 5.2.1.8. **Methodology Comparison – Grade 11 Mathematics**

Application of the four methodologies for summarizing the central tendency of the recommended raw cut scores resulted in different percents of students in the three achievement levels, mostly in the Not Proficient and Proficient levels. The results also varied across grades with some grades showing little or no change (3 percent or less) and some grades showing large changes (greater that 6 percent). The three highest grades (Grades 8, 10, and 11) all showed significant changes. These results suggest that it may not be the case that there is a single best method for summarizing the central tendency and that the consideration of other factors might be appropriate.

5.2.2 Raw Cut Score Comparisons for Common Items with Same Panelists

The three groups of Mathematics panelists saw a pair of grades (i.e., 3 and 4, 6 and 7, and 10 and 11). Because these pairs of grades shared half of the items on their form with one another, it may be useful to look at the raw cut score recommendations for only those common items. The data used were from Round 3 classifications and the raw cut scores were determined using the median of medians method previously discussed. The three rows in Table 5.2.2.1 represent the three grade combinations where the raw cut scores were determined by the same panelists. The Number of Common Items column indicates the number of items that were common across the two grade-level forms examined in the comparison. The two Raw Cut Score columns compare the raw cut score for just the common items on the two grades in the comparison. The Change columns represent the difference between the two raw cut scores in the previous column. The general expectation would be that when a higher grade level was taking a common set of items, they would perform at a higher level that the lower grade. However, this is not the case for the Grade 3 and 4 comparison of the Not Proficient/Proficient raw cut score. The Grade 3 Not Proficient/Proficient raw cut score for the common Grade 3/4 items is actually higher than the Not Proficient/Proficient raw cut score for Grade 4.

Table 5.2.2.1
Mathematics Raw Cut Scores for Common Items

Grade	*N* Common Items	Not Proficient/ Proficient Raw Cut Score	Change	Proficient/ Advanced Raw Cut Score	Change
3 4	26	17 16	-1	19.5* 23	+3.5
6 7	36	16 21	+5	23 28	+5
10 11	20	6 14	+8	15 19	+4

* Because there was an even number of panelists assigned to at least one table, the raw cut score includes a decimal.

5.2.3 Raw Cut Score Comparisons for Common Items with Different Panelists

A different configuration of panelists, although there were some common panelists, classified the items for Grades 4 and 5, Grades 5 and 6, and Grades 7 and 8. These analyses compare the raw cut score recommendations based on common items across pairs of grades (4 and 5, 5 and 6, and 7 and 8). The data were only from Round 3 classifications and the raw cut scores were determined using the median of the medians

method previously discussed. In Table 5.2.3.1, there are no negative change numbers, but the magnitude of the positive changes for the Not Proficient/Proficient cut score is less consistent than the changes in Table 5.2.2.1 or the changes for the Proficient/Advanced cut score in this table.

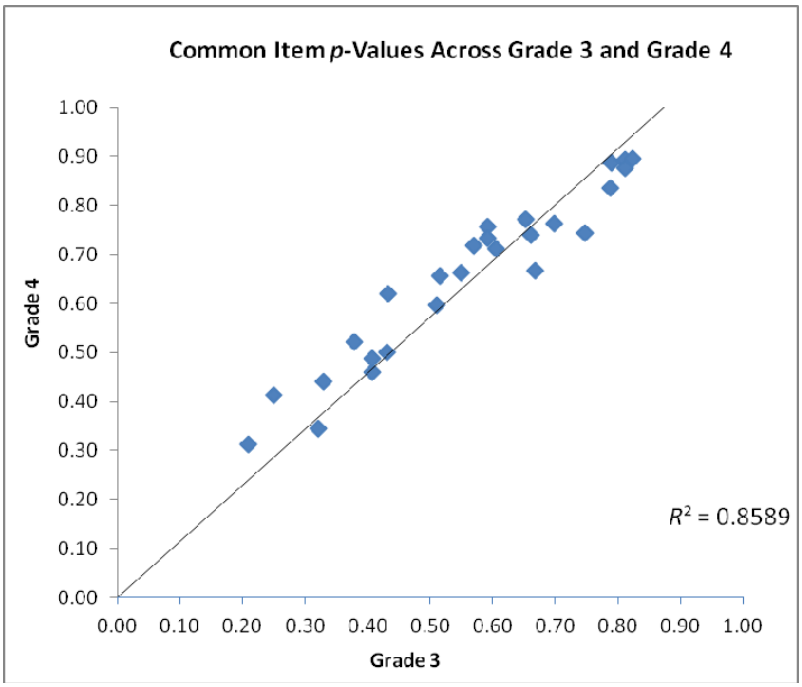
Table 5.2.3.1
Mathematics Raw Cut Scores for Common Items

Grade	*N* Common Items	Not Proficient/ Proficient Raw Cut Score	Change	Proficient/ Advanced Raw Cut Score	Change
4 5	30	12 23	+11	24.5* 27	+3.5
5 6	32	17 22	+5	23 27	+4
7 8	37	19 28.5*	+9.5	30 34	+4

* Because there was an even number of panelists assigned to at least one table, the raw cut score includes a decimal.

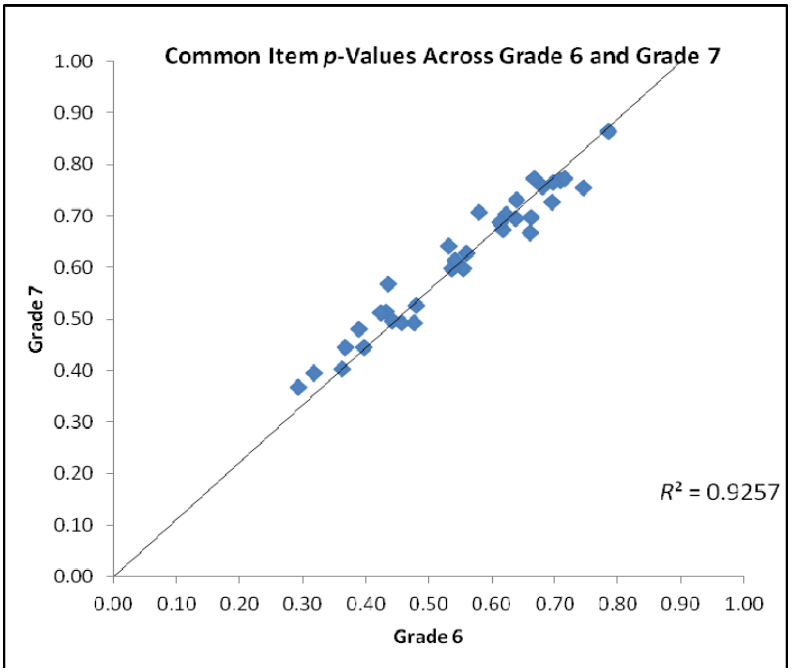
5.2.4 Common Item Difficulty Comparisons

Because there are common items across grade-level tests, it is possible to compare the performance of these items across the adjacent grade levels. The figures below show the bivariate plots of the *p*-values for the common items across adjacent grades. The recommended raw cut scores for these two grades were developed by the same set of panelists. There appears to be a common trend in these three plots. The more difficult items, with *p*-values between 0.20 and 0.70, appear to be easier for the higher grade. However, the easy items, with *p*-values higher than 0.70, appear to be easier for the lower grade than for the higher grade. This difference may be due to lack of coverage of the easier concepts in the curriculum for the higher grade and hence, a lack of practice or review of these concepts.



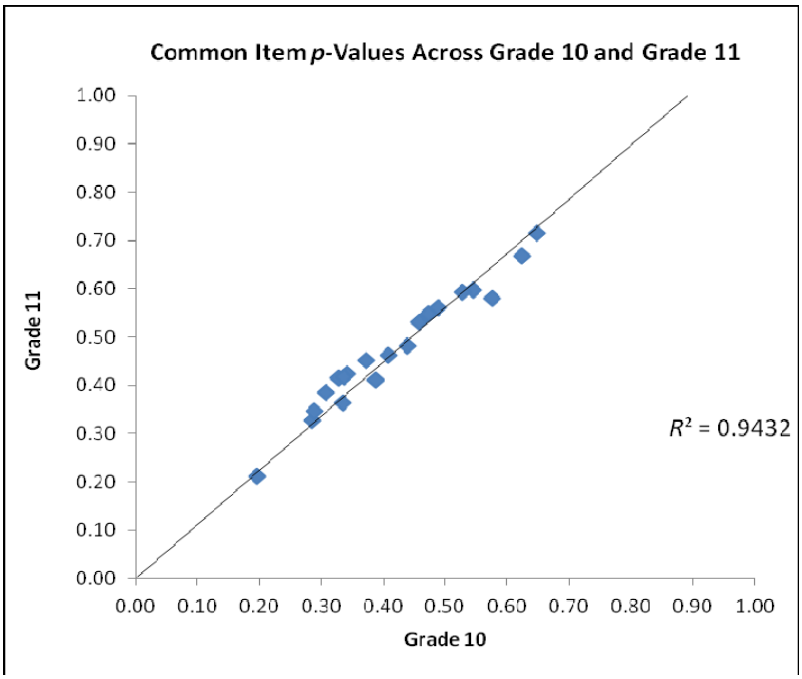
Note. Points above the unit slope line are easier for Grade 4 than Grade 3.

Figure 5.2.4.1. **Difficulty of Common Items on Grade 3 and Grade 4 Tests**



Note. Points above the unit slope line are easier for Grade 7 than Grade 6.

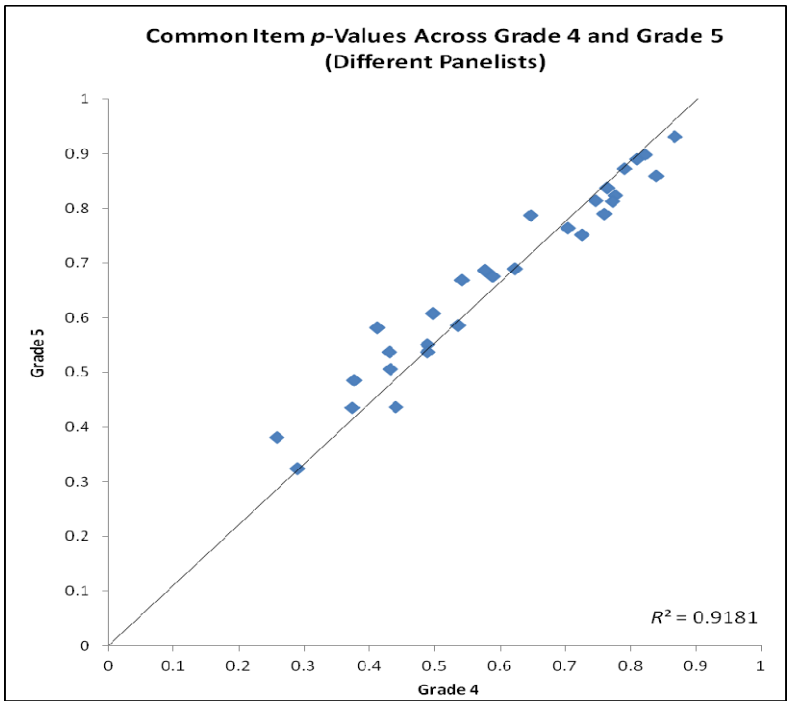
Figure 5.2.4.2. **Difficulty of Common Items on Grade 6 and Grade 7 Tests**



Note. Points above the unit slope line are easier for Grade 11 than Grade 10.

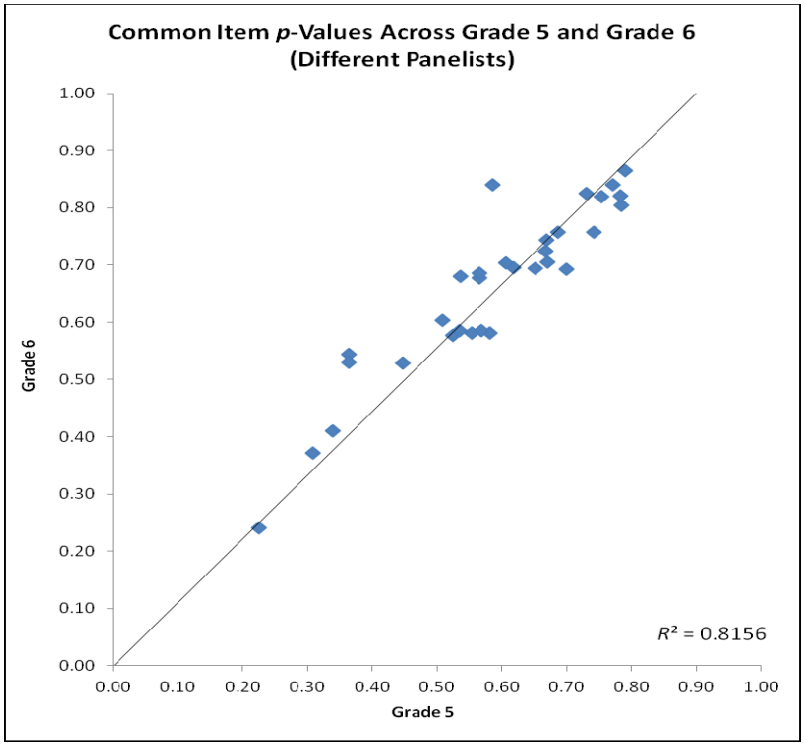
Figure 5.2.4.3. Difficulty of Common Items on Grade 10 and Grade 11 Tests

The figures below show the bivariate plots of the *p*-values for the common items across adjacent grades. The recommended raw cut scores for these two grades were developed by a different subset of panelists. There appears to be a common trend in these three plots that is very similar to the three previous plots. The more difficult items, with *p*-values between 0.20 and 0.70, appear to be easier for the higher grade. However, the easy items, with *p*-values higher than 0.70, appear to be easier for the lower grade. Again, this difference may be due to lack of coverage of the easier concepts in the curriculum for the higher grade and hence a lack of practice or review of these concepts.



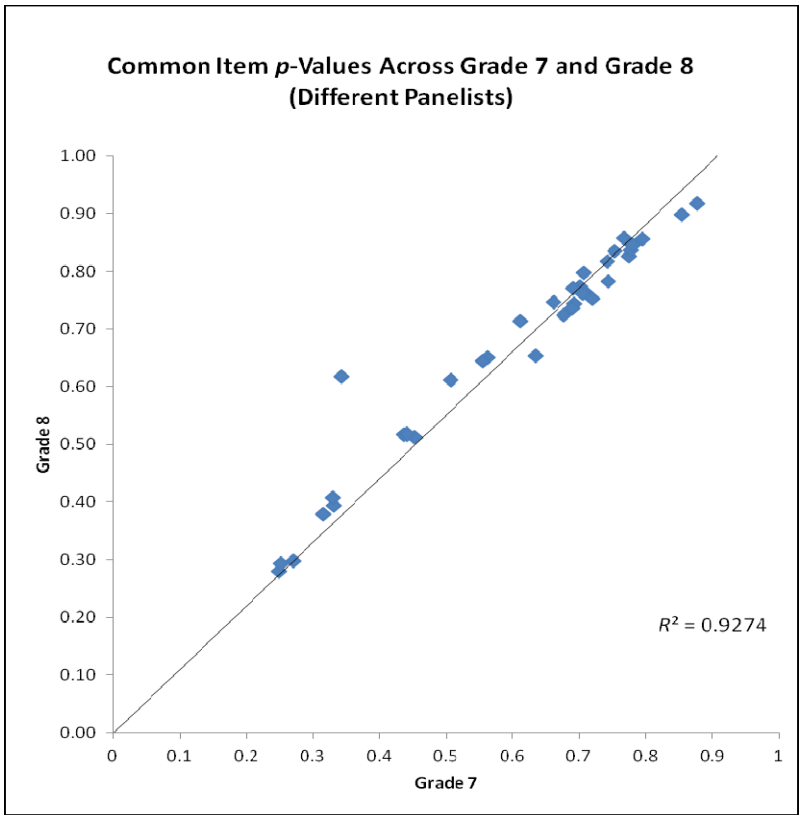
Note. Points above the unit slope line are easier for Grade 5 than Grade 4.

Figure 5.2.4.4. **Difficulty of Common Items on Grade 4 and Grade 5 Tests**



Note. Points above the unit slope line are easier for Grade 6 than Grade 5.

Figure 5.2.4.5. **Difficulty of Common Items on Grade 5 and Grade 6 Tests**



Note. Points above the unit slope line are easier for Grade 8 than Grade 7.

Figure 5.2.4.6. **Difficulty of Common Items on Grade 7 and Grade 8 Tests**

5.3 Standard Setting Evaluation Results

After making Round 3 classifications for each grade, panelists were asked to complete an evaluation on the standard setting meeting itself. This information was used to aid in measuring the panelists' confidence in their work. Appendix H provides a sample Evaluation Form, followed by detailed results of the evaluation forms in Appendix I. Some panelists chose not to answer every question on the evaluation form.

The first section of the Evaluation Form focused on the large-group training. On the first day of training, all Reading and Mathematics panelists indicated that the training was at least "Somewhat" clear. A few Science panelists found the training to be "Not at All" clear. It is important to note that before leaving the large-group training, all panelists completed the Readiness Survey and indicated that they understood the process and were ready to make the Round 1 classifications. Across the two training sessions, over two-thirds of the panelists felt that the amount of time spent on training was appropriate. Less than two percent of panelists felt that the practice exercises during the training were "Not Useful," but 58% found the practice exercises to be "Useful" and 19% found them to be "Very Useful."

The next section asked the panelists to reflect on the ALDs, including whether adequate information about the ALDs was provided, whether enough time was provided to understand the ALDs, if the ALDs capture what the students should know and be able to do, whether the ALDs communicate a reasonable profile of students at each achievement level, and whether the ALDs were helpful in making classifications. Each item within this section was rated from a 1 (Strongly Disagree) to 4 (Strongly Agree). Across all subjects and grades, the average scores on these five items ranged from 2.96 to 3.23, indicating a high level of agreement with the statements.

The third section on the Evaluation Form asked panelists to rate the level of usefulness of the various materials that they received to complete the standard setting tasks. These materials that were evaluated were: operational test book, ordered item booklet, item separation chart, item information sheet, person separation chart, student score distribution, and statistical impact data. Nearly all panelists (94% and 97%) found the operational test book and the ordered item booklet to be "useful" or "very useful." The material with the least number of panelists indicating it was useful was the person separation chart, with just over half (58%) of panelists indicating that it was "useful" or "very useful." These results demonstrate that different panelists might find different information to be useful in determining their classifications.

The fourth section asked panelists to indicate whether they thought there was "too little time" (1), "about right" (2), or "too much time" (3) allotted for their classifications for each round. Across all grades and subjects, panelists rated the time allotted for Rounds 1, 2, and 3 as an average of 2.14, 2.11, and 2.06, respectively. The comments written on the evaluation forms and the variability of these ratings within a subject/grade combination suggest that many panelists interpreted this question to be asking about the time allotted between rounds or the length of the discussion during each round.

The next section asked panelists to rate their satisfaction with the DRC psychometric lead (i.e. large-group trainer), DRC room facilitator, and other DRC staff. On a scale of 1 (Not Satisfied) to 4 (Very Satisfied) panelists reported an average satisfaction score of 3.07 for the DRC psychometric lead, 3.36 for the DRC room facilitators, and 3.13 for other DRC staff.

The final questions on the Evaluation Form asked panelists about their confidence in determining the raw cut score locations for each assessment and their overall confidence about whether the processes used will produce valid results. Across all grades and subjects, 96% of panelists indicated that they were at least "Partially Confident" with determining the Not Proficient/Proficient cut score and 97% were at least "Partially Confident" with determining the Proficient/Advanced cut score. Confidence in these two raw cut scores varied greatly across grades and subjects. On a scale where "Not Confident" is 1 and "Very Confident" is 4, average confidence ratings within a subject/grade combination varied from 1.86 in Grade 11 Science to 3.47 in Grade 5 Reading for the Not Proficient/Proficient cut score and 2.21 in Grade 11 Science to 3.65 in Grade 5 Reading for the Proficient/Advanced cut score. In general, panelists indicated being confident that the processes used would produce valid results. Across all grades

and subjects, about three-fourths of the panelists were “Confident” or “Very Confident.” Average scores on the same confidence scale ranged from 1.86 in Grade 11 Science to 3.21 in Grade 11 Reading.

6. References

Angoff, W. H. (1971). Scales, norms and equivalent scores. In R. L. Thorndike (Ed.), *Educational measurement*, (2nd ed., pp. 508-600). Washington DC: American Council on Education.

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Appendix A: Meeting Agendas

Iowa Assessments - Reading
Angoff Yes/No Standard Setting Meeting
Agenda

Monday, April 1, 2013
Hotel Check-in for those traveling long distances

Tuesday, April 2, 2013 *(times are approximate depending on work completion)*
8:00 – 8:30 Light Breakfast and Check-in
8:30 – 10:00 Training in Large Group Room Des Moines
10:15 – 12:00 Grade Group Breakouts, round 1

Reading Grade	*Room*
3, 4, 5	*Shelby*
6, 7, 8	*Hancock*
10, 11	*Woodbury*

12:00 – 1:00 Lunch

1:00 – Completion Complete rounds 2 and 3 of the Angoff Yes/No process
(Afternoon break will be determined by completion of round 2)

Wednesday, April 3, 2013 *(times are approximate depending on work completion)*
8:00 – 8:30 Light Breakfast and Check-in
8:30 – 11:45 Grade Group Breakouts, round 1

Reading Grade	*Room*
3, 4	*Shelby*
5, 6, 7	*Hancock*
8, 10, 11	*Woodbury*

11:45 – 12:45 Lunch

12:45 – Completion Complete rounds 2 and 3 of the Angoff Yes/No process
(Afternoon break will be determined by completion of round 2)

Thursday, April 3, 2013 *(times are approximate depending on work completion)*
8:00 – 8:30 Light Breakfast and Check-in
8:30 – 11:30 Grade Group Breakouts, round 1

Reading Grade	*Room*
4, 5, 6	*Marion*
7, 8, 10	*Shelby*

11:30 – 12:30 Lunch
12:30 – Completion Complete rounds 2 and 3 of the Angoff Yes/No process
(Afternoon break will be determined by completion of round 2)

Iowa Assessments - Mathematics
Angoff Yes/No Standard Setting Meeting
Agenda

Monday, April 1, 2013
Hotel Check-in for those traveling long distances

Tuesday, April 2, 2013 *(times are approximate depending on work completion)*
8:00 – 8:30 Light Breakfast and Check-in
8:30 – 10:00 Training in Large Group Room Des Moines
10:15 – 12:00 Grade Group Breakouts, round 1

Mathematics Grade	*Room*
3, 4, 5	*Webster*
6, 7, 8	*Clayton*
10, 11	*Marion*

12:00 – 1:00 Lunch

1:00 – Completion Complete rounds 2 and 3 of the Angoff Yes/No process
(Afternoon break will be determined by completion of round 2)

Wednesday, April 3, 2013 *(times are approximate depending on work completion)*
8:00 – 8:30 Light Breakfast and Check-in
8:30 – 11:45 Grade Group Breakouts, round 1

Mathematics Grade	*Room*
3, 4, 5	*Webster*
6, 7, 8	*Clayton*
10, 11	*Marion*

11:45 – 12:45 Lunch

12:45 – Completion Complete rounds 2 and 3 of the Angoff Yes/No process
(Afternoon break will be determined by completion of round 2)

Thursday, April 3, 2013 *(times are approximate depending on work completion)*
8:00 – 8:30 Light Breakfast and Check-in
8:30 – 11:30 Grade Group Breakouts, round 1

Mathematics Grade	*Room*
3, 4, 5, 6	*Webster*
7, 8, 10, 11	*Clayton*

11:30 – 12:30 Lunch
12:30 – Completion Complete rounds 2 and 3 of the Angoff Yes/No process
(Afternoon break will be determined by completion of round 2)

Iowa Assessments - Science
Angoff Yes/No Standard Setting Meeting
Agenda

Tuesday, April 2, 2013
Hotel Check-in for those traveling long distances

Wednesday, April 3, 2013 *(times are approximate depending on work completion)*
8:00 – 8:30 Light Breakfast and Check-in
8:30 – 10:00 Training in Large Group Room Des Moines
10:15 – 12:00 Grade Group Breakouts, round 1

Science Grade	*Room*
5	*Benton*
8	*Dallas*
11	*Des Moines*

12:00 – 1:00 Lunch in Atrium

1:00 – Completion Complete rounds 2 and 3 of the Angoff Yes/No process
(Afternoon break will be determined by completion of round 2)

Appendix B: Participant Survey

IOWA ASSESSMENTS - READING
STANDARD SETTING MEETING
APRIL 2-4, 2013

PARTICIPANT SURVEY

THANK YOU FOR COMPLETING THIS SURVEY. WE ARE REQUIRED TO GATHER THIS INFORMATION TO DEMONSTRATE THE LEVEL OF EXPERTISE OF THE PARTICIPANTS IN OUR STANDARD SETTING EVENTS. PLEASE CIRCLE YOUR RESPONSES.

1. Grade Level Participation at Standard Setting:

Elementary Middle School High School

2. Gender:

Female Male

3. Ethnicity:

American Indian | Asian | Hawaiian/Pacific Islander | African American | Latino/ Hispanic | Multi-racial/ethnic | White/ non-Hispanic

4. Current Assignment:

Classroom Teacher | Educator (Non-Teacher) | Other

If "other" please provide additional information below (occupation, interest in education, etc.)

5. Work Setting:

Urban Suburban Rural

6. District Name:_____

7. How many years (total) have you been teaching?

8. Please list the grades and number of years teaching reading.

9. Please describe your professional development in the subject in the past two years. You may continue on the back if necessary.

Appendix C: Achievement Level Descriptors

Achievement Level Descriptors
Iowa CORE
Grade 3

Reading

Advanced (High)

The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the third grade level. The student at this level can understand a range of highly complex literary and informational texts, and the student can effectively use evidence from texts to show complex critical thinking. The student is able to show understanding of texts by using highly relevant and specific details from texts to support answers. The student can identify and thoroughly summarize central ideas by using many key details from texts. The student is able to thoroughly specify, interpret, and compare relationships within and across texts. Performance at this level suggests the ability to synthesize material from literary and informational texts.

Proficient (Intermediate)

The student demonstrates mastery and applies key concepts and skills that are fundamental at the third grade level. The student at this level can understand a range of increasingly complex literary and informational texts, and the student can use evidence from texts to show critical thinking. The student is able to show understanding of texts by using relevant and specific details from texts to support answers. The student can identify and adequately summarize central ideas by using key details from texts. The student is able to adequately specify, interpret, and compare relationships within and across texts. Performance at this level suggests the ability to summarize and analyze material from literary and informational texts.

Not Proficient (Low)

The student does not demonstrate or apply key concepts and skills that are fundamental at the third grade level. Additional learning opportunities are needed to achieve proficiency. The student at this level can understand a limited range of literary and informational texts at the lower range of complexity, and the student can use minimal evidence from texts to show thinking. The student is able to show understanding of texts by using basic details from texts to support answers. The student can identify and minimally summarize central ideas by using few key details from texts. The student is able to minimally specify, interpret, and compare relationships within and across texts. Performance at this level suggests the ability to show basic comprehension of material from literary and informational texts.

Achievement Level Descriptors

Iowa CORE
Grade 4

Reading

Advanced (High)

The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the fourth grade level. The student at this level can understand a range of highly complex literary and informational texts, and the student can effectively use evidence from texts to show complex critical thinking. The student is able to identify highly relevant and specific details in texts to support answers and high-level inferences. The student can identify and thoroughly summarize central ideas by using many key details from texts. The student is able to thoroughly interpret, compare, and connect information within and across texts. Performance at this level suggests the ability to synthesize material from literary and informational texts.

Proficient (Intermediate)

The student demonstrates mastery and applies key concepts and skills that are fundamental at the fourth grade level. The student at this level can understand a range of increasingly complex literary and informational texts, and the student can use evidence from texts to show critical thinking. The student is able to identify relevant and specific details in texts to support answers and inferences. The student can identify and adequately summarize central ideas by using key details from texts. The student is able to adequately interpret, compare, and connect information within and across texts. Performance at this level suggests the ability to summarize and analyze material from literary and informational texts.

Not Proficient (Low)

The student does not demonstrate or apply key concepts and skills that are fundamental at the fourth grade level. Additional learning opportunities are needed to achieve proficiency. The student at this level can understand a limited range of literary and informational texts at the lower range of complexity, and the student can use minimal evidence from texts to show thinking. The student is able to identify basic details in texts to support answers and low-level inferences. The student can identify and minimally summarize central ideas by using few key details from texts. The student is able to minimally interpret, compare, and connect information within and across texts. Performance at this level suggests the ability to show basic comprehension of material from literary and informational texts.

Achievement Level Descriptors

Iowa CORE
Grade 5

Reading

Advanced (High)

The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the fifth grade level. The student at this level can understand a range of highly complex literary and informational texts, and the student can effectively use evidence from texts to show complex critical thinking. The student is able to use highly relevant quotations from texts to support answers and high-level inferences. The student can determine and thoroughly summarize central ideas by using many key details from texts. The student is able to sufficiently analyze, compare, and integrate how information is presented within and across texts. Performance at this level suggests the ability to synthesize material from literary and informational texts.

Proficient (Intermediate)

The student demonstrates mastery and applies key concepts and skills that are fundamental at the fifth grade level. The student at this level can understand a range of increasingly complex literary and informational texts, and the student can use evidence from texts to show critical thinking. The student is able to use relevant quotations from texts to support answers and inferences. The student can determine and adequately summarize central ideas by using key details from texts. The student is able to adequately analyze, compare, and integrate how information is presented within and across texts. Performance at this level suggests the ability to summarize and analyze material from literary and informational texts.

Not Proficient (Low)

The student does not demonstrate or apply key concepts and skills that are fundamental at the fifth grade level. Additional learning opportunities are needed to achieve proficiency. The student at this level can understand a limited range of literary and informational texts at the lower range of complexity, and the student can use minimal evidence from texts to show thinking. The student is able to use basic quotations from texts to support answers and low-level inferences. The student can determine and minimally summarize central ideas by using few key details from texts. The student is able to minimally analyze, compare, and integrate how information is presented within and across texts. Performance at this level suggests the ability to show basic comprehension of material from literary and informational texts.

Achievement Level Descriptors

Iowa CORE
Grade 6

Reading

Advanced (High)

The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the sixth grade level. The student at this level can understand a range of highly complex literary and informational texts, and the student can effectively use evidence from texts to show complex critical thinking. The student is able to cite highly relevant, specific, and substantial evidence from texts to support analyses and high-level inferences. The student can thoroughly summarize central ideas and themes by using many significant key details from texts. The student is able to thoroughly analyze and compare how information is presented within and across texts. Performance at this level suggests the ability to synthesize material from literary and informational texts.

Proficient (Intermediate)

The student demonstrates mastery and applies key concepts and skills that are fundamental at the sixth grade level. The student at this level can understand a range of increasingly complex literary and informational texts, and the student can use evidence from texts to show critical thinking. The student is able to cite relevant, specific, and adequate evidence from texts to support analyses and inferences. The student can adequately summarize central ideas and themes by using significant key details from texts. The student is able to adequately analyze and compare how information is presented within and across texts. Performance at this level suggests the ability to summarize and analyze material from literary and informational texts.

Not Proficient (Low)

The student does not demonstrate or apply key concepts and skills that are fundamental at the sixth grade level. Additional learning opportunities are needed to achieve proficiency. The student at this level can understand a limited range of literary texts at the lower range of complexity, and the student can use minimal evidence from texts to show thinking. The student is able to cite basic and minimal evidence from texts to support analyses and low-level inferences. The student can minimally summarize central ideas and themes by using few key details from texts. The student is able to minimally analyze and compare how information is presented within and across texts. Performance at this level suggests the ability to show basic comprehension of material from literary and informational texts.

Achievement Level Descriptors
Iowa CORE
Grade 7

Reading

Advanced (High)

The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the seventh grade level. The student at this level can understand a range of highly complex literary and informational texts, and the student can effectively use evidence from texts to show complex critical thinking. The student is able to cite highly relevant and specific evidence from texts to support analyses and high-level inferences. The student can thoroughly summarize central ideas, and the student can substantially analyze the development of ideas throughout texts. The student is able to analyze relationships by thoroughly interpreting, comparing, and evaluating elements within and across texts. Performance at this level suggests the ability to synthesize material from literary and informational texts.

Proficient (Intermediate)

The student demonstrates mastery and applies key concepts and skills that are fundamental at the seventh grade level. The student at this level can understand a range of increasingly complex literary and informational texts, and the student can use evidence from texts to show critical thinking. The student is able to cite relevant and specific evidence from texts to support analyses and inferences. The student can adequately summarize central ideas, and the student can sufficiently analyze the development of ideas throughout texts. The student is able to analyze relationships by adequately interpreting, comparing, and evaluating elements within and across texts. Performance at this level suggests the ability to summarize and analyze material from literary and informational texts.

Not Proficient (Low)

The student does not demonstrate or apply key concepts and skills that are fundamental at the seventh grade level. Additional learning opportunities are needed to achieve proficiency. The student at this level can understand a limited range of literary and informational texts at the lower range of complexity, and the student can use minimal evidence from texts to show thinking. The student is able to cite basic and minimal evidence from texts to support analyses and low-level inferences. The student can minimally summarize central ideas, and the student can incompletely analyze the development of ideas throughout texts. The student is able to analyze relationships by minimally interpreting, comparing, and evaluating elements within and across texts. Performance at this level suggests the ability show basic comprehension of material from literary and informational texts.

Achievement Level Descriptors
Iowa CORE
Grade 8

Reading

Advanced (High)

The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the eighth grade level. The student at this level can understand a range of highly complex literary and informational texts, and the student can effectively use evidence from texts to show complex critical thinking. The student is able to cite highly relevant and specific evidence from texts to support complex inferences, analyses, and interpretations. The student can thoroughly summarize central ideas and analyze relationships among elements of texts. The student is able to thoroughly analyze, compare, and evaluate elements within and across texts. Performance at this level suggests the ability to synthesize material from literary and informational texts.

Proficient (Intermediate)

The student demonstrates mastery and applies key concepts and skills that are fundamental at the eighth grade level. The student at this level can understand a range of increasingly complex literary and informational texts, and the student can use evidence from texts to show critical thinking. The student is able to cite relevant and specific evidence from texts to support inferences, analyses, and interpretations. The student can adequately summarize central ideas and analyze relationships among elements of texts. The student is able to adequately analyze, compare, and evaluate elements within and across texts. Performance at this level suggests the ability to summarize and analyze material from literary and informational texts.

Not Proficient (Low)

The student does not demonstrate or apply key concepts and skills that are fundamental at the eighth grade level. Additional learning opportunities are needed to achieve proficiency. The student at this level can understand a limited range of literary and informational texts at the lower range of complexity, and the student can use minimal evidence from texts to show thinking. The student is able to cite minimal evidence from texts to support basic inferences, analyses, and interpretations. The student can minimally summarize central ideas and analyze relationships among elements of texts. The student is able to minimally analyze, compare, and evaluate elements within and across texts. Performance at this level suggests the ability to show basic comprehension of material from literary and informational texts.

Achievement Level Descriptors
Iowa CORE
Grade 10

Reading

Advanced (High)

The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the tenth grade level. The student at this level can understand a range of highly complex literary and informational texts, and the student can effectively use evidence from texts to show complex critical thinking. The student is able to cite relevant and substantial evidence from texts to justify analyses and complex inferences. The student can thoroughly summarize central ideas and provide insightful analyses of how ideas develop within texts. The student is able to thoroughly analyze and evaluate relationships among related texts. Performance at this level suggests the ability to synthesize information from literary and informational texts.

Proficient (Intermediate)

The student demonstrates mastery and applies key concepts and skills that are fundamental at the tenth grade level. The student at this level can understand a range of increasingly complex literary and informational texts, and the student can use evidence from texts to show critical thinking. The student is able to cite relevant and sufficient evidence from texts to adequately justify analyses and inferences. The student can adequately summarize central ideas and provide analyses of how ideas develop within texts. The student is able to adequately analyze and evaluate relationships among related texts. Performance at this level suggests the ability to summarize and analyze material from literary and informational texts.

Not Proficient (Low)

The student does not demonstrate or apply key concepts and skills that are fundamental at the tenth grade level. Additional learning opportunities are needed to achieve proficiency. The student at this level can understand a limited range of literary and informational texts at the lower range of complexity, and the student can use minimal evidence from texts to show thinking. The student is able to cite limited evidence from texts to justify analyses and basic inferences. The student can minimally summarize central ideas and provide analyses of how ideas develop within texts. The student is able to minimally analyze and evaluate relationships among related texts. Performance at this level suggests the ability to show basic comprehension of material from literary and informational texts.

Achievement Level Descriptors
Iowa CORE
Grade 11

Reading

Advanced (High)

The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the eleventh grade level. The student at this level can understand a range of highly complex literary and informational texts, and the student can effectively use evidence from texts to show complex critical thinking. The student is able to cite highly relevant and substantial evidence from texts to justify analyses and complex inferences. The student can thoroughly summarize multiple central ideas and analyze how ideas interact within texts. The student is able to thoroughly analyze, compare, and evaluate the interrelationships within and among multiple texts. Performance at this level suggests the ability to synthesize material from literary and informational texts.

Proficient (Intermediate)

The student demonstrates mastery and applies key concepts and skills that are fundamental at the eleventh grade level. The student at this level can understand a range of increasingly complex literary and informational texts, and the student can use evidence from texts to show critical thinking. The student is able to cite relevant and adequate evidence from texts to justify analyses and inferences. The student can sufficiently summarize multiple central ideas and analyze how ideas interact within texts. The student is able to adequately analyze, compare, and evaluate the interrelationships within and among multiple texts. Performance at this level suggests the ability to summarize and analyze material from literary and informational texts.

Not Proficient (Low)

The student does not demonstrate or apply key concepts and skills that are fundamental at the eleventh grade level. Additional learning opportunities are needed to achieve proficiency. The student at this level can understand a limited range of literary and informational texts at the lower range of complexity, and the student can use minimal evidence from texts to show thinking. The student is able to cite limited evidence from texts to justify analyses and complex inferences. The student can incompletely summarize multiple central ideas and analyze how ideas interact within texts. The student is able to minimally analyze, compare, and evaluate the interrelationships within and among multiple texts. Performance at this level suggests the ability show basic comprehension of material from literary and informational texts.

Achievement Level Descriptors
Iowa CORE
Mathematics
Grade 3

Mathematics

***Advanced (High)*: The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the third-grade level.**

Students at this level can solve one-step problems using multiplication and division with two-digit numbers and within 100. They can apply multiplication strategies and use relevant ideas or procedures of multiplication. They can explain arithmetic patterns. Students are able to fluently add and subtract within 1000 using multiple strategies. Students can represent the approximation of a fraction on a number line that has no partitioning. Students can solve one-step problems involving all time intervals. They are able to find the area of partitioned rectangular figures derived from word problems.

***Proficient (Intermediate)*: The student demonstrates mastery and applies key concepts and skills that are fundamental at the third-grade level.**

Students at this level are able to reason about and apply the appropriate operation necessary to solve one-step problems involving multiplication and division, and they can multiply within the 10-by-10 multiplication table, incorporating the commutative property of multiplication. They are able to multiply within 100 and solve two-step problems using addition and subtraction with numbers larger than 100 and solutions within 1000. Students can round whole numbers to the nearest 10 or 100 and fluently add within 1000 using strategies based on place value, properties of arithmetic, or the relationship between addition and subtraction. Students can identify and represent a fraction on a partitioned number line. They are able to use fractions to represent numbers equal to, less than, or greater than one. They are able to solve problems comparing fractions using visual fraction models and strategies based on numerators and denominators. Students are able to use standard metric units to estimate to a specified degree of precision and measure liquid volumes and masses of objects. They can tell and write time to the nearest minute. They can find the areas of figures made up of rectangles by multiplying side lengths and decomposing a figure into unit squares or nonoverlapping rectangles and adding them together. They are able to use rulers appropriately to measure in quarter-inch intervals and represent this data on a line plot. They can solve word problems involving perimeters of polygons. Students are able to partition shapes into parts with equal areas and draw examples of quadrilaterals of unspecified subcategories by reasoning about their attributes.

***Not Proficient (Low)*: The student does not demonstrate or apply key concepts and skills that are fundamental at the third-grade level. Additional learning opportunities are needed to achieve proficiency.**

Achievement Level Descriptors

Iowa CORE
Mathematics
Grade 4

Mathematics

***Advanced (High)*: The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the fourth-grade level.**

Students at this level can assess the reasonableness of solutions using mental computation and estimation strategies such as rounding. Students are able to compare fractions that have different numerators and denominators using comparison symbols (<, >, and =). They can compare decimals to the hundredths place on a number line or using <, >, and =, and they are able to justify the conclusions using visual models. Students are able to apply the perimeter and area formulas to rectangles in real-world problems. They can find an unknown angle on a diagram using addition or subtraction.

***Proficient (Intermediate)*: The student demonstrates mastery and applies key concepts and skills that are fundamental at the fourth-grade level.**

Students at this level can reason about the suitable methods to use in order to solve one-step problems using addition and subtraction, and they can solve one-step problems that involve equal groups or arrays using multiplication and division. They are able to find factor pairs for whole numbers in the range of 1–100. They can generate patterns and identify features of patterns. Students can read and write multi-digit whole numbers through 1,000,000 using numerals and number names and in expanded form by generalizing place value understanding. They are able to add and subtract two- and three-digit whole numbers. They can multiply four-digit whole numbers by a one-digit number. They can find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, and interpret the significance of any remainders in the context of word problems. Students can recognize and generate equivalent fractions using a variety of visual models. They are able to identify and generate equivalent forms of a fraction and represent the fraction in multiple ways. They can express equivalent fractions with denominators of 10 and 100, and they can add two fractions with denominators of 10 and 100. They are able to multiply a fraction by a whole number. Students are able to convert measurements within a system and represent measurement quantities using diagrams that feature measurement scales. They can create line plots and use line plots to interpret data recorded as fractions. They are able to use a protractor as a tool to measure and draw angles between 0 and 180 degrees. Students can distinguish between points, lines, line segments, and rays. They can draw and recognize lines of symmetry for two-dimensional figures.

***Not Proficient (Low)*: The student does not demonstrate or apply key concepts and skills that are fundamental at the fourth-grade level. Additional learning opportunities are needed to achieve proficiency.**

Achievement Level Descriptors
Iowa CORE
Mathematics
Grade 5

Mathematics

***Advanced (High)*: The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the fifth-grade level.**

Students at this level are able to compare two numerical patterns and explain the relationship between the corresponding terms in the patterns. Students can multiply by powers of 10 and can compare and round answers to indicate an answer with the necessary precision. Students are able to use, interpret, and create visual models for multiplying two fractions, both of which are greater than 1. Students can take the dimensions of a right rectangular prism, double one of those whole number dimensions, and determine that the volume of the new right rectangular prism is double that of the original. Students can graph coordinate points in fractional form on a coordinate grid with fractional axes increments of $\frac{1}{10}$.

***Proficient (Intermediate)*: The student demonstrates mastery and applies key concepts and skills that are fundamental at the fifth-grade level.**

Students at this level are able to write numerical expressions using parentheses, and be familiar with why and where the parentheses are inserted, and are able to calculate expressions containing two different operations. They can compare two numerical patterns listed in sequences or tables. Students can use whole number exponents to indicate powers of 10. They can round decimals to the thousandths place and read and write decimals to the thousandths place using numerals, number names, and expanded form. They can also compare these decimals using <, >, and =. They are able to fluently multiply multi-digit whole numbers and calculate whole number quotients of whole numbers with up to four-digit dividends and two-digit divisors. They can perform the four operations on decimals to the hundredths place. Students are able to add and subtract fractions and mixed numbers with unlike denominators. They are able to estimate and assess the reasonableness of answers when using fractions. They can multiply mixed numbers. They can use visual models when multiplying two fractions, one of which is greater than 1. They can divide a whole number by a unit fraction and interpret the solution. Students are able to calculate the volume of a right rectangular prism using the formulas $V = lwh$ and $V = Bh$. They can interpret and convert units of measurement from smaller to larger and larger to smaller. They are able to display data sets made up of fractions of a unit on a line plot. They can solve one-step problems using information from line plots that require addition, subtraction, and multiplication of fractions. Students are able to use a coordinate grid to graph coordinate points in whole number form and in fractional form when the fractions have a denominator of 2 or 4. They can classify two-dimensional figures based on properties such as number of sides.

***Not Proficient (Low)*: The student does not demonstrate or apply key concepts and skills that are fundamental at the fifth-grade level. Additional learning opportunities are needed to achieve proficiency.**

Achievement Level Descriptors
Iowa CORE
Mathematics
Grade 6

Mathematics

***Advanced (High)*: The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the sixth-grade level.**

Students at this level are able to solve multistep problems by finding the whole when given a part and its percentage of the whole. They can explain ratio relationships between any two numbers and can identify relationships between numerical models or representations. Students can use visual fraction models to divide fractions by other fractions in real-world problems. They are able to grasp that a fraction multiplied or divided by a fractional equivalent of 1 is equal to the original fraction. Students can use properties of operations to show why two expressions are equivalent. They can write and evaluate numerical expressions with nonnegative integer exponents. They can solve one-variable addition or multiplication equations and inequalities using rational numbers. Students can calculate surface area of triangular or rectangular prisms and of triangular or rectangular pyramids. Students are able to predict the effect on the mean and median, given a change in a data set. They can complete a data set, given measures of mean, median, mode, or interquartile range.

***Proficient (Intermediate)*: The student demonstrates mastery and applies key concepts and skills that are fundamental at the sixth-grade level.**

Students at this level are able to solve unit rate problems. They can solve percentage problems by finding the whole when given a part and its percentage of the whole. They are able to describe a ratio relationship between two numbers and to understand the concept of unit rate in problems using fractions with denominators equal to or less than 12. Students can divide a mixed number by a fraction and connect it to a visual model. They are able to multiply and divide multi-digit decimals. They can find the greatest common factor of two numbers equal to or less than 100 and the least common multiple of two numbers equal to or less than 12. They are able to plot coordinate points with rational numbers on a coordinate grid (quadrant I). They understand absolute value and ordering rational numbers. Students can write and evaluate numerical expressions without exponents. They can identify equivalent expressions. They are able to write one-variable addition or multiplication equations and inequalities using nonnegative rational numbers. They can graph solutions to equations and inequalities on a number line. They are able to translate between equivalent graphs, tables, and equations of linear relationships. Students are able to calculate areas of quadrilaterals and other polygons that can be decomposed into quadrilaterals and triangles. They can calculate the volume of a right rectangular prism with side-length measurements in mixed number or fractional form. Students are able to identify a center and spread for a data set and are able to relate it to the overall shape of the data distribution. They grasp that the measure of center summarizes all of a data set's values with a single number. They are able to summarize or display data in box plots and to find the mean, median, and interquartile range. They are able to use range and measures of center to explain the shape of a data set's distribution and are able to answer statistical questions about how the data set relates to a given context.

***Not Proficient (Low)*: The student does not demonstrate or apply key concepts and skills that are fundamental at the sixth-grade level. Additional learning opportunities are needed to achieve proficiency.**

Achievement Level Descriptors

Iowa CORE
Mathematics
Grade 7

Mathematics

***Advanced (High)*: The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the seventh-grade level.**

Students at this level are able to solve real-world problems involving proportional relationships that require measurement conversions. Students can use addition, subtraction, multiplication, and division to solve real-world problems involving integers and positive fractions. Students are able to construct inequalities with two variables to solve problems. Students can describe two-dimensional figures that are formed by slicing a sphere, cone, cylinder, or three-dimensional figure with rectangular or triangular faces. They are able to use properties of supplementary, complementary, vertical, and adjacent angles to solve multistep problems. Students are able to generate and simulate multiple data samples of the same count to gauge variations in estimates and predictions. They can appropriately select the measures of variability that are best used when drawing informal comparisons between two populations. They are able to construct a simulated experiment and record frequencies for compound events.

***Proficient (Intermediate)*: The student demonstrates mastery and applies key concepts and skills that are fundamental at the seventh-grade level.**

Students at this level are able to represent and analyze proportional relationships from various models such as graphs, equations, and tables, and they are able to solve one-step rate problems. Students can solve problems using addition, subtraction, and multiplication with rational numbers. They can comprehend why $(-1)(-1) = 1$. They are able to convert to decimals from common fractions and from fractions with denominators that are a factor of a power of 10. Students are able to add, subtract, and factor linear expressions with decimal coefficients. They can graph the solution set of inequalities with one variable and rational numbers and summarize the outcomes in the context of the problem. They can construct algebraic expressions taken from real-world or mathematical situations. Students are able to create a scale drawing of a figure given a scale factor. They can appropriately represent and discriminate between the radius, diameter, area and circumference of a circle. They are able to calculate the volume of any right rectangular prism and the surface area of three-dimensional objects with rectangular and triangular faces. They can use vertical angles designated by a variable to solve two-step problems. Students can use appropriate sampling methods to draw inferences regarding a population in a given context. They can visually compare and informally assess the degree of overlap of two numerical data distributions. They are able to calculate theoretical probabilities of compound events.

***Not Proficient (Low)*: The student does not demonstrate or apply key concepts and skills that are fundamental at the seventh-grade level. Additional learning opportunities are needed to achieve proficiency.**

Achievement Level Descriptors
Iowa CORE
Mathematics
Grade 8

Mathematics

***Advanced (High)*: The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the eighth-grade level.**

Students at this level are able to approximate irrational numbers between two integers to a specified level of precision. Students can write a system of two linear equations with two variables to represent a context. Students are able to interpret the rate of change (i.e., slope) of a linear function based on its graph. They can compare properties of two nonlinear functions represented in different ways. Students can describe the result of two unique transformations, including dilations, on a figure. They can use the Pythagorean theorem to draw and identify right triangles in three-dimensional figures. They are able to solve problems involving the volumes of cones, cylinders, and spheres. Students can use trend lines or lines of best fit to make predictions in real-world contexts.

***Proficient (Intermediate)*: The student demonstrates mastery and applies key concepts and skills that are fundamental at the eighth-grade level.**

Students at this level are able to convert fractions to repeating decimals. They can use rational approximations of familiar irrational numbers to make numerical comparisons. Students can solve simple quadratic monomial equations and represent the solution as a square root. They can perform operations using scientific notation to represent large and small numbers. They are able to identify the rate of change (i.e., slope) in linear relationships. They can solve linear equations with rational number coefficients. They are able to use algebraic strategies to solve systems of linear equations with integer coefficients. Students can classify a function as linear or nonlinear based on its graph. They comprehend that linear equations of the form $y = mx + b$ are functions. They make meaningful comparisons of two linear functions represented algebraically, graphically, or in a table. Students are able to determine the location of a point on a coordinate grid after a transformation is performed on the point. They can grasp the fact that a series of translations, rotations, and reflections on a figure will result in a congruent figure. They are able to identify a series of rotations, reflections, translations, and dilations of two similar figures in the coordinate plane. They can find the distance between two points in the coordinate plane, and they can apply the Pythagorean theorem to find the side lengths of right triangles. They are able to calculate the volumes of cones, cylinders, and spheres. Students can identify, describe, and interpret outliers for a given scatter plot. They are able to write a linear equation for a trend line or line of best fit using models.

***Not Proficient (Low)*: The student does not demonstrate or apply key concepts and skills that are fundamental at the eighth-grade level. Additional learning opportunities are needed to achieve proficiency.**

Achievement Level Descriptors
Iowa CORE
Mathematics
Grade 10

Mathematics

***Advanced (High)*: The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the tenth-grade level.**

Students at this level are able to explain how rational exponents extend from the properties of integer exponents. They can use units to define appropriate quantities and measurements in unfamiliar contexts and construct models. Students can solve a formula for any variable in a formula determined by a linear or rational equation. They are able to provide examples of extraneous solutions when solving equations. Students are able to find the input for any given output from a function given appropriate restrictions on the domain. They can verbally describe the relationship created by a function as it pertains to a given context. Students can identify a sequence of transformations when given a figure's initial and final positions on a coordinate grid. They are able to explain how the criteria for triangle congruence, using ASA, SAS, and SSS rules, follow from the definition of congruence in terms of rigid motions. They can construct equilateral triangles, squares, and regular hexagons inscribed inside circles, and triangles circumscribed about circles. They are able to use the slope of a given line to find the equations of parallel and perpendicular lines passing through a given point. Students can derive the equations of circles and parabolas given the necessary attributes of each. They are able to use coordinates to calculate perimeters and areas of polygons using the distance formula. Students can summarize categorical data for two categories in frequency tables.

***Proficient (Intermediate)*: The student demonstrates mastery and applies key concepts and skills that are fundamental at the tenth-grade level.**

Students at this level are able to apply laws of exponents on expressions and switch between writing expressions with rational exponents and in radical form. They can use repeated reasoning to know that the sums and products of rational numbers are rational, and sums and products involving nonzero rational numbers with irrational numbers are irrational. They are able to choose and interpret the appropriate units to solve multi-step problems. They can select and interpret the origin and scale of graphs and data displays. Students can interpret parts of expressions and separate complicated expressions into parts in order to rewrite equivalent forms, explain its properties, and solve equations. They are able to identify the binomial factors of quadratic expressions to identify the zeros, and relate them to the roots of the corresponding quadratic equation. They can add, subtract, and multiply multi-variable polynomials. They are able to construct graphs of equations and inequalities of polynomial and exponential functions and estimate solutions of systems of equations from a graph. They can rearrange formulas to single out and solve a specific unknown term. They are able to give practical arguments to defend various methods of solving equations. Students can identify the domain and range for any given function presented in a graph, equation, sequence, or description and know that for each element of a function's domain there is exactly one corresponding output in the range. They are able to model a function in a graph or table and interpret key features such as intercepts, rate of change, or symmetries. They can determine the average rate of change of a function over a specified interval. Students are able to fluently apply transformations to geometric shapes and their components both manually and using technology, and understand the results in terms of congruency and similarity. They can write proofs in regard to lines, angles, and geometric shapes. They are able to utilize appropriate mathematical tools and methods such as a compass, straightedge, technology, and paper folding to create two-dimensional figures. They can identify and describe relationships regarding inscribed and

circumscribed angles, radii, chords, and arcs of circles. Students can use statistics to compare measures of center and spread for multiple data sets, and recognize potential correlations and tendencies from given data.

***Not Proficient (Low)*: The student does not demonstrate or apply key concepts and skills that are fundamental at the tenth-grade level. Additional learning opportunities are needed to achieve proficiency.**

Achievement Level Descriptors
Iowa CORE
Mathematics
Grade 11

Mathematics

***Advanced (High)*: The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the eleventh-grade level.**

Students at this level are able to use the relation $i^2 = -1$ with the associative, commutative, and distributive properties to add, subtract, and multiply complex numbers. Students are able to explain why the x-coordinates of the points where two graphs, $f(x)$ and $g(x)$, intersect are the solutions to $f(x) = g(x)$. They can find solutions or approximate solutions to $f(x) = g(x)$ using graphing technology and tables of values, including scenarios where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, and exponential. Students are able to write a function defined by an expression in different yet equivalent forms, revealing properties of the function such as finding zeros, extreme values, and symmetry, and interpreting these in the context of the problem. They can determine the effects of transformations on the graph of a given function $f(x)$. They are able to find inverse functions. They can select appropriate trigonometric functions to model periodic trends with specified amplitude and frequency. Students can use trigonometric ratios and the Pythagorean theorem to solve right triangles in applied problems. Students can differentiate between correlation and causation of statistical data. They can determine if a given model is consistent with findings of a simulation, and recognize the intentions of and variations among sample surveys, experiments, and observational studies. They can apply the probability rule of $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ and interpret the answer in the given context.

***Proficient (Intermediate)*: The student demonstrates mastery and applies key concepts and skills that are fundamental at the eleventh-grade level.**

Students at this level understand the nature of an imaginary number, i, such that $i^2 = -1$, and the role of complex numbers of the form $ax + bi$. They can solve quadratic equations with rational coefficients that result in complex solutions. Students can solve systems made up of one linear equation and one quadratic equation in two variables both algebraically and graphically. Students can graph functions showing key features by hand for simple functions and with technology for more complex functions, including intercepts, asymptotes, and piecewise functions. They can compare properties of functions, such as finding which has the greatest maximum, with functions represented algebraically, graphically, in tables, or by descriptions. They are able to differentiate between scenarios that can be modeled with linear functions and with exponential functions, and construct linear and exponential functions arithmetically, graphically, or given a description. They can interpret the parameters of linear and exponential functions in a given context. Students can use ratios of the sides of right triangles to define trigonometric ratios for the triangle's acute angles. They can explain and use the correlation between sine and cosine of complementary angles. They are able to identify shapes of two-dimensional cross-sections of three-dimensional objects and classify objects created by rotations of two-dimensional figures. Students interpret shape, center, and spread for given contexts of data sets and recognize the effects of outliers. They can use the mean and standard deviation of a data set to fit it to a normal distribution and estimate population percentages with the use of calculators, spreadsheets, and tables to approximate the areas under normal curves. They are able to represent data for two variables on a scatter plot and describe their relationship. They can understand and apply independent and conditional probability models to interpret data. They are able to find the conditional probability of A given B and interpret the answer in the given context.

***Not Proficient (Low)*: The student does not demonstrate or apply key concepts and skills that are fundamental at the eleventh-grade level. Additional learning opportunities are needed to achieve proficiency.**

Achievement Level Descriptors
Iowa CORE
Science
Grade 5

Grade 5 *Advanced (High)*: The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the fifth-grade level.

Students at this level generate questions that can be answered through simple scientific investigations, and they understand the concept of a fair test. Students describe objects, events, and organisms and organize them based on the types of questions they want to answer. They plan and conduct scientific investigations by evaluating and applying the proper use of technology, procedures, and mathematics to collect, display, and interpret data. Students analyze the merits or strengths of the observations and data used to formulate explanations. Students evaluate simple scientific explanations, models, and technological designs and identify possible alternative scientific explanations and models.

Students apply knowledge of properties and uses of earth materials as well as knowledge of processes and changes on or in Earth's land, oceans, and atmosphere. They apply knowledge of fossils to make conclusions and inferences about past life on Earth. They recognize that movements and interactions of air masses are used to forecast the weather. Students recognize the properties of objects in the solar system and use predictable patterns to describe the motion, movement, and location of specific objects within our solar system. Students identify, describe, and arrange substances based on their characteristic properties. Students describe states of matter, predict changes in states of matter, and apply the concept of conservation of mass/matter. Students apply knowledge of sound, light, electricity, magnetism, and heat when given specific examples. Students describe how forces are related to an object's motion, and they can analyze a graph representing an object's motion. Students describe how structures, characteristics, and adaptations of organisms allow them to function and survive within their habitats. They explain how individual organisms are influenced by internal and external factors. Students analyze relationships between living and nonliving factors in terrestrial and aquatic ecosystems. They describe and analyze examples of environmental stewardship and describe interactions and interdependencies between humans and the environment. Students describe basic human body systems and explain how the systems work together. They recognize the value of personal health and analyze various wellness issues.

Grade 5 *Proficient (Intermediate)*: The student demonstrates mastery and applies key concepts and skills that are fundamental at the fifth-grade level.

Students at this level identify questions that can be answered through simple scientific investigations, and they recognize the need for different types of investigations. They plan and conduct scientific investigations in a safe manner by using appropriate technology, techniques, and basic mathematics to gather, organize, and analyze data. Students make and revise evidence-based scientific explanations and models. They formulate and revise simple scientific explanations, models, and technological designs.

Students identify properties of earth materials and physical changes on or in Earth's land, oceans, and atmosphere. They apply knowledge of fossils to make conclusions about past life on Earth. They apply knowledge of weather and weather patterns to everyday situations. Students recognize the properties, movements, and locations of objects in our solar system. Students identify and describe substances based on their characteristic properties. They recognize states of matter, changes in states of matter, and the concept of conservation of mass/matter. They recognize characteristics of sound, light, electricity, magnetism, and heat. Students identify forces related to an object's motion. Students recognize structures, characteristics, and adaptations of organisms that allow the organisms to function and survive within their habitats. They can identify internal and external factors that affect individual organisms. Students identify relationships between living and nonliving factors in terrestrial and aquatic ecosystems. They identify examples of environmental stewardship and recognize interactions and interdependencies between humans and the environment. They

recognize and describe basic human body systems. Students apply knowledge of personal health and common wellness issues.

Grade 5 *Not Proficient (Low)*: The student does not demonstrate or apply key concepts and skills that are fundamental at the fifth-grade level. Additional learning opportunities are needed to achieve proficiency.

Achievement Level Descriptors
Iowa CORE
Science
Grade 8

Grade 8 *Advanced (High)*: The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the eighth-grade level.

Students at this level generate and analyze questions that can be answered through scientific investigations, and they describe the concept of a fair test. They design and conduct a variety of scientific investigations depending on the testable questions. Students select and use appropriate technology and techniques to collect, display, analyze, and interpret multiple sets of data. They incorporate mathematics during the inquiry process to generate descriptions, explanations, predictions, and models for natural phenomena. They apply critical thinking skills and use scientific logic to generate valid connections between scientific evidence and conclusions. Students explain, evaluate, and defend procedures and conclusions for an investigation. Students describe appropriate safety procedures in a laboratory or field setting. Students generate and analyze scientific explanations, models, and technological designs, and they evaluate alternative explanations and predictions.

Students explain and analyze structures and processes of the earth system. They explain constructive and destructive forces that change Earth and its surface. Students analyze the interconnected processes within the water cycle and the rock cycle. Students describe how today's scientific evidence can be linked to Earth's history. Students use Earth's atmospheric properties to explain how they influence weather and climate. Students describe the components of our solar system, and they analyze the effects of gravity on objects within our solar system. Students describe elements, compounds, mixtures, and solutions based on the nature of their physical and chemical properties. Students compare physical and chemical changes and explain their relationship to the conservation of matter and energy. They describe forms of energy and analyze examples of energy transfer. Students analyze motions and forces. Students describe the basic components and functions of cells, tissues, organs, and organ systems. They analyze how different organisms pass on traits (heredity). Students evaluate the complementary nature of structure and function and the commonalities among organisms. Students analyze the interdependency of organisms, changes in environmental conditions, and survival of individuals and species. They describe example of the cycling of matter and the flow of energy in ecosystems. Students describe social and personal implications of environmental issues. Students analyze interconnections between human body systems including the breakdown in structure or function that disease causes.

Grade 8 *Proficient (Intermediate)*: The student demonstrates mastery and applies key concepts and skills that are fundamental at the eighth-grade level.

Students at this level identify and generate questions that can be answered through scientific investigations, and they apply the concept of a fair test. They design and conduct a specific kind of scientific investigation based on a testable question. Students select and use appropriate technology and techniques to collect, display, analyze, and interpret data. They apply a blend of mathematics and science knowledge and skills to generate descriptions, explanations, predictions, and models for natural phenomena. They apply scientific logic to generate valid connections between scientific evidence and explanations. Students describe and defend procedures and explanations. Students recognize appropriate safety procedures in a laboratory or field setting. Students generate and describe scientific explanations, models, and technological designs, and they describe alternative explanations and predictions.

Students recognize and describe the structure and processes of the earth system. They identify and describe constructive and destructive forces that change Earth and its surface. Students identify and describe the components of the water cycle and the rock cycle. Students recognize how today's scientific evidence can be linked to Earth's history. Students identify Earth's atmospheric properties and how they influence weather and

climate. Students identify the components of our solar system, and they recognize and describe the effects of gravity on objects within our solar system. Students identify elements, compounds, mixtures, and solutions based on the nature of their physical and chemical properties. Students recognize physical and chemical changes and describe their relationship to the conservation of matter and energy. They identify forms of energy and describe examples of energy transfer. Students identify and describe motions and forces. Students identify the basic components and functions of cells, tissues, organs, and organ systems. They recognize and describe how different organisms pass on traits (heredity). Students describe the complementary nature of structure and function and the commonalities among organisms. Students recognize and describe the interdependency of organisms, changes in environmental conditions, and survival of individuals and species. They apply knowledge of the cycling of matter and the flow of energy in ecosystems. Students recognize social and personal implications of environmental issues. Students identify interconnections between human body systems including the breakdown in structure or function that disease causes.

***Not Proficient (Low)*: The student does not demonstrate or apply key concepts and skills that are fundamental at the eighth-grade level. Additional learning opportunities are needed to achieve proficiency.**

Achievement Level Descriptors
Iowa CORE
Science
Grade 11

Grade 11 *Advanced (High)*: The student demonstrates and applies key concepts and skills that exceed those that are fundamental at the eleventh-grade level.

Students at this level generate and evaluate testable hypotheses that can guide scientific investigations, and they explain why an investigation is fair and valid. They design and conduct a variety of scientific investigations depending on the testable questions. Students select and use appropriate technology and techniques to collect, display, analyze, and interpret data from multiple sources. They incorporate mathematics throughout the inquiry process to generate descriptions, explanations, predictions, and models for natural phenomena. They apply critical thinking skills and use scientific logic to evaluate valid connections between scientific evidence and conclusions. Students explain, evaluate, and defend procedures and conclusions for an investigation, and they describe possible sources of error. Students evaluate appropriate safety procedures in a laboratory and field setting. Students generate and analyze scientific explanations, models, and technological designs, and they describe the value of alternative explanations and predictions.

Students describe internal and external energy sources for the earth system. They describe how each element on Earth moves among reservoirs in the solid Earth, oceans, atmosphere, and organisms as part of geochemical cycles. Students describe the scientific origin of the earth system and the universe, and they describe processes related to star formation. Students describe the parts of atoms. They analyze the structure and properties of matter. Students identify reaction rates and equilibrium of chemical reactions. They analyze motions and forces using Newton's laws of motion. They explain the concept of conservation of energy and increase in disorder. Students analyze interactions of energy and matter related to wave phenomena. Students describe basic processes associated with cell membranes and other cellular structures. They explain that most cell functions involve chemical reactions. Students describe main structures and basic functions of cell respiration and photosynthesis. They analyze how factors influence enzyme activity in a catalyzed food reaction. They evaluate the structural and chemical properties of DNA. Students explain the relationships between DNA, chromosomes, and sexual reproduction and their outcomes. Students analyze basic patterns of inheritance and sources of genetic variability. They explain processes associated with natural selection, species evolution, and past and present evolutionary relationships. They analyze how carbon, nitrogen, and oxygen cycle in ecosystems. Students describe energy transformations between organisms. Students analyze the interdependence of organisms and predict how human actions can affect ecological stability. They explain limiting factors that affect populations. Students describe the structure and function of nerve cells and explain how neurotransmitters and sensor organs affect behavior. Students analyze the basic functions of the human immune system, hormonal system, and coordinated systems (nervous, muscular, and bone).

Grade 11 *Proficient (Intermediate)*: The student demonstrates mastery and applies key concepts and skills that are fundamental at the eleventh-grade level.

Students at this level generate testable hypotheses that can guide scientific investigations, and they recognize a fair and valid investigation. They design and conduct a variety of scientific investigations depending on the testable questions. Students select and use appropriate technology and techniques to collect, display, analyze, and interpret data from a single source or multiple sources. They incorporate mathematics throughout the inquiry process to generate descriptions, explanations, predictions, and models for natural phenomena. They apply critical thinking skills and use scientific logic to explain valid connections between scientific evidence and conclusions. Students explain, evaluate, and defend procedures and conclusions for an investigation, and they identify possible sources of error. Students describe appropriate safety procedures in a laboratory and field

setting. Students generate and analyze scientific explanations, models, and technological designs, and they recognize the value of alternative explanations and predictions.

Students identify internal and external energy sources for the earth system. They recognize that each element on Earth moves among reservoirs in the solid Earth, oceans, atmosphere, and organisms as part of geochemical cycles. Students describe the scientific origin of the earth system and the universe, and they identify processes related to star formation. Students identify the parts of atoms. They recognize and describe the structure and properties of matter. Students identify reaction rates and equilibrium of chemical reactions. They explain motions and forces using Newton's laws of motion. They recognize the concept of conservation of energy and increase in disorder. Students identify and describe interactions of energy and matter related to wave phenomena. Students identify basic processes associated with cell membranes and other cellular structures. They recognize that most cell functions involve chemical reactions. Students identify main structures and basic functions of cell respiration and photosynthesis. They describe how factors influence enzyme activity in a catalyzed food reaction. They explain the structural and chemical properties of DNA. Students recognize the relationships between DNA, chromosomes, and sexual reproduction and their outcomes. Students identify basic patterns of inheritance and sources of genetic variability. They identify and describe processes associated with natural selection, species evolution, and past and present evolutionary relationships. They describe how carbon, nitrogen, and oxygen cycle in ecosystems. Students identify energy transformations between organisms. Students recognize and describe the interdependence of organisms and explain how human actions can affect ecological stability. They identify limiting factors that affect populations. Students identify the structure and function of nerve cells and describe how neurotransmitters and sensor organs affect behavior. Students describe the basic functions of the human immune system, hormonal system, and coordinated systems (nervous, muscular, and bone).

Grade 11 *Not Proficient (Low)*: The student does not demonstrate or apply key concepts and skills that are fundamental at the eleventh-grade level. Additional learning opportunities are needed to achieve proficiency.

Appendix D: Training Presentation

Setting Academic Proficiency Standards for the Iowa Assessments

April 2 – 4, 2013

1

Welcome and Introductions

- Dianne Chadwick, Iowa Department of Education
- Jay Pennington, Iowa Department of Education
- Content Specialists
  - Deb Hindman – Reading
  - Judith Spitzli – Mathematics
  - Yvette McCulley - Science

2

Introduction of DRC Staff

- David Chayer, Trainer and Lead Facilitator
- Julie Korts, Project Manager
- John Born, Project Manager

3

Introduction of DRC Staff

Reading

- Marc Julian, Group Facilitator
- Christie Plackner, Group Facilitator
- Katie Andersen, Group Facilitator

Mathematics

- Richard Smith, Group Facilitator
- Vince Primoli, Group Facilitator
- Matt Stearns, Group Facilitator

4

Introduction of DRC Staff

Science

- Mayuko Simon, Group Facilitator
- Lucy Liu, Group Facilitator
- Ann Hu, Group Facilitator

Data Analysis

- Djibril Liassou
- Dan Olson

5

Introduction of DRC Staff

Content Specialists

- Dave Durette, Science
- Cheryl Engle, Reading
- John Selisky, Mathematics

6

Logistics: Date, Panelists, Method

- Date
  - April 2 - 4, 2013
- Panelists
  - Three subjects: Reading, Mathematics, and Science
  - Approximately 9 - 15 per grade level
  - Grades 3, 4, 5, 6, 7, 8, 10, and 11 for Mathematics and Reading
  - Grades 5, 8, and 11 for Science
- Method
  - Modified Angoff Procedure

7

Forms and Documentation

- Personal Information Form
- Reimbursement Form
- Confidentiality Agreement
- Participant Survey
- Readiness Survey
- Evaluation Form at the end of the standard setting

8

Security Reminders

A Note about Confidentiality

- While in the standard setting room, do not use computers, cameras, phones, or anything to record either an image of the test or items or record notes about the test or items
- All materials are secure and are not to be shared
- These materials are not to be copied, memorized, emailed, texted, or in any way transmitted

9

Security Reminders (cont.)

A Note about Confidentiality

- All discussions and recommendations are confidential
- The results are confidential
- No materials are to leave the room
- You may describe the process used to recommend the cut scores, but not the items or the results

10

Purpose of the Meeting

- To recommend cut scores for the Iowa Assessments that categorize students into one of three achievement levels:
  - Advanced
  - Proficient
  - Not Proficient
- To articulate these expectations across all applicable grades

11

Schedule

- Tuesday Break-Out Groups:
  - Grade 4 Reading and Mathematics
  - Grade 7 Reading and Mathematics
  - Grade 10 Reading and Mathematics

12

Schedule
(cont.)

- Wednesday Break-Out Groups:
  - Grade 3 Reading and Mathematics
  - Grade 6 Reading and Mathematics
  - Grade 11 Reading and Mathematics
  - Grade 5 Science
  - Grade 8 Science
  - Grade 11 Science

13

Schedule
(cont.)

- Thursday Break-Out Groups:
  - Grade 5 Reading and Mathematics
  - Grade 8 Reading and Mathematics

14

Methodology

Modified Angoff Procedure

- One of a broad category of methods that focuses on item performance rather than examinee performance
- Places emphasis on what a student **should** know and be able to do, as defined by the achievement level descriptors (ALDs)

15

Step 1: How do students demonstrate their proficiency?

- Take the test
  - Provides panelists with a feel for students' testing experience on the operational administration of the Iowa Assessments

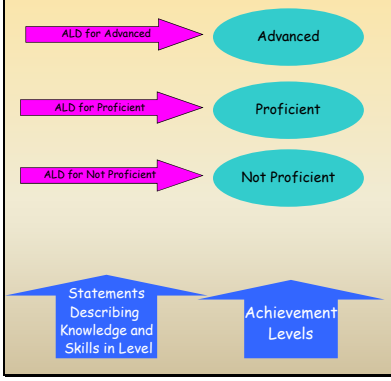
16

Step 2: What do the achievement levels mean?

- Achievement Level Descriptors (ALDs) are:
  - Statements that describe the knowledge and skills expected at each of the three achievement levels
  - Unique to each grade and subject
  - The ALDs describe the **middle** of the level, not the boundary between levels

17

The Relationships Between ALDs and Achievement Levels



18

Please remember:

- The ALDs are based on the Iowa Common Core Standards for Reading and Mathematics
- The Science ALDS are based on the Iowa Next Generation Science standards that were just released
- Instruction in the 2011-2012 school year was not based on these standards

19

Please remember:

Spot for IDE to describe standards and ALDs

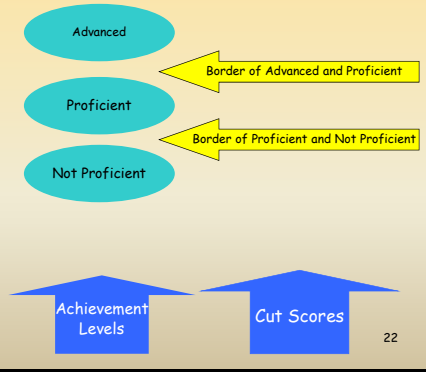
20

Step 3: What Defines Borderline Students?

- Based on the newly-created ALDs, visualize Iowa students who, are:
  - Just barely leaving one level, and
  - Just barely entering the next higher level
  - Assume that all students received instruction based on the new standards

21

The Relationships Between Achievement Levels and Cut Scores



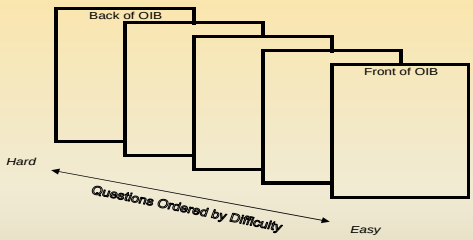
22

Step 4: How will the items be presented?

- Panelists will use an Ordered Item Booklet (OIB)where the operational items are ordered from easiest to most difficult based on *p*-value (the proportion of students in Spring 2012 who answered the item correctly)

23

Ordered Item Booklet (OIB)



•Based on Spring 2012 data

24

Step 5: What decisions do we make?

- On an item by item basis, panelists are asked to make judgments about whether students at the borderline between adjacent achievement levels would be able to answer the items correctly or incorrectly
- There may be a range of inconsistent judgments

25

Step 5: What decisions do we make? (cont.)

- Please remember that the OIB is based on Spring 2012 results and that instruction may not have covered all of the standards in the appropriate grade levels. Consequently, the ordering of the items from easiest to hardest may not match your evaluation of the difficulty of the item for the students receiving instruction based on the new standards.

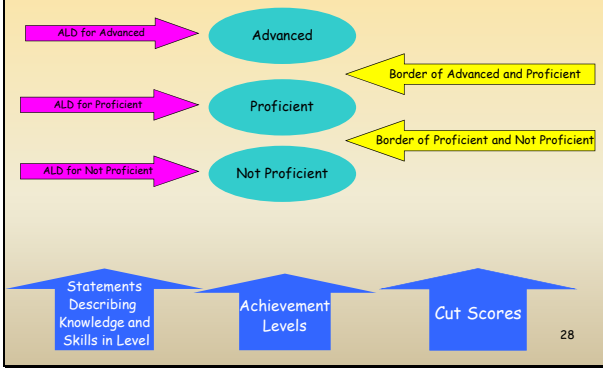
26

What happens to our decisions?

- Your collective judgments determine the recommended cut scores that separate:
  - ***Proficient*** students from ***Not Proficient*** students
  - ***Advanced*** students from ***Proficient*** students

27

The Relationships Among ALDs, Achievement Levels, and Cut Scores



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Overview of Process

- Three rounds of individual judgments
  - Group discussions
  - Opportunities to revise judgments
  - Impact data will be presented at the beginning of Round 3
    - For example:
      - What were the cut scores resulting from other panelists' item-level decisions, or
      - The percent of spring 2012 students that would fall into each of the three achievement levels based on the group recommendations from the previous round

29

Articulation Across Grades: The Process

- Results from Rounds 1, 2, and 3 will be presented to the panelists for relevant grades as they become available
- If necessary, a final vertical articulation presentation will be scheduled

30

Panelists' Roles and Responsibilities

- Satisfy yourself that you have contributed to a group recommendation that is based on your experience and professional judgment

31

Outcomes

- The recommendations from this meeting will be presented to the State Board of Education for review, along with other relevant information
- Final cut scores will be established and approved by the State Board
- Board-approved cut scores may not be the same as the group recommendations from this meeting

32

Test Security

- Check in
  - Distribution of training materials
- Security
  - ALL materials must remain in the room
  - For unscheduled breaks, please notify the Room Facilitator
  - No discussions related to any of the secure materials outside of the rooms, including breaks, lunch, dinner or before or after the meeting in any location
- Check out
  - Turn in materials at the end of each session
  - Materials will be returned to you at the beginning of each session

33

Return Times

- Room Facilitator will indicate when you should return (e.g., after breaks and lunch)
- Times may be different for each room
- Please be prompt

34

Training Materials

- Sample:
  - NAEP ALDs (grade 8 math)
  - Five NAEP items (grade 8 math) in OIB
  - Item Information Sheet
  - Item Separation Chart
  - Participant Classification Form

35

Achievement Level Descriptors

- Achievement Level Descriptors (ALDs) describe the level of knowledge and skills required at each achievement level
  - Not Proficient
  - Proficient
  - Advanced

36

Achievement Level Descriptors

- Policy definitions provide descriptors for each level of proficiency
- Policy definitions with full descriptors communicate content expectations at each grade level assessed (e.g., number sense, geometric concepts, algebraic concepts, data analysis/probability concepts)

37

Angoff Training

This method of standard setting was developed by William Angoff in 1971. The method focuses on the performance of hypothetical students defined by the ALDs on the items that appear on the test.

In this version of the Angoff method, the items are ordered from easiest to hardest based on proportion correct in the Spring 2012 administration.

38

Angoff Training

(cont.)

- The Angoff method begins with a thorough understanding of the standards and the ALDS
- The following slide provides three ALDS for the grade 8 NAEP Mathematics Assessment

39

NAEP Achievement Level Descriptors

Advanced	Students at this level can apply a range of reasoning skills to solve multistep problems. They can solve routine problems involving fractions and percents, recognize properties of basic geometric figures, and work with exponents and square roots. They can solve a variety of two-step problems using variables, identify equivalent algebraic expressions, and solve linear equations and inequalities. They are developing an understanding of functions and coordinate systems.
Proficient	Students at this level have an initial understanding of the four basic operations. They are able to apply whole number addition and subtraction skills to one-step word problems and money situations. In multiplication, they can find the product of a two-digit and a one-digit number. They can also compare information from graphs and charts, and are developing an ability to analyze simple logical relations.
Not Proficient	Students at this level know some basic addition and subtraction facts, and most can add two-digit numbers without regrouping. They recognize simple situations in which addition and subtraction apply. They also are developing rudimentary classification skills.

40

Angoff Training

(cont.)

Based on the ALDs, the panelists are asked to imagine a student who has received instruction based on the standards and is located on the boundary between the first two proficiency categories and answer the question "Will this hypothetical student be able to answer the item correctly?"

After recording the "yes / no" decision for the first item, the panelists are asked to go on to the next most difficult item. This decision process is repeated for every item on the test.

41

Angoff Training

(cont.)

Then the process is repeated for the boundary between the next two proficiency categories.

The raw cut score is defined as the sum of the "yes" responses for each proficiency boundary. Students with raw scores below the Not Proficient / Proficient raw cut score will be classified as Not Proficient. Students with raw scores at or above the Not Proficient / Proficient raw cut score will be classified as Proficient.

42

Angoff Training
(cont.)

The Item Information Sheet provides:

- The item location in the OIB
- The *p*-value (proportion correct) for spring 2012 examinees
- The key for the item
- The skill/subskill for the item

43

Angoff Training
(cont.)

Item Information Sheet

Name: OIB Number:

OIB Page	*p*-value	Key	Subskill	Notes
1	0.68	4(D)	3	
2	0.55	1(J)	5	
3	0.41	4(W)	1	
4	0.30	4(D)	2	
5	0.18	3(L)	4	

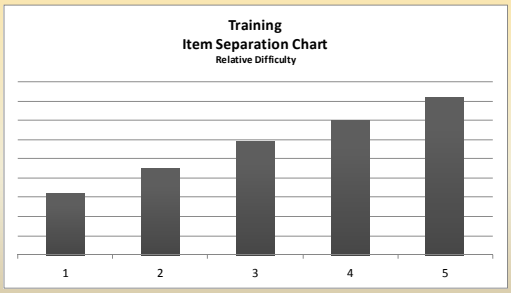
44

Angoff Training
(cont.)

The Item Separation Chart provides a visual representation of the item difficulty information provided in the Item Information Sheet

45

Angoff Training
(cont.)



46

Angoff Training
(cont.)

- Item Classification Sheet
  - For the standard setting, two total raw score cut points will be determined by your classification of each item in the OIB
    - 1st: Not Proficient / Proficient
    - 2nd: Proficient / Advanced
  - Record your decision for each item

47

Angoff Training
(cont.)

Item Classification Sheet

Name: OIB Number:

OIB Page	Round 1		Round 2		Round 3	
	NP/P	P/A	NP/P	P/A	NP/P	P/A
1						
2						
3						
4						
5						

48

Transitioning from Yes to No: The Region of Uncertainty

- Identify ***groups*** of items where that transition occurs
- It is very unusual to transition from all right to all wrong
- Do not focus on a single item
- Utilize the "item separation chart"

49

Angoff Training (cont.)

- Beginning with the first page in the OIB you will have to answer the question:
  - Would a student on the borderline between Not Proficient and Proficient answer this item correctly?
  - Use the Iowa ALDs to develop the borderline student

50

Angoff Training (cont.)

- Record your decision, Yes (Y) or No (N), on the classification form
- Turn the page and repeat this process with the second item in the OIB
- Continue this process until you reach the end of the OIB and you have recorded a Yes or No for every item for the Not Proficient / Proficient borderline student

51

Angoff Training (cont.)

- Go back to the first page in the OIB. You will repeat the process again from the first item to the last item. This time you will answer the question:
  - Would a student on the borderline between Proficient and Advanced answer this item correctly?
  - Use the Iowa ALDs to develop the borderline student

52

Angoff Training (cont.)

- Record your decision (Yes or No) on the classification form
- Turn the page and repeat this process with the second item in the OIB
- Continue this process until you reach the end of the OIB and you have recorded a Yes or No for every item for the Proficient / Advanced borderline student
- This completes the first round

53

Angoff Training (cont.)

- Rounds 2 and 3 will proceed in a similar fashion
- You will be provided additional information about the results of the previous round at the start of rounds 2 and 3 followed by a group discussion (table or room depending on the round)

54

Angoff Training
(cont.)

- After the discussion you will again make individual, not group decisions, about the performance of the hypothetical borderline student (Not Proficient / Proficient or Proficient / Advanced) on each item
- At the start of the next grade (the next day) you will receive information on the performance of the previously completed grades

55

Practice Exercise

56

Practice Steps

- Review the five sample Mathematics items
- Review the NAEP ALDs for Proficient and Not Proficient levels
- Visualize a student just barely out of the Not Proficient level and just barely into the Proficient level
- Indicate on the Sample Classification Form whether you would expect that student to answer the items correctly (Yes or No)
- Repeat the process for the Proficient and Advanced levels

57

Done?

58

Show of Hands!

59

Sample Results from OIB Classifications

The following are samples of the types of reports that you will receive after you finish each of the three rounds for each Subject / Grade combination

60

Sample Results (cont.)

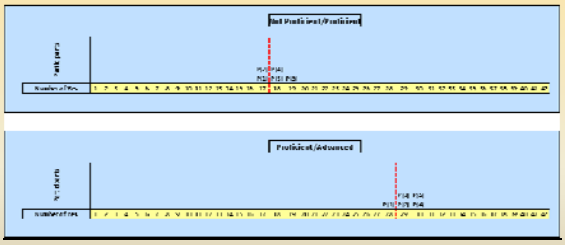
Results for Round 1 by Table

Participant's Number	Round 1		Round 2		Round 3	
	Proficient	Advanced	Proficient	Advanced	Proficient	Advanced
1	17	30	0	0	0	0
2	17	29	0	0	0	0
3	10	29	0	0	0	0
4	18	30	0	0	0	0
5	10	30	0	0	0	0
Minimum	17	28	0	0	0	0
Median	18	29	0	0	0	0
Median SE	0	0	0	0	0	0
Maximum	19	30	0	0	0	0

61

Sample Results (cont.)

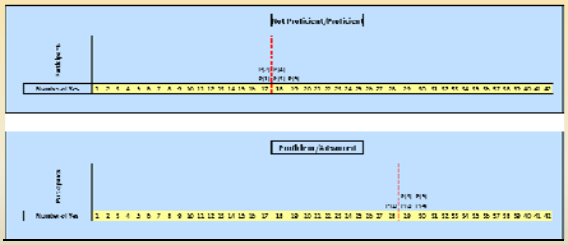
Results for Round 1 by Table



62

Sample Results (cont.)

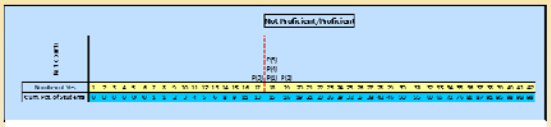
Results for Round 1 by Table

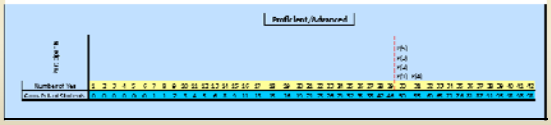


62

Sample Results (cont.)

Results for Round 2 by Table

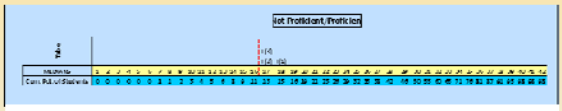


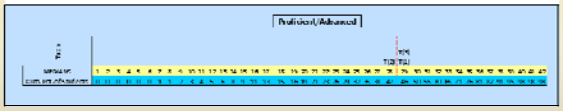


63

Sample Results (cont.)

Results for Round 2 across Tables

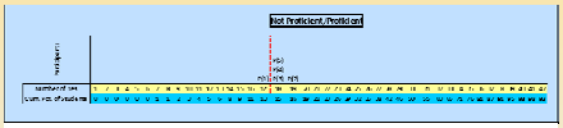


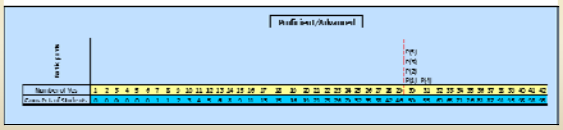


64

Sample Results (cont.)

Results for Round 3 by Table





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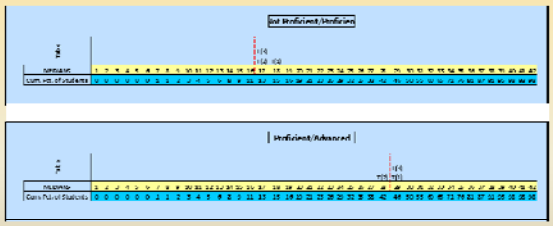
Sample Results (cont.)

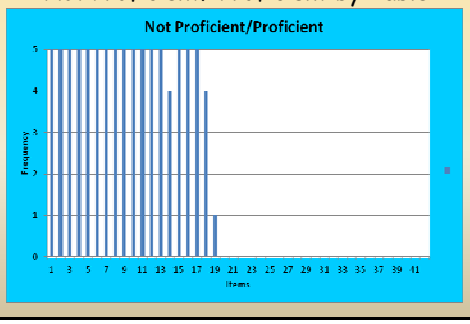
Results for Round 3 across Tables



66

Sample Results (cont.)

Consistency of Classification Round 1
Not Proficient/ Proficient by Table



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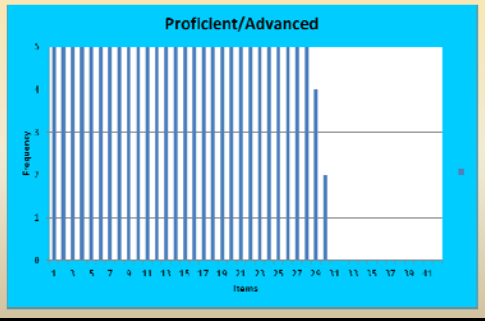
Sample Results (cont.)

Consistency of Classification Round 1
Proficient/ Advanced by Table



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Interpreting Cut Scores

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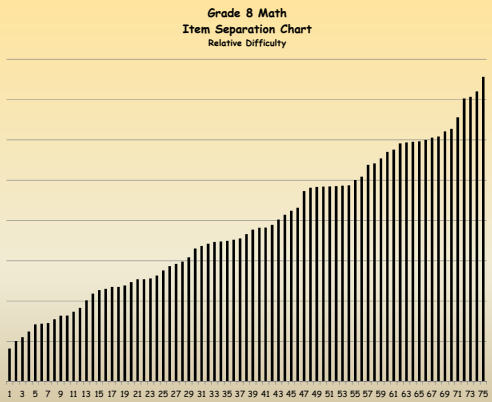
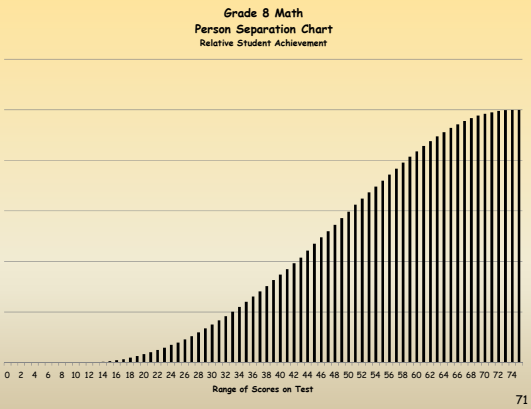
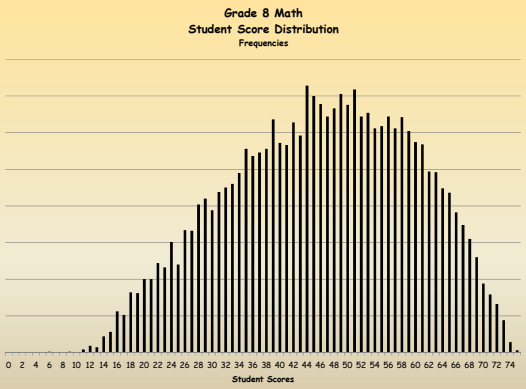


70



71



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What You May and May Not Discuss Outside of This Meeting

- You may discuss:
  - The processes used
  - ALDs
- You may **not** discuss:
  - The results
  - The contents of the secure materials
    - Items

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Questions?

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What's Next?

- Return Participant Survey, Confidentiality form and readiness survey sheets to staff at back of the room
- Proceed to breakout rooms as directed
- You have a grade listed on your folder
- This may not be the grade you currently teach

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What's Next?

- Today's grade groups

  Mathematics
  - Grades 3, 4, 5 work on grade 4 in Webster
  - Grades 6, 7, 8 work on grade 7 in Clayton
  - Grades 10, 11 and Higher Education work on grade 10 in Marion

  Reading
  - Grades 3, 4, 5 work on grade 4 in Shelby
  - Grades 6, 7, 8 work on grade 7 in Hancock
  - Grades 10, 11 and Higher Education work on grade 10 in Woodbury

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What's Next?

- Wednesday groups will be different and will be provided to you at the end of the day

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Appendix E: Readiness Survey

IOWA ASSESSMENTS
STANDARD SETTING MEETING
APRIL 2-4, 2013

READINESS SURVEY

Preparation and Training Activities	Strongly Disagree	Disagree	Agree	Strongly Agree
1) The goals for the Standard Setting were made clear.				
2) The Angoff Yes/No procedure was well described.				
3) I understand the Ordered Item Booklet (OIB).				
4) I understand the Item Information Sheet.				
5) I understand the Item Separation Chart.				
6) I understand the Person Separation Chart.				
7) The Achievement Level Descriptors will help me make my classifications.				
9) The practice activities were effective.				
10) Taking the test will help me make my classifications.				
11) The training on the Angoff Yes/No classifications made my task clear.				

THANK YOU FOR COMPLETING THIS SURVEY. PLEASE PLACE A CHECK IN THE BOX INDICATING YOUR LEVEL OF READINESS.

PLEASE CIRCLE YOUR RESPONSE AND INITIAL. THANK YOU

12) I have completed the training and I understand what I need to do to make my Round 1 classifications.

Yes No _____ Your Initials

13) I have completed the training and I understand how to use the classification form to record my Round 1 classifications.

Yes No _____ Your Initials

Only respond to the following if you answered "**No**" to questions 12 or 13.

14) If "No" did you receive additional training?

Yes No _____ Your Initials

15) Following the additional training, are you now ready to make your classifications and record the results on the Classification Form?

Yes No _____ Your Initials

_____ _____
Print Name Signature

Appendix F: Readiness Survey Results

Table F.1
Readiness Survey Results: Preparation and Training

Item	Valid *N*	Percent Selecting Category: Strongly Disagree	Disagree	Agree	Strongly Agree	Average[1]	*SD*
The goals for the Standard Setting were made clear.	116	2.59	2.59	54.31	40.52	3.33	0.66
The Angoff Yes/No procedure was well described.	115	2.61	0.00	53.04	44.35	3.39	0.63
I understand the OIB.	116	2.59	0.86	45.69	50.86	3.45	0.65
I understand the Item Information Sheet.	116	2.59	0.86	50.86	45.69	3.40	0.64
I understand the Item Separation Chart.	115	2.61	1.74	51.30	44.35	3.37	0.66
I understand the Person Separation Chart.	92	3.26	4.35	58.70	33.70	3.23	0.68
The ALDs will help me make my classifications.	115	2.61	1.74	39.13	56.52	3.50	0.67
The practice activities were effective.	113	2.65	3.54	61.95	31.86	3.23	0.64
Taking the test will help me make my classifications.	116	2.59	2.59	48.28	46.55	3.39	0.67
The training on the Angoff Yes/No classifications made my task clear.	116	2.59	2.59	57.76	37.07	3.29	0.65

[1] Strongly Disagree=1, Disagree=2, Agree=3, Strongly Agree=4

Table F.2
Readiness Survey Results: Overall Readiness

Item	Valid *N*	Percent Selecting Category: No	Yes	Average[1]	*SD*
I have completed the training and I understand what I need to do to make my Round 1 classifications.	116	0.00	100.00	1.00	0.00
I have completed the training and I understand how to use the classification form to record my Round 1 classifications.	116	0.00	100.00	1.00	0.00
(Only respond to the following if you answered "No" to questions 12 or 13.)					
If "No" did you receive additional training?	0	-	-	-	-
Following additional training, are you now ready to make your classifications and record the results on the Classification Form?	0	-	-	-	-

[1] Yes=1, No=2

Appendix G: Panelist Cut Scores by Round

Table G.1
Classification Results after Each Round: Reading Grade 3

	Round 1		Round 2		Round 3	
Panelist	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	27	39	24	36	23	37
2	23	35	23	34	20	34
3	25	34	25	34	24	32
4	24	38	21	36	21	37
5	15	30	16	32	16	35
Table Median	24	35	23	34	21	35
Table 2						
1	21	33	20	33	20	31
2	13	28	18	29	21	30
3	25	36	21	35	20	34
4	21	34	21	34	21	34
Table Median	21	34	21	34	21	33
Table 3						
1	18	35	18	35	18	35
2	16	33	18	33	18	33
3	10	30	12	34	11	34
4	20	37	18	37	18	36
5	17	39	16	34	16	34
Table Median	17	35	18	34	18	34
Group Median	21	35	21	35	21	34

Table G.2
Classification Results after Each Round: Reading Grade 4

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	25	37	23	40	23	39
2	28	41	25	42	25	42
3	22	40	21	39	21	39
4	24	39	27	39	28	39
5	24	40	23	41	22	42
6	17	38	23	40	24	40
7	19	29	23	35	23	36
Table Median	24	39	23	40	23	39
Table 2						
1	20	35	20	32	20	34
2	19	33	19	34	20	33
3	18	34	19	33	19	37
4	28	37	24	38	26	38
5	23	37	25	37	24	36
6	18	37	19	39	18	36
Table Median	20	36	20	36	20	36
Table 3						
1	18	37	15	38	14	38
2	22	37	12	35	14	38
3	10	39	13	38	13	39
4	10	30	13	39	12	35
5	25	34	11	37	15	36
6	17	37	15	36	15	35
Table Median	18	37	13	38	14	37
Group Median	20	37	20	38	20	37

Table G.3
Classification Results after Each Round: Reading Grade 5

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	27	37	22	38	22	38
2	20	41	21	38	21	38
3	23	34	21	37	21	37
4	16	38	21	38	21	38
5	26	38	20	38	20	38
6	27	39	23	38	23	38
Table Median	25	38	21	38	21	38
Table 2						
1	25	39	27	40	27	40
2	34	43	32	41	32	42
3	30	41	28	40	28	40
4	18	37	25	39	25	38
5	25	37	25	40	25	40
6	28	41	25	40	23	40
Table Median	27	40	26	40	26	40
Table 3						
1	27	38	23	38	23	38
2	29	40	23	39	23	39
3	20	39	22	36	22	36
4	28	37	24	38	24	38
5	20	38	22	36	22	36
6	22	33	25	38	25	38
Table Median	25	38	23	38	23	38
Group Median	25	38	23	38	23	38

Table G.4
Classification Results after Each Round: Reading Grade 6

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	25	39	25	39	25	39
2	26	42	27	41	27	41
3	20	38	25	39	25	39
4	26	40	28	40	28	40
5	24	36	27	38	27	38
Table Median	25	39	27	39	27	39
Table 2						
1	29	40	25	37	25	38
2	31	38	27	38	27	37
3	30	38	25	37	25	36
4	23	38	23	39	23	37
5	19	36	21	39	21	38
Table Median	29	38	25	38	25	37
Table 3						
1	18	32	17	35	17	35
2	24	38	22	37	23	37
3	20	42	21	39	21	39
4	25	42	19	35	19	35
5	20	33	18	35	26	35
Table Median	20	38	19	35	21	35
Group Median	25	38	25	38	25	37

Table G.5
Classification Results after Each Round: Reading Grade 7

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	25	37	24	37	22	37
2	19	39	20	36	21	38
3	23	38	24	38	24	38
4	27	42	23	40	23	39
5	22	41	24	41	24	41
Table Median	23	39	24	38	23	38
Table 2						
1	17	37	17	37	17	37
2	20	39	20	34	13	35
3	20	34	20	39	20	41
4	22	41	21	40	21	40
5	22	37	23	32	23	31
6	20	41	19	41	21	42
Table Median	20	38	20	38	21	39
Table 3						
1	17	36	18	41	18	41
2	18	39	19	37	19	42
3	26	38	20	29	21	40
4	21	34	20	34	16	35
5	18	41	19	43	19	44
Table Median	18	38	19	37	19	41
Group Median	20	38	20	38	21	38

Table G.6
Classification Results after Each Round: Reading Grade 8

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	16	42	20	43	20	43
2	28	37	27	35	27	37
3	15	32	15	35	15	35
4	25	40	32	42	32	42
5	25	39	27	41	27	42
6	20	41	22	35	23	41
7	31	41	26	41	26	41
Table Median	25	40	26	41	26	41
Table 2						
1	36	44	30	43	30	43
2	39	46	31	45	31	45
3	25	39	26	42	26	42
4	25	43	27	39	27	39
5	25	38	27	41	27	41
6	26	42	25	42	25	42
7	23	38	26	39	26	39
Table Median	25	42	27	42	27	42
Table 3						
1	33	40	35	43	35	43
2	34	43	33	44	33	44
3	32	42	33	43	33	43
4	34	43	32	46	32	46
5	26	44	33	43	33	43
6	21	39	27	44	29	44
Table Median	33	43	33	44	33	44
Group Median	25	42	27	42	27	42

Table G.7
Classification Results after Each Round: Reading Grade 10

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	17	33	17	33	20	34
2	25	31	20	32	20	34
3	26	40	23	38	23	38
4	12	25	14	27	22	32
5	17	31	18	35	18	35
6	34	38	17	39	18	39
Table Median	21	32	18	34	20	35
Table 2						
1	18	31	16	31	16	30
2	17	28	16	29	15	31
3	17	35	17	37	17	37
4	16	28	15	19	15	26
5	25	38	19	37	19	37
Table Median	17	31	16	31	16	31
Table 3						
1	20	34	25	35	22	35
2	18	32	23	35	23	35
3	21	33	24	35	23	35
4	27	34	25	35	24	35
5	18	35	25	36	24	36
Table Median	20	34	25	35	23	35
Group Median	20	32	18	34	20	35

Table G.8
Classification Results after Each Round: Reading Grade 11

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	19	38	25	37	25	37
2	18	33	22	35	22	35
3	18	32	24	37	24	37
4	29	40	28	37	28	37
5	26	34	25	36	25	36
6	31	40	25	38	25	38
7	28	40	26	37	27	37
Table Median	26	38	25	37	25	37
Table 2						
1	29	36	27	36	26	36
2	17	37	21	38	22	38
3	31	39	31	39	31	39
4	20	36	25	36	25	36
5	27	38	26	38	26	38
6	24	35	23	36	24	36
Table Median	26	37	26	37	26	37
Table 3						
1	27	37	25	37	25	37
2	11	34	24	40	25	36
3	25	34	25	36	25	36
4	24	36	25	38	25	38
5	25	36	24	37	24	37
6	32	38	31	38	30	38
7	18	33	17	33	21	33
Table Median	25	36	25	37	25	37
Group Median	25	37	25	37	25	37

Table G.9
Classification Results after Each Round: Math Grade 3

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	29	44	30	44	30	42
2	27	48	30	42	30	41
3	31	42	31	42	30	41
4	27	40	30	42	30	41
5	25	41	30	42	30	41
Table Median	27	42	30	42	30	41
Table 2						
1	39	40	34	40	34	41
2	36	41	34	41	34	41
3	29	38	33	40	32	39
4	32	47	33	44	34	45
Table Median	34	41	34	41	34	42
Table 3						
1	32	44	30	39	30	39
2	25	39	29	39	30	39
3	36	42	34	42	32	41
4	22	37	29	36	30	38
Table Median	29	41	30	39	31	39
Group Median	29	41	30	41	30	41

Table G.10
Classification Results after Each Round: Math Grade 4

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	31	49	32	49	27	47
2	40	52	32	52	29	50
3	34	50	31	51	29	50
4	36	50	33	52	29	50
5	21	50	30	52	29	49
Table Median	34	50	32	52	29	50
Table 2						
1	29	45	34	49	29	47
2	34	49	32	50	30	48
3	37	52	32	51	30	48
4	25	42	32	49	30	49
Table Median	32	47	32	50	30	48
Table 3						
1	25	45	23	43	25	46
2	25	50	24	44	26	46
3	27	47	27	44	29	46
4	15	40	22	43	25	46
Table Median	25	46	24	44	26	46
Group Median	32	47	32	50	29	48

Table G.11
Classification Results after Each Round: Math Grade 5

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	42	54	38	50	37	50
2	36	48	40	49	35	48
3	40	53	40	49	40	49
4	40	52	40	50	39	51
5	35	50	38	47	37	49
6	49	59	41	52	41	52
Table Median	40	53	40	50	38	50
Table 2						
1	40	52	41	53	40	52
2	46	54	43	51	43	51
3	38	49	39	51	37	51
4	36	46	39	50	36	49
5	47	53	41	50	41	50
Table Median	40	52	41	51	40	51
Table 3						
1	44	51	42	50	42	49
2	51	53	45	50	45	50
3	49	53	45	51	45	50
4	39	51	41	50	41	49
5	31	50	44	50	38	47
Table Median	44	51	44	50	42	49
Group Median	40	52	41	50	40	50

Table G.12
Classification Results after Each Round: Math Grade 6

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	45	51	43	49	38	46
2	41	49	41	48	41	48
3	38	48	38	51	39	50
Table Median	41	49	41	49	39	48
Table 2						
1	34	57	33	55	33	56
2	44	57	39	57	37	56
3	32	50	31	54	31	54
Table Median	34	57	33	55	33	56
Table 3						
1	47	61	37	53	38	54
2	31	52	35	56	37	57
3	35	45	33	53	34	53
Table Median	35	52	35	53	37	54
Group Median	35	52	35	53	37	54

Table G.13
Classification Results after Each Round: Math Grade 7

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	23	55	42	61	39	57
2	47	61	42	61	40	58
3	44	63	44	63	39	58
Table Median	44	61	42	61	39	58
Table 2						
1	48	66	36	63	40	60
2	31	60	47	65	40	63
3	42	59	40	57	36	51
Table Median	42	60	40	63	40	60
Table 3						
1	44	67	50	57	48	60
2	62	66	40	65	38	63
3	48	69	49	68	43	59
Table Median	48	67	49	65	43	60
Group Median	44	61	42	63	40	60

Table G.14
Classification Results after Each Round: Math Grade 8

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	56	71	52	71	50	70
2	62	72	57	71	59	72
3	50	69	50	69	48	66
4	56	73	55	68	54	68
Table Median	56	72	54	70	52	69
Table 2						
1	43	65	42	65	52	66
2	44	63	42	63	40	61
3	35	65	38	64	39	65
4	42	68	36	63	46	64
Table Median	43	65	40	64	43	65
Table 3						
1	32	64	48	65	47	66
2	61	67	58	65	67	66
3	65	73	59	69	55	69
4	61	73	61	70	58	69
Table Median	61	70	59	67	57	68
Group Median	56	70	54	67	52	68

Table G.15
Classification Results after Each Round: Math Grade 10

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	13	27	15	33	18	35
2	16	31	16	34	17	34
3	20	32	17	35	19	35
Table Median	16	31	16	34	18	35
Table 2						
1	26	38	15	33	18	33
2	15	31	18	36	21	36
3	13	28	15	36	15	36
Table Median	15	31	15	36	18	36
Table 3						
1	30	37	29	37	29	37
2	21	32	24	33	18	33
Table Median	26	35	27	35	24	35
Group Median	16	31	16	35	18	35

Table G.16
Classification Results after Each Round: Math Grade 11

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	17	34	21	37	20	37
2	23	37	23	37	23	37
3	28	39	26	36	25	36
Table Median	23	37	23	37	23	37
Table 2						
1	28	35	27	35	27	35
2	27	33	28	35	28	35
3	27	39	27	37	24	36
Table Median	27	35	27	35	27	35
Table 3						
1	25	35	20	35	20	35
2	18	32	18	34	18	32
Table Median	22	34	19	35	19	34
Group Median	23	35	23	35	23	35

Table G.17
Classification Results after Each Round: Science Grade 5

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	14	27	11	26	11	26
2	18	29	16	33	16	31
3	17	30	16	30	18	31
4	25	32	19	31	22	31
Table Median	18	30	16	31	17	31
Table 2						
1	20	32	22	33	22	33
2	15	28	21	32	20	32
3	26	33	23	32	23	32
Table Median	20	32	22	32	22	32
Table 3						
1	23	32	14	29	15	29
2	14	30	13	29	13	28
3	16	26	14	27	15	27
Table Median	16	30	14	29	15	28
Group Median	18	30	16	31	17	31

Table G.18

Classification Results after Each Round: Science Grade 8

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	31	38	30	39	30	39
2	25	41	29	38	28	30
3	25	33	27	35	20	31
4	36	41	30	38	27	37
Table Median	28	40	30	38	28	34
Table 2						
1	29	43	31	43	29	43
2	30	38	29	41	30	43
3	27	43	23	40	27	40
Table Median	29	43	29	41	29	43
Table 3						
1	19	38	23	39	27	40
2	26	35	21	34	21	34
3	22	35	22	38	25	40
Table Median	22	35	22	34	25	40
Group Median	28	40	29	38	28	40

Table G.19
Classification Results after Each Round: Science Grade 11

Panelist	Round 1		Round 2		Round 3	
	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced	Not Proficient/ Proficient	Proficient/ Advanced
Table 1						
1	19	39	15	35	15	36
2	30	45	19	37	17	38
3	17	33	20	40	13	27
4	24	41	22	36	24	38
Table Median	22	40	20	37	16	37
Table 2						
1	31	43	23	39	23	39
2	27	44	22	37	22	37
3	27	45	23	38	23	44
4	18	38	21	36	20	34
5	24	40	22	38	22	38
Table Median	27	43	22	38	22	38
Table 3						
1	30	40	30	43	30	43
2	25	40	27	45	27	45
3	28	44	31	44	31	45
4	18	32	24	44	23	36
5	16	40	16	40	16	40
Table Median	25	40	27	44	27	43
Group Median	25	40	22	38	22	38

Appendix H: Sample Evaluation Form

Iowa Assessments- Science
Standard Setting Meeting
April 3, 2013
Evaluation Form

THE PURPOSE OF THIS EVALUATION IS TO OBTAIN YOUR OPINIONS ABOUT THE STANDARD SETTING MEETING. YOUR OPINION WILL PROVIDE A BASIS FOR EVALUATING THE PROCESS. PLEASE DO NOT PUT YOUR NAME ON THIS FORM. WE WANT YOUR OPINIONS TO REMAIN ANONYMOUS. AND ALSO NOTE, IN ORDER FOR YOUR ANSWERS TO BE INCLUDED PLEASE CLEARLY STATE YOUR RESPONSE.

1. Grade Level:

5 **8** **11**

2. Circle the phrase that most accurately reflects your satisfaction with the training.

Clarity	**Not at all**	**Somewhat**	**Adequate**	**Totally clear**
Amount of Time	**Way too little**	**Too Little**	**Appropriate**	**Too Much**
Practice Exercises	**Not Useful**	**Somewhat Useful**	**Useful**	**Very Useful**

3. Check the column that most accurately reflects your level of agreement regarding the Achievement Level Descriptors (ALDs).

	Strongly Disagree	Disagree	Agree	Strongly Agree
Adequate information was provided to participants regarding the ALDs.				
Adequate time was provided for participants to gain understanding of the ALDs.				
The ALDs capture what students should know and be able to do at each grade level.				
The ALDs communicate a reasonable profile of students' achievement at Not Proficient, Proficient, and Advanced.				
The ALDs were helpful in making decisions regarding cut-points.				

4. Check the column that most accurately reflects your opinion regarding the usefulness of the following materials.

Materials	Not Useful	Somewhat Useful	Useful	Very Useful
Operational Test Book				
Ordered Item Booklet				
Item Separation Chart				
Item Information Sheet				
Person Separation Chart				

Student Score Distribution				
Statistical Impact Data				

5. Check the column that most accurately reflects your opinion regarding the amount of time allotted for your ratings.

Time Allotted	Too Little Time	About Right	Too Much Time
Round 1			
Round 2			
Round 3			

6. Check the column that most accurately reflects your satisfaction with the following roles.

Role	Not Satisfied	Somewhat Satisfied	Satisfied	Very Satisfied
DRC Psychometric Lead				
DRC Room Facilitator				
Other DRC Staff				

7. Check the column that most accurately reflects the level of confidence you had in determining the location for each assessment cut-point. Please only indicate confidence level for the grades in which you participated. Otherwise, leave it blank.

Grade	Cut-Point Location	Not Confident	Partially Confident	Confident	Very Confident
5	**Not Proficient/Proficient**				
	Proficient/Advanced				
8	**Not Proficient/Proficient**				
	Proficient/Advanced				
11	**Not Proficient/Proficient**				
	Proficient/Advanced				

8. How confident are you that the processes and methods used will produce valid results?

Not Confident **Somewhat Confident** **Confident** **Very Confident**

9. If you have further comments or suggestions for ways to improve the standard setting meeting, please do so in the space below. All comments will remain anonymous.

THANK YOU FOR PARTICIPATING IN THE STANDARD SETTING MEETING.

Appendix I: Evaluation Form Results

Table I.1
Question 2a – Circle the phrase that most accurately reflects your satisfaction with the training: Clarity

Subject	Grade[1]	Valid *N*	Percent Selecting Category				Average[2]	*SD*
			Not at All	Somewhat	Adequate	Totally Clear		
Reading	4	18	0.00	33.33	50.00	16.67	2.83	0.71
	7	16	0.00	12.50	75.00	12.50	3.00	0.52
	10	15	0.00	20.00	53.33	26.67	3.07	0.70
	ALL	49	0.00	22.45	59.18	18.37	2.96	0.64
Mathematics	4	13	0.00	15.38	38.46	46.15	3.31	0.75
	7	9	0.00	0.00	33.33	66.67	3.67	0.50
	10	8	0.00	0.00	87.50	12.50	3.13	0.35
	ALL	30	0.00	6.67	50.00	43.33	3.37	0.61
Science	5	10	0.00	20.00	30.00	50.00	3.30	0.82
	8	9	11.11	11.11	33.33	44.44	3.11	1.05
	11	14	7.14	21.43	71.43	0.00	2.64	0.63
	ALL	33	6.06	18.18	48.48	27.27	2.97	0.85
ALL	ALL	112	1.79	16.96	53.57	27.68	3.07	0.72

[1] Only grades that immediately followed training are included.
[2] Not at All=1, Somewhat=2, Adequate=3, Totally Clear=4

Table I.2
Question 2b – Circle the phrase that most accurately reflects your satisfaction with the training: Amount of Time

Subject	Grade[1]	Valid *N*	Percent Selecting Category: Way too Little	Too Little	Approp-riate	Too Much	Average[2]	*SD*
Reading	4	19	0.00	0.00	57.89	42.11	3.42	0.51
	7	16	0.00	0.00	68.75	31.25	3.31	0.48
	10	15	0.00	20.00	73.33	6.67	2.87	0.52
	ALL	50	0.00	6.00	66.00	28.00	3.22	0.55
Mathematics	4	12	0.00	8.33	66.67	25.00	3.17	0.58
	7	9	0.00	0.00	77.78	22.22	3.22	0.44
	10	8	0.00	12.50	75.00	12.50	3.00	0.53
	ALL	29	0.00	6.90	72.41	20.69	3.14	0.52
Science	5	10	0.00	0.00	100.00	0.00	3.00	0.00
	8	9	11.11	22.22	33.33	33.33	2.89	1.05
	11	14	0.00	14.29	85.71	0.00	2.86	0.36
	ALL	33	3.03	12.12	75.76	9.09	2.91	0.00
ALL	ALL	112	0.89	8.04	70.54	20.54	3.11	0.56

[1] Only grades that immediately followed training are included.
[2] Way too Little=1, Too Little=2, Appropriate=3, Too Much=4

Table I.3
Question 2c – Circle the phrase that most accurately reflects your satisfaction with the training: Practice Exercises

Subject	Grade[1]	Valid *N*	Percent Selecting Category: Not Useful	Somewhat Useful	Useful	Very Useful	Average[2]	*SD*
Reading	4	19	0.00	21.05	57.89	21.05	3.00	0.67
	7	16	6.25	31.25	56.25	6.25	2.63	0.72
	10	16	6.25	12.50	50.00	31.25	3.06	0.85
	ALL	51	3.92	21.57	54.90	19.61	2.90	0.76
Mathematics	4	12	0.00	16.67	66.67	16.67	3.00	0.60
	7	9	0.00	0.00	66.67	33.33	3.33	0.50
	10	8	0.00	12.50	75.00	12.50	3.00	0.53
	ALL	29	0.00	10.34	68.97	20.69	3.10	0.56
Science	5	10	0.00	30.00	60.00	10.00	2.80	0.63
	8	9	0.00	22.22	55.56	22.22	3.00	0.71
	11	14	0.00	35.71	50.00	14.29	2.79	0.70
	ALL	33	0.00	30.30	54.55	15.15	2.85	0.67
ALL	ALL	113	1.77	21.24	58.41	18.58	2.94	0.69

[1] Only grades that immediately followed training are included.
[2] Not Useful=1, Somewhat Useful=2, Useful=3, Very Useful=4

Table I.4
Question 3a – Adequate information was provided to participants regarding the ALDs.

Subject	Grade	Valid *N*	Percent Selecting Category: Strongly Disagree	Disagree	Agree	Strongly Agree	Average[1]	*SD*
Reading	3	14	0.00	0.00	71.43	28.57	3.29	0.47
	4	19	0.00	0.00	73.68	26.32	3.26	0.45
	5	15	0.00	0.00	86.67	13.33	3.13	0.35
	6	16	0.00	0.00	68.75	31.25	3.31	0.48
	7	16	0.00	0.00	68.75	31.25	3.31	0.48
	8	20	5.00	5.00	60.00	30.00	3.15	0.75
	10	16	0.00	0.00	87.50	12.50	3.13	0.34
	11	19	0.00	5.26	78.95	15.79	3.11	0.46
	ALL	135	0.74	1.48	74.07	23.70	3.21	0.49
Mathematics	3	13	0.00	0.00	76.92	23.08	3.23	0.44
	4	13	7.69	23.08	69.23	0.00	2.62	0.65
	5	16	0.00	0.00	87.50	12.50	3.13	0.34
	6	9	0.00	0.00	55.56	44.44	3.44	0.53
	7	9	0.00	0.00	44.44	55.56	3.56	0.53
	8	12	0.00	0.00	58.33	41.67	3.42	0.51
	10	8	0.00	0.00	62.50	37.50	3.38	0.52
	11	8	0.00	0.00	62.50	37.50	3.38	0.52
	ALL	88	1.14	3.41	67.05	28.41	3.23	0.56
Science	5	10	0.00	10.00	80.00	10.00	3.00	0.47
	8	9	0.00	11.11	66.67	22.22	3.11	0.60
	11	14	0.00	0.00	85.71	14.29	3.14	0.36
	ALL	33	0.00	6.06	78.79	15.15	3.09	0.46
ALL	ALL	256	0.78	2.73	72.27	24.22	3.20	0.51

[1] Strongly Disagree=1, Disagree=2, Agree=3, Strongly Agree=4

Table I.5
Question 3b – Adequate time was provided for participants to gain understanding of the ALDs.

Subject	Grade	Valid *N*	Percent Selecting Category: Strongly Disagree	Disagree	Agree	Strongly Agree	Average[1]	*SD*
Reading	3	14	0.00	0.00	64.29	35.71	3.36	0.50
	4	19	0.00	5.26	63.16	31.58	3.26	0.56
	5	15	0.00	0.00	86.67	13.33	3.13	0.35
	6	10	0.00	0.00	70.00	30.00	3.30	0.48
	7	16	0.00	0.00	68.75	31.25	3.31	0.48
	8	20	5.00	5.00	55.00	35.00	3.20	0.77
	10	16	0.00	0.00	81.25	18.75	3.19	0.40
	11	19	0.00	5.26	73.68	21.05	3.16	0.50
	ALL	129	0.78	2.33	69.77	27.13	3.23	0.52
Mathematics	3	13	0.00	0.00	76.92	23.08	3.23	0.44
	4	13	0.00	0.00	100.00	0.00	3.00	0.00
	5	16	0.00	18.75	75.00	6.25	2.88	0.50
	6	9	0.00	0.00	44.44	55.56	3.56	0.53
	7	9	0.00	0.00	33.33	66.67	3.67	0.50
	8	12	0.00	0.00	50.00	50.00	3.50	0.52
	10	8	0.00	0.00	50.00	50.00	3.50	0.53
	11	8	0.00	0.00	37.50	62.50	3.63	0.52
	ALL	88	0.00	3.41	62.50	34.09	3.31	0.53
Science	5	10	0.00	30.00	60.00	10.00	2.80	0.63
	8	9	0.00	11.11	66.67	22.22	3.11	0.60
	11	14	0.00	14.29	64.29	21.43	3.07	0.62
	ALL	33	0.00	18.18	63.64	18.18	3.00	0.61
ALL	ALL	250	0.40	4.80	66.40	28.40	3.23	0.55

[1] Strongly Disagree=1, Disagree=2, Agree=3, Strongly Agree=4

Table I.6

Question 3c – The ALDs capture what students should know and be able to do at each grade level.

Subject	Grade	Valid *N*	Percent Selecting Category: Strongly Disagree	Disagree	Agree	Strongly Agree	Average[1]	*SD*
Reading	3	14	0.00	7.14	64.29	28.57	3.21	0.58
	4	19	0.00	5.26	63.16	31.58	3.26	0.56
	5	15	0.00	6.67	80.00	13.33	3.07	0.46
	6	10	0.00	30.00	50.00	20.00	2.90	0.74
	7	16	0.00	25.00	62.50	12.50	2.88	0.62
	8	20	15.00	15.00	45.00	25.00	2.80	1.01
	10	16	12.50	6.25	75.00	6.25	2.75	0.77
	11	19	10.53	0.00	78.95	10.53	2.89	0.74
	ALL	129	5.43	10.85	65.12	18.60	2.97	0.72
Mathematics	3	13	0.00	0.00	84.62	15.38	3.15	0.38
	4	13	0.00	53.85	46.15	0.00	2.46	0.52
	5	16	0.00	18.75	75.00	6.25	2.88	0.50
	6	9	0.00	0.00	77.78	22.22	3.22	0.44
	7	9	0.00	11.11	77.78	11.11	3.00	0.50
	8	12	0.00	8.33	50.00	41.67	3.33	0.65
	10	8	0.00	25.00	37.50	37.50	3.13	0.83
	11	8	0.00	25.00	50.00	25.00	3.00	0.76
	ALL	88	0.00	18.18	63.64	18.18	3.00	0.61
Science	5	10	0.00	30.00	70.00	0.00	2.70	0.48
	8	9	0.00	0.00	88.89	11.11	3.11	0.33
	11	14	7.14	28.57	57.14	7.14	2.64	0.74
	ALL	33	3.03	21.21	69.70	6.06	2.79	0.60
ALL	ALL	250	3.20	14.80	65.20	16.80	2.96	0.67

[1] Strongly Disagree=1, Disagree=2, Agree=3, Strongly Agree=4

Table I.7
Question 3d – The ALDs communicate a reasonable profile of students' achievement at Not Proficient, Proficient, and Advanced.

Subject	Grade	Valid *N*	Percent Selecting Category: Strongly Disagree	Disagree	Agree	Strongly Agree	Average[1]	*SD*
Reading	3	14	0.00	14.29	57.14	28.57	3.14	0.66
	4	19	0.00	10.53	52.63	36.84	3.26	0.65
	5	15	0.00	6.67	73.33	20.00	3.13	0.52
	6	10	0.00	30.00	50.00	20.00	2.90	0.74
	7	15	0.00	20.00	73.33	6.67	2.87	0.52
	8	20	20.00	5.00	55.00	20.00	2.75	1.02
	10	16	6.25	18.75	62.50	12.50	2.81	0.75
	11	19	5.26	0.00	78.95	15.79	3.05	0.62
	ALL	128	4.69	11.72	63.28	20.31	2.99	0.72
Mathematics	3	13	0.00	15.38	69.23	15.38	3.00	0.58
	4	13	0.00	53.85	46.15	0.00	2.46	0.52
	5	16	0.00	18.75	75.00	6.25	2.88	0.50
	6	9	0.00	0.00	77.78	22.22	3.22	0.44
	7	9	0.00	22.22	66.67	11.11	2.89	0.60
	8	12	0.00	16.67	41.67	41.67	3.25	0.75
	10	8	0.00	25.00	37.50	37.50	3.13	0.83
	11	8	0.00	25.00	37.50	37.50	3.13	0.83
	ALL	88	0.00	22.73	57.95	19.32	2.97	0.65
Science	5	10	0.00	10.00	90.00	0.00	2.90	0.32
	8	9	0.00	0.00	88.89	11.11	3.11	0.33
	11	14	0.00	42.86	42.86	14.29	2.71	0.73
	ALL	33	0.00	21.21	69.70	9.09	2.88	0.55
ALL	ALL	249	2.41	16.87	62.25	18.47	2.97	0.67

[1] Strongly Disagree=1, Disagree=2, Agree=3, Strongly Agree=4

Table I.8
Question 3e – The ALDs were helpful in making decisions regarding cut-points.

Subject	Grade	Valid *N*	Percent Selecting Category: Strongly Disagree	Disagree	Agree	Strongly Agree	Average[1]	*SD*
Reading	3	14	0.00	7.14	71.43	21.43	3.14	0.53
	4	19	0.00	0.00	57.89	42.11	3.42	0.51
	5	15	0.00	0.00	80.00	20.00	3.20	0.41
	6	10	0.00	20.00	40.00	40.00	3.20	0.79
	7	15	0.00	13.33	73.33	13.33	3.00	0.53
	8	20	10.00	10.00	60.00	20.00	2.90	0.85
	10	16	0.00	6.25	75.00	18.75	3.13	0.50
	11	19	5.26	5.26	73.68	15.79	3.00	0.67
	ALL	128	2.34	7.03	67.19	23.44	3.12	0.62
Mathematics	3	13	0.00	7.69	76.92	15.38	3.08	0.49
	4	13	0.00	23.08	69.23	7.69	2.85	0.55
	5	16	0.00	0.00	87.50	12.50	3.13	0.34
	6	9	0.00	22.22	55.56	22.22	3.00	0.71
	7	8	0.00	0.00	100.00	0.00	3.00	0.00
	8	12	8.33	33.33	25.00	33.33	2.83	1.03
	10	8	12.50	50.00	12.50	25.00	2.50	1.07
	11	8	25.00	50.00	0.00	25.00	2.25	1.16
	ALL	87	4.60	20.69	57.47	17.24	2.87	0.74
Science	5	10	0.00	0.00	90.00	10.00	3.10	0.32
	8	9	0.00	0.00	77.78	22.22	3.22	0.44
	11	14	7.14	21.43	64.29	7.14	2.71	0.73
	ALL	33	3.03	9.09	75.76	12.12	2.97	0.59
ALL	ALL	248	3.23	12.10	64.92	19.76	3.01	0.67

[1] Strongly Disagree=1, Disagree=2, Agree=3, Strongly Agree=4

Table I.9

Question 4a – Check the column that most accurately reflects your opinion regarding the usefulness of the following materials: Operational Test Book

Subject	Grade	Valid *N*	Percent Selecting Category: Not Useful	Somewhat Useful	Useful	Very Useful	Average[1]	*SD*
Reading	3	13	0.00	0.00	76.92	23.08	3.23	0.44
	4	19	0.00	10.53	47.37	42.11	3.32	0.67
	5	13	0.00	0.00	84.62	15.38	3.15	0.38
	6	11	0.00	0.00	54.55	45.45	3.45	0.52
	7	16	6.25	12.50	50.00	31.25	3.06	0.85
	8	20	0.00	5.00	40.00	55.00	3.50	0.61
	10	16	0.00	6.25	31.25	62.50	3.56	0.63
	11	19	0.00	5.26	57.89	36.84	3.32	0.58
	ALL	127	0.79	5.51	53.54	40.16	3.33	0.62
Mathematics	3	13	0.00	0.00	69.23	30.77	3.31	0.48
	4	13	0.00	7.69	61.54	30.77	3.23	0.60
	5	16	0.00	0.00	75.00	25.00	3.25	0.45
	6	9	0.00	0.00	33.33	66.67	3.67	0.50
	7	8	0.00	0.00	25.00	75.00	3.75	0.46
	8	12	0.00	0.00	33.33	66.67	3.67	0.49
	10	7	0.00	0.00	14.29	85.71	3.86	0.38
	11	8	0.00	0.00	50.00	50.00	3.50	0.53
	ALL	86	0.00	1.16	50.00	48.84	3.48	0.53
Science	5	10	10.00	0.00	70.00	20.00	3.00	0.82
	8	9	0.00	11.11	44.44	44.44	3.33	0.71
	11	14	0.00	21.43	35.71	42.86	3.21	0.80
	ALL	33	3.03	12.12	48.48	36.36	3.18	0.77
ALL	ALL	246	0.81	4.88	51.63	42.68	3.36	0.62

[1] Not Useful=1, Somewhat Useful=2, Useful=3, Very Useful=4

Table I.10

Question 4b – Check the column that most accurately reflects your opinion regarding the usefulness of the following materials: Ordered Item Booklet

Subject	Grade	Valid *N*	Percent Selecting Category: Not Useful	Somewhat Useful	Useful	Very Useful	Average[1]	*SD*
Reading	3	14	0.00	0.00	57.14	42.86	3.43	0.51
	4	19	0.00	5.26	47.37	47.37	3.42	0.61
	5	14	0.00	0.00	50.00	50.00	3.50	0.52
	6	11	0.00	0.00	45.45	54.55	3.55	0.52
	7	16	6.25	6.25	43.75	43.75	3.25	0.86
	8	20	0.00	5.00	35.00	60.00	3.55	0.60
	10	16	0.00	6.25	18.75	75.00	3.69	0.60
	11	19	0.00	0.00	57.89	42.11	3.42	0.51
	ALL	129	0.78	3.10	44.19	51.94	3.47	0.60
Mathematics	3	13	0.00	0.00	69.23	30.77	3.31	0.48
	4	13	0.00	0.00	61.54	38.46	3.38	0.51
	5	16	0.00	0.00	62.50	37.50	3.38	0.50
	6	9	0.00	0.00	22.22	77.78	3.78	0.44
	7	8	0.00	0.00	0.00	100.00	4.00	0.00
	8	12	0.00	0.00	25.00	75.00	3.75	0.45
	10	8	0.00	0.00	12.50	87.50	3.88	0.35
	11	8	0.00	0.00	25.00	75.00	3.75	0.46
	ALL	87	0.00	0.00	40.23	59.77	3.60	0.49
Science	5	10	0.00	0.00	60.00	40.00	3.40	0.52
	8	9	0.00	11.11	44.44	44.44	3.33	0.71
	11	14	0.00	14.29	21.43	64.29	3.50	0.76
	ALL	33	0.00	9.09	39.39	51.52	3.42	0.66
ALL	ALL	249	0.40	2.81	42.17	54.62	3.51	0.58

[1] Not Useful=1, Somewhat Useful=2, Useful=3, Very Useful=4

Table I.11

Question 4c – Check the column that most accurately reflects your opinion regarding the usefulness of the following materials: Item Separation Chart

Subject	Grade	Valid *N*	Percent Selecting Category: Not Useful	Somewhat Useful	Useful	Very Useful	Average[1]	*SD*
Reading	3	14	14.29	7.14	64.29	14.29	2.79	0.89
	4	19	10.53	21.05	47.37	21.05	2.79	0.92
	5	14	14.29	14.29	50.00	21.43	2.79	0.97
	6	11	0.00	18.18	54.55	27.27	3.09	0.70
	7	16	6.25	12.50	50.00	31.25	3.06	0.85
	8	20	5.00	15.00	35.00	45.00	3.20	0.89
	10	16	12.50	6.25	37.50	43.75	3.13	1.02
	11	19	0.00	5.26	57.89	36.84	3.32	0.58
	ALL	129	7.75	12.40	48.84	31.01	3.03	0.87
Mathematics	3	13	7.69	7.69	53.85	30.77	3.08	0.86
	4	13	0.00	15.38	61.54	23.08	3.08	0.64
	5	16	0.00	6.25	81.25	12.50	3.06	0.44
	6	9	11.11	0.00	55.56	33.33	3.11	0.93
	7	8	0.00	37.50	37.50	25.00	2.88	0.83
	8	12	0.00	25.00	41.67	33.33	3.08	0.79
	10	8	0.00	37.50	37.50	25.00	2.88	0.83
	11	8	0.00	0.00	75.00	25.00	3.25	0.46
	ALL	87	2.30	14.94	57.47	25.29	3.06	0.70
Science	5	9	11.11	22.22	55.56	11.11	2.67	0.87
	8	9	11.11	11.11	44.44	33.33	3.00	1.00
	11	14	14.29	35.71	28.57	21.43	2.57	1.02
	ALL	32	12.50	25.00	40.63	21.88	2.72	0.96
ALL	ALL	248	6.45	14.92	50.81	27.82	3.00	0.83

[1] Not Useful=1, Somewhat Useful=2, Useful=3, Very Useful=4

Table I.12

Question 4d – Check the column that most accurately reflects your opinion regarding the usefulness of the following materials: Item Information Sheet

Subject	Grade	Valid *N*	Percent Selecting Category: Not Useful	Somewhat Useful	Useful	Very Useful	Average[1]	*SD*
Reading	3	14	14.29	0.00	64.29	21.43	2.93	0.92
	4	19	5.26	10.53	63.16	21.05	3.00	0.75
	5	14	7.14	7.14	64.29	21.43	3.00	0.78
	6	11	0.00	18.18	45.45	36.36	3.18	0.75
	7	16	6.25	12.50	43.75	37.50	3.13	0.89
	8	20	5.00	5.00	35.00	55.00	3.40	0.82
	10	16	12.50	6.25	37.50	43.75	3.13	1.02
	11	19	0.00	5.26	57.89	36.84	3.32	0.58
	ALL	129	6.20	7.75	51.16	34.88	3.15	0.81
Mathematics	3	13	0.00	0.00	69.23	30.77	3.31	0.48
	4	13	0.00	15.38	61.54	23.08	3.08	0.64
	5	16	0.00	6.25	81.25	12.50	3.06	0.44
	6	9	0.00	0.00	33.33	66.67	3.67	0.50
	7	8	0.00	12.50	50.00	37.50	3.25	0.71
	8	12	0.00	8.33	41.67	50.00	3.42	0.67
	10	8	0.00	25.00	25.00	50.00	3.25	0.89
	11	8	0.00	0.00	75.00	25.00	3.25	0.46
	ALL	87	0.00	8.05	57.47	34.48	3.26	0.60
Science	5	9	0.00	11.11	66.67	22.22	3.11	0.60
	8	9	0.00	0.00	55.56	44.44	3.44	0.53
	11	14	7.14	28.57	42.86	21.43	2.79	0.89
	ALL	32	3.13	15.63	53.13	28.13	3.06	0.76
ALL	ALL	248	3.63	8.87	53.63	33.87	3.18	0.74

[1] Not Useful=1, Somewhat Useful=2, Useful=3, Very Useful=4

Table I.13

Question 4e – Check the column that most accurately reflects your opinion regarding the usefulness of the following materials: Person Separation Chart

Subject	Grade	Valid *N*	Percent Selecting Category: Not Useful	Somewhat Useful	Useful	Very Useful	Average[1]	*SD*
Reading	3	14	21.43	21.43	50.00	7.14	2.43	0.94
	4	19	21.05	21.05	47.37	10.53	2.47	0.96
	5	14	28.57	21.43	42.86	7.14	2.29	0.99
	6	11	18.18	18.18	36.36	27.27	2.73	1.10
	7	16	12.50	25.00	37.50	25.00	2.75	1.00
	8	20	15.00	10.00	45.00	30.00	2.90	1.02
	10	16	12.50	18.75	43.75	25.00	2.81	0.98
	11	19	10.53	26.32	42.11	21.05	2.74	0.93
	ALL	129	17.05	20.16	43.41	19.38	2.65	0.98
Mathematics	3	13	23.08	23.08	38.46	15.38	2.46	1.05
	4	13	23.08	23.08	46.15	7.69	2.38	0.96
	5	16	18.75	18.75	62.50	0.00	2.44	0.81
	6	9	22.22	11.11	55.56	11.11	2.56	1.01
	7	8	12.50	37.50	50.00	0.00	2.38	0.74
	8	12	0.00	33.33	41.67	25.00	2.92	0.79
	10	8	12.50	50.00	25.00	12.50	2.38	0.92
	11	8	0.00	12.50	75.00	12.50	3.00	0.53
	ALL	87	14.94	25.29	49.43	10.34	2.55	0.87
Science	5	8	50.00	12.50	37.50	0.00	1.88	0.99
	8	7	14.29	28.57	28.57	28.57	2.71	1.11
	11	14	57.14	28.57	14.29	0.00	1.57	0.76
	ALL	29	44.83	24.14	24.14	6.90	1.93	1.00
ALL	ALL	245	19.59	22.45	43.27	14.69	2.53	0.97

[1] Not Useful=1, Somewhat Useful=2, Useful=3, Very Useful=4

Table I.14
Question 4f – Check the column that most accurately reflects your opinion regarding the usefulness of the following materials: Student Score Distribution

Subject	Grade	Valid *N*	Percent Selecting Category: Not Useful	Somewhat Useful	Useful	Very Useful	Average[1]	*SD*
Reading	3	14	14.29	7.14	57.14	21.43	2.86	0.95
	4	18	0.00	22.22	61.11	16.67	2.94	0.64
	5	14	21.43	21.43	42.86	14.29	2.50	1.02
	6	11	0.00	18.18	54.55	27.27	3.09	0.70
	7	16	6.25	12.50	56.25	25.00	3.00	0.82
	8	20	5.00	5.00	50.00	40.00	3.25	0.79
	10	16	12.50	6.25	31.25	50.00	3.19	1.05
	11	19	10.53	15.79	52.63	21.05	2.84	0.90
	ALL	128	8.59	13.28	50.78	27.34	2.97	0.87
Mathematics	3	13	7.69	23.08	46.15	23.08	2.85	0.90
	4	13	7.69	38.46	46.15	7.69	2.54	0.78
	5	16	18.75	6.25	68.75	6.25	2.63	0.89
	6	9	11.11	11.11	55.56	22.22	2.89	0.93
	7	8	0.00	25.00	50.00	25.00	3.00	0.76
	8	12	0.00	16.67	50.00	33.33	3.17	0.72
	10	8	12.50	37.50	12.50	37.50	2.75	1.16
	11	8	0.00	12.50	62.50	25.00	3.13	0.64
	ALL	87	8.05	20.69	50.57	20.69	2.84	0.85
Science	5	9	11.11	22.22	55.56	11.11	2.67	0.87
	8	9	0.00	33.33	33.33	33.33	3.00	0.87
	11	14	28.57	35.71	35.71	0.00	2.07	0.83
	ALL	32	15.63	31.25	40.63	12.50	2.50	0.92
ALL	ALL	247	9.31	18.22	49.39	23.08	2.86	0.88

[1] Not Useful=1, Somewhat Useful=2, Useful=3, Very Useful=4

Table I.15

Question 4g – Check the column that most accurately reflects your opinion regarding the usefulness of the following materials: Statistical Impact Data

Subject	Grade	Valid *N*	Percent Selecting Category: Not Useful	Somewhat Useful	Useful	Very Useful	Average[1]	*SD*
Reading	**3**	14	7.14	7.14	64.29	21.43	3.00	0.78
	4	19	0.00	5.26	63.16	31.58	3.26	0.56
	5	14	0.00	21.43	42.86	35.71	3.14	0.77
	6	11	0.00	18.18	54.55	27.27	3.09	0.70
	7	16	0.00	6.25	68.75	25.00	3.19	0.54
	8	20	5.00	5.00	40.00	50.00	3.35	0.81
	10	16	6.25	0.00	43.75	50.00	3.38	0.81
	11	19	5.26	5.26	57.89	31.58	3.16	0.76
	ALL	129	3.10	7.75	54.26	34.88	3.21	0.71
Mathematics	**3**	13	7.69	15.38	46.15	30.77	3.00	0.91
	4	12	0.00	25.00	66.67	8.33	2.83	0.58
	5	16	6.25	12.50	68.75	12.50	2.88	0.72
	6	9	0.00	0.00	55.56	44.44	3.44	0.53
	7	8	0.00	0.00	50.00	50.00	3.50	0.53
	8	12	0.00	25.00	41.67	33.33	3.08	0.79
	10	8	0.00	50.00	12.50	37.50	2.88	0.99
	11	8	0.00	0.00	62.50	37.50	3.38	0.52
	ALL	86	2.33	16.28	52.33	29.07	3.08	0.74
Science	**5**	7	0.00	28.57	71.43	0.00	2.71	0.49
	8	8	12.50	25.00	25.00	37.50	2.88	1.13
	11	14	14.29	50.00	28.57	7.14	2.29	0.83
	ALL	29	10.34	37.93	37.93	13.79	2.55	0.87
ALL	**ALL**	244	3.69	14.34	51.64	30.33	3.09	0.77

[1] **Not Useful=1, Somewhat Useful=2, Useful=3, Very Useful=4**

Table I.16

Question 5a – Check the column that most accurately reflects your opinion regarding the amount of time allotted for your ratings: Round 1

Subject	Grade	Valid *N*	Percent Selecting Category: Too Little Time	About Right	Too Much Time	Average[1]	*SD*
Reading	3	13	0.00	92.31	7.69	2.08	0.28
	4	18	0.00	55.56	44.44	2.44	0.51
	5	17	0.00	100.00	0.00	2.00	0.00
	6	14	0.00	71.43	28.57	2.29	0.47
	7	15	13.33	40.00	46.67	2.33	0.72
	8	20	0.00	90.00	10.00	2.10	0.31
	10	14	28.57	64.29	7.14	1.79	0.58
	11	19	5.26	84.21	10.53	2.05	0.40
	ALL	130	5.38	75.38	19.23	2.14	0.48
Mathematics	3	12	0.00	91.67	8.33	2.08	0.29
	4	13	0.00	38.46	61.54	2.62	0.51
	5	15	0.00	100.00	0.00	2.00	0.00
	6	9	0.00	100.00	0.00	2.00	0.00
	7	9	0.00	88.89	11.11	2.11	0.33
	8	12	0.00	100.00	0.00	2.00	0.00
	10	8	0.00	75.00	25.00	2.25	0.46
	11	8	0.00	100.00	0.00	2.00	0.00
	ALL	86	0.00	86.05	13.95	2.14	0.35
Science	5	10	0.00	90.00	10.00	2.10	0.32
	8	9	0.00	66.67	33.33	2.33	0.50
	11	14	0.00	100.00	0.00	2.00	0.00
	ALL	33	0.00	87.88	12.12	2.12	0.33
ALL	ALL	249	2.81	80.72	16.47	2.14	0.42

[1] Too Little Time=1, About Right=2, Useful=3, Too Much Time=4

Table I.17

Question 5b – Check the column that most accurately reflects your opinion regarding the amount of time allotted for your ratings: Round 2

Subject	Grade	Valid *N*	Percent Selecting Category: Too Little Time	About Right	Too Much Time	Average[1]	*SD*
Reading	3	13	0.00	76.92	23.08	2.23	0.44
	4	18	0.00	33.33	66.67	2.67	0.49
	5	17	0.00	100.00	0.00	2.00	0.00
	6	14	0.00	64.29	35.71	2.36	0.50
	7	15	20.00	60.00	20.00	2.00	0.65
	8	20	10.00	85.00	5.00	1.95	0.39
	10	14	35.71	64.29	0.00	1.64	0.50
	11	19	10.53	89.47	0.00	1.89	0.32
	ALL	130	9.23	72.31	18.46	2.09	0.52
Mathematics	3	13	0.00	100.00	0.00	2.00	0.00
	4	11	0.00	54.55	45.45	2.45	0.52
	5	15	0.00	100.00	0.00	2.00	0.00
	6	9	0.00	88.89	11.11	2.11	0.33
	7	9	0.00	88.89	11.11	2.11	0.33
	8	12	0.00	100.00	0.00	2.00	0.00
	10	8	0.00	100.00	0.00	2.00	0.00
	11	8	0.00	100.00	0.00	2.00	0.00
	ALL	85	0.00	91.76	8.24	2.08	0.28
Science	5	10	0.00	80.00	20.00	2.20	0.42
	8	9	0.00	44.44	55.56	2.56	0.53
	11	14	0.00	92.86	7.14	2.07	0.27
	ALL	33	0.00	75.76	24.24	2.24	0.44
ALL	ALL	248	4.84	79.44	15.73	2.11	0.44

[1] Too Little Time=1, About Right=2, Useful=3, Too Much Time=4

Table I.18

Question 5c – Check the column that most accurately reflects your opinion regarding the amount of time allotted for your ratings: Round 3

Subject	Grade	Valid *N*	Percent Selecting Category: Too Little Time	About Right	Too Much Time	Average[1]	*SD*
Reading	3	13	0.00	61.54	38.46	2.38	0.51
	4	18	0.00	55.56	44.44	2.44	0.51
	5	17	0.00	100.00	0.00	2.00	0.00
	6	14	0.00	57.14	42.86	2.43	0.51
	7	15	20.00	53.33	26.67	2.07	0.70
	8	20	0.00	90.00	10.00	2.10	0.31
	10	14	0.00	92.86	7.14	2.07	0.27
	11	19	0.00	89.47	10.53	2.11	0.32
	ALL	130	2.31	76.15	21.54	2.19	0.45
Mathematics	3	12	0.00	100.00	0.00	2.00	0.00
	4	11	0.00	100.00	0.00	2.00	0.00
	5	16	18.75	81.25	0.00	1.81	0.40
	6	9	0.00	100.00	0.00	2.00	0.00
	7	9	0.00	100.00	0.00	2.00	0.00
	8	12	0.00	100.00	0.00	2.00	0.00
	10	8	25.00	75.00	0.00	1.75	0.46
	11	8	0.00	100.00	0.00	2.00	0.00
	ALL	85	5.88	94.12	0.00	1.94	0.24
Science	5	10	0.00	100.00	0.00	2.00	0.00
	8	8	62.50	12.50	25.00	1.63	0.92
	11	12	41.67	41.67	16.67	1.75	0.75
	ALL	30	33.33	53.33	13.33	1.80	0.66
ALL	ALL	245	7.35	79.59	13.06	2.06	0.45

[1] Too Little Time=1, About Right=2, Useful=3, Too Much Time=4

Table I.19

Question 6a – Check the column that most accurately reflects your satisfaction with the following roles: DRC Psychometric Lead

Subject	Grade[1]	Valid *N*	Percent Selecting Category: Not Satisfied	Somewhat Satisfied	Satisfied	Very Satisfied	Average[2]	*SD*
Reading	4	17	0.00	17.65	58.82	23.53	3.06	0.66
	7	16	0.00	18.75	43.75	37.50	3.19	0.75
	10	14	7.14	14.29	57.14	21.43	2.93	0.83
	ALL	47	2.13	17.02	53.19	27.66	3.06	0.73
Mathematics	4	13	0.00	15.38	76.92	7.69	2.92	0.49
	7	9	0.00	0.00	33.33	66.67	3.67	0.50
	10	8	0.00	12.50	62.50	25.00	3.13	0.64
	ALL	30	0.00	10.00	60.00	30.00	3.20	0.61
Science	5	10	0.00	0.00	70.00	30.00	3.30	0.48
	8	8	0.00	0.00	87.50	12.50	3.13	0.35
	11	12	8.33	25.00	66.67	0.00	2.58	0.67
	ALL	30	3.33	10.00	73.33	13.33	2.97	0.61
ALL	ALL	107	1.87	13.08	60.75	24.30	3.07	0.67

[1] Only grades that immediately followed training are included.

[2] Not Satisfied=1, Somewhat Satisfied=2, Satisfied=3, Very Satisfied=4

Table I.20

Question 6b – Check the column that most accurately reflects your satisfaction with the following roles: DRC Room Facilitator

Subject	Grade	Valid *N*	Percent Selecting Category: Not Satisfied	Somewhat Satisfied	Satisfied	Very Satisfied	Average[1]	*SD*
Reading	3	12	0.00	8.33	41.67	50.00	3.42	0.67
	4	18	0.00	5.56	55.56	38.89	3.33	0.59
	5	15	0.00	6.67	46.67	46.67	3.40	0.63
	6	12	0.00	8.33	50.00	41.67	3.33	0.65
	7	16	0.00	6.25	43.75	50.00	3.44	0.63
	8	19	0.00	0.00	47.37	52.63	3.53	0.51
	10	14	0.00	7.14	28.57	64.29	3.57	0.65
	11	19	0.00	0.00	52.63	47.37	3.47	0.51
	ALL	125	0.00	4.80	46.40	48.80	3.44	0.59
Mathematics	3	13	0.00	0.00	38.46	61.54	3.62	0.51
	4	13	0.00	0.00	30.77	69.23	3.69	0.48
	5	16	6.25	18.75	56.25	18.75	2.88	0.81
	6	9	0.00	0.00	33.33	66.67	3.67	0.50
	7	9	0.00	0.00	33.33	66.67	3.67	0.50
	8	11	0.00	0.00	36.36	63.64	3.64	0.50
	10	8	0.00	0.00	37.50	62.50	3.63	0.52
	11	8	0.00	0.00	25.00	75.00	3.75	0.46
	ALL	87	1.15	3.45	37.93	57.47	3.52	0.63
Science	5	10	0.00	0.00	70.00	30.00	3.30	0.48
	8	9	22.22	11.11	55.56	11.11	2.56	1.01
	11	14	21.43	42.86	35.71	0.00	2.14	0.77
	ALL	33	15.15	21.21	51.52	12.12	2.61	0.90
ALL	ALL	245	2.45	6.53	44.08	46.94	3.36	0.71

[1] Not Satisfied=1, Somewhat Satisfied=2, Satisfied=3, Very Satisfied=4

Table I.21
Question 6c – Check the column that most accurately reflects your satisfaction with the following roles: Other DRC Staff

Subject	Grade	Valid *N*	Percent Selecting Category: Not Satisfied	Somewhat Satisfied	Satisfied	Very Satisfied	Average[1]	*SD*
Reading	3	9	0.00	11.11	55.56	33.33	3.22	0.67
	4	16	0.00	12.50	62.50	25.00	3.13	0.62
	5	13	0.00	0.00	61.54	38.46	3.38	0.51
	6	10	10.00	10.00	60.00	20.00	2.90	0.88
	7	16	18.75	6.25	68.75	6.25	2.63	0.89
	8	20	0.00	5.00	55.00	40.00	3.35	0.59
	10	14	0.00	7.14	64.29	28.57	3.21	0.58
	11	19	0.00	5.26	73.68	21.05	3.16	0.50
	ALL	117	3.42	6.84	63.25	26.50	3.13	0.68
Mathematics	3	13	0.00	0.00	76.92	23.08	3.23	0.44
	4	13	0.00	0.00	76.92	23.08	3.23	0.44
	5	15	6.67	20.00	53.33	20.00	2.87	0.83
	6	9	0.00	0.00	44.44	55.56	3.56	0.53
	7	9	0.00	0.00	55.56	44.44	3.44	0.53
	8	10	0.00	0.00	70.00	30.00	3.30	0.48
	10	7	0.00	0.00	71.43	28.57	3.29	0.49
	11	7	0.00	0.00	85.71	14.29	3.14	0.38
	ALL	83	1.20	3.61	66.27	28.92	3.23	0.57
Science	5	9	0.00	0.00	77.78	22.22	3.22	0.44
	8	8	0.00	0.00	87.50	12.50	3.13	0.35
	11	11	9.09	45.45	45.45	0.00	2.36	0.67
	ALL	28	3.57	17.86	67.86	10.71	2.86	0.65
ALL	ALL	228	2.63	7.02	64.91	25.44	3.13	0.64

[1] Not Satisfied=1, Somewhat Satisfied=2, Satisfied=3, Very Satisfied=4

Table I.22

Question 7a – Check the column that most accurately reflects the level of confidence you had in determining the location for each assessment cut-point: Not Proficient/Proficient

Subject	Grade	Valid *N*	Percent Selecting Category: Not Confident	Partially Confident	Confident	Very Confident	Average[1]	*SD*
Reading	3	13	0.00	15.38	46.15	38.46	3.23	0.73
	4	18	5.56	11.11	50.00	33.33	3.11	0.83
	5	17	0.00	5.88	41.18	52.94	3.47	0.62
	6	15	0.00	6.67	73.33	20.00	3.13	0.52
	7	16	0.00	31.25	56.25	12.50	2.81	0.66
	8	20	5.00	15.00	45.00	35.00	3.10	0.85
	10	14	0.00	7.14	85.71	7.14	3.00	0.39
	11	19	5.26	5.26	36.84	52.63	3.37	0.83
	ALL	132	2.27	12.12	53.03	32.58	3.16	0.72
Mathematics	3	13	0.00	7.69	76.92	15.38	3.08	0.49
	4	13	0.00	23.08	53.85	23.08	3.00	0.71
	5	16	0.00	37.50	50.00	12.50	2.75	0.68
	6	9	0.00	11.11	55.56	33.33	3.22	0.67
	7	9	0.00	11.11	55.56	33.33	3.22	0.67
	8	12	0.00	33.33	41.67	25.00	2.92	0.79
	10	8	12.50	37.50	37.50	12.50	2.50	0.93
	11	8	12.50	12.50	50.00	25.00	2.88	0.99
	ALL	88	2.27	22.73	53.41	21.59	2.94	0.73
Science	5	10	0.00	20.00	50.00	30.00	3.10	0.74
	8	9	11.11	0.00	77.78	11.11	2.89	0.78
	11	14	28.57	57.14	14.29	0.00	1.86	0.66
	ALL	33	15.15	30.30	42.42	12.12	2.52	0.91
ALL	ALL	253	3.95	18.18	51.78	26.09	3.00	0.78

[1] Not Confident=1, Partially Confident=2, Confident=3, Very Confident=4

Table I.23

Question 7b – Check the column that most accurately reflects the level of confidence you had in determining the location for each assessment cut-point: Proficient/Advanced

Subject	Grade	Valid *N*	Percent Selecting Category: Not Confident	Partially Confident	Confident	Very Confident	Average[1]	*SD*
Reading	3	12	0.00	8.33	50.00	41.67	3.33	0.65
	4	18	0.00	11.11	55.56	33.33	3.22	0.65
	5	17	0.00	0.00	35.29	64.71	3.65	0.49
	6	15	0.00	0.00	80.00	20.00	3.20	0.41
	7	16	6.25	18.75	62.50	12.50	2.81	0.75
	8	20	0.00	5.00	60.00	35.00	3.30	0.57
	10	14	0.00	0.00	42.86	57.14	3.57	0.51
	11	19	5.26	5.26	31.58	57.89	3.42	0.84
	ALL	131	1.53	6.11	51.91	40.46	3.31	0.66
Mathematics	3	13	0.00	7.69	76.92	15.38	3.08	0.49
	4	13	0.00	15.38	53.85	30.77	3.15	0.69
	5	16	0.00	31.25	50.00	18.75	2.88	0.72
	6	9	0.00	11.11	55.56	33.33	3.22	0.67
	7	9	0.00	11.11	55.56	33.33	3.22	0.67
	8	11	0.00	18.18	45.45	36.36	3.18	0.75
	10	7	0.00	57.14	28.57	14.29	2.57	0.79
	11	8	12.50	12.50	37.50	37.50	3.00	1.07
	ALL	86	1.16	19.77	52.33	26.74	3.05	0.72
Science	5	10	0.00	10.00	70.00	20.00	3.10	0.57
	8	9	11.11	0.00	77.78	11.11	2.89	0.78
	11	14	21.43	35.71	42.86	0.00	2.21	0.80
	ALL	33	12.12	18.18	60.61	9.09	2.67	0.82
ALL	ALL	250	2.80	12.40	53.20	31.60	3.14	0.73

[1] Not Confident=1, Partially Confident=2, Confident=3, Very Confident=4

Table I.24
Question 8 – How confident are you that the processes and methods used will produce valid results?

Subject	Grade	Valid *N*	Percent Selecting Category: Not Confident	Somewhat Confident	Confident	Very Confident	Average[1]	*SD*
Reading	3	12	0.00	16.67	58.33	25.00	3.08	0.67
	4	18	5.56	11.11	72.22	11.11	2.89	0.68
	5	17	0.00	17.65	52.94	29.41	3.12	0.70
	6	15	13.33	13.33	46.67	26.67	2.87	0.99
	7	16	6.25	25.00	62.50	6.25	2.69	0.70
	8	20	5.00	15.00	60.00	20.00	2.95	0.76
	10	14	0.00	35.71	57.14	7.14	2.71	0.61
	11	19	0.00	10.53	57.89	31.58	3.21	0.63
	ALL	131	3.82	17.56	58.78	19.85	2.95	0.73
Mathematics	3	13	0.00	7.69	76.92	15.38	3.08	0.49
	4	13	0.00	23.08	69.23	7.69	2.85	0.55
	5	16	6.25	43.75	50.00	0.00	2.44	0.63
	6	9	0.00	22.22	44.44	33.33	3.11	0.78
	7	9	0.00	11.11	77.78	11.11	3.00	0.50
	8	11	0.00	18.18	45.45	36.36	3.18	0.75
	10	8	0.00	62.50	37.50	0.00	2.38	0.52
	11	8	0.00	37.50	50.00	12.50	2.75	0.71
	ALL	87	1.15	27.59	57.47	13.79	2.84	0.66
Science	5	10	10.00	20.00	70.00	0.00	2.60	0.70
	8	8	12.50	25.00	62.50	0.00	2.50	0.76
	11	14	42.86	28.57	28.57	0.00	1.86	0.86
	ALL	32	25.00	25.00	50.00	0.00	2.25	0.84
ALL	ALL	250	5.60	22.00	57.20	15.20	2.82	0.75

[1] Not Confident=1, Somewhat Confident=2, Confident=3, Very Confident=4

DATA RECOGNITION

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