2011 NeSA-Mathematics Standard Setting Technical Report

June 27-29, 2011

Prepared by
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1. Executive Summary

Academic Performance Levels for the mathematics component of the Nebraska State Accountability assessments (NeSA-Mathematics) were developed in spring 2011 by establishing cut scores that define operationally the three Performance Levels: *Below the Standards, Meets the Standards, Exceeds the Standards*. These Performance Level designations will be used by local, state, and federal accountability programs and are central to communicating to parents, teachers and the public. The *Meets the Standards* and *Exceeds the Standards* levels are used for the *No Child Left Behind (NCLB)* Adequate Yearly Progress (AYP) proficiency goal.

The larger process comprised four events. First, a meeting was held February 28, 2011, with the Nebraska State Board of Education and other stakeholders to introduce the process and obtain feedback to ensure an effective, defensible process. Second, a *Contrasting Groups* survey of mathematics specialists and teachers was conducted in spring 2011 to obtain the teachers' overall perception of the proficiency level of their own students, independent of the state assessment. Third, a *Bookmark* Standard Setting was conducted June 27–29, 2011 in Lincoln, Nebraska, after the operational data were available. Finally, recommendations of the Contrasting Groups and Bookmark processes were presented to the State Board of Education July 12–13, 2011. The purpose of this meeting was for the State Board of Education to formally establish the Performance Levels. This report specifically documents the Bookmark and Contrasting Groups portions of the process.

The Bookmark method (*Lewis, Mitzel, & Green, 1996*) is, perhaps, the most philosophically consistent with criterion-referenced, standards-based[1] assessments like the NeSA. Bookmark is an *item-based* method. It requires panelists to determine which items can be successfully answered 67% of the time by students at the Performance Level boundaries. The Contrasting Groups method (*Cizek & Bunch, 2007, chapter 8*) is *student-based* which asks teachers to place students into one of the three Performance Levels based on their knowledge of the students from their classrooms without considering the assessment. The success of either approach requires an in-depth understanding of the skills and knowledge required at each level. This shared understanding is expressed in *Performance Level Descriptors* (Appendix A).

To assist the State Board of Education in determining appropriate cut scores, DRC presented the results of both studies, the Bookmark and the Contrasting Groups. A composite of the two studies was also considered. An analytical smoothing of the results was done to provide a coherent representation of the data across grades that, overall, did not raise or lower the panel recommendations. Ultimately, the State Board of Education approved cut scores that were above the recommendations but within one standard error of measurement from the smoothed values.

[1] The term *standard* is used in two different senses in this area. *Content standards* are written descriptions of the goals and expectations for learning and instruction at each grade level. *Performance standard*s, which are the focus of this report, define the levels of achievement necessary for each Performance Level. In some contexts, the term *performance standard* is interchangeable with *cut score*.

Board-Approved Cut Scores

The final State Board of Education approved cut scores and the percentage of spring 2011 students expected to be in each Performance Level are shown in Table 1.1.1. These values in the scale score metric will be used for all grades and will not change from year to year. The *Raw Score Ranges* may vary from year to year, depending on the difficulty of the specific form, and the *Percent in Each Performance Level* will vary, depending on the proficiency of the students at that time.

Table 1.1.1 State Board of Education Approved Standard Setting Results

	Scale Score Ranges by Performance Level			2011 Raw Score Ranges by Performance Level			Logit Cut Points		2011 Percent in Each Performance Level		
Grade	Below	Meets	Exceeds	Below	Meets	Exceeds	B/M	M/E	Below	Meets	Exceeds
3	1 to 84	85-134	135 to 200	1 to 33	34 to 45	46 to 50	-0.6000	1.1000	32.7	49.8	17.5
4	1 to 84	85-134	135 to 200	1 to 37	38 to 50	51 to 55	-0.6000	1.2000	32.4	51.7	15.9
5	1 to 84	85-134	135 to 200	1 to 37	38 to 50	51 to 55	-0.5700	1.1597	34.1	48.2	17.7
6	1 to 84	85-134	135 to 200	1 to 41	42 to 53	54 to 58	-0.4700	1.1816	37.3	44.3	18.4
7	1 to 84	85-134	135 to 200	1 to 38	39 to 52	53 to 58	-0.4500	1.2500	38.5	45.3	16.2
8	1 to 84	85-134	135 to 200	1 to 41	42 to 55	56 to 60	-0.4000	1.3000	39.5	44.5	16.0
11	1 to 84	85-134	135 to 200	1 to 37	38 to 51	52 to 60	-0.2900	1.1000	46.0	32.8	21.2

Cut scores are defined in a logit metric, which, like scale scores, are also fixed. Logits are related to percentage correct scores but are preferred because they are not tied to a specific test form and will not change from year to year. This ensures a consistent definition of the Performance Levels even if different test forms vary in difficulty. For reporting purposes, logits are converted into the scale scores, which is mathematically equivalent but more user-friendly.

The meaning of the logit and scale score values will not change in the future, but the raw score ranges may shift slightly to reflect the variation in item and form difficulty; a more difficult form will require fewer correct responses and an easier form will require more. With a stable scale score cut point, changes in the percentage of students in each proficiency level will reflect changes in student proficiency and not changes in form difficulty.

2. Introduction

2.1 Background

In January 2009, the Nebraska Department of Education contracted with Data Recognition Corporation (DRC) to provide and operate a computerized information system to support the administration, record keeping, and reporting for statewide student assessment and accountability under the direction of the Department of Education.

NeSA Content Areas and Grade Levels: Legislative Bill (LB) 1157 (http://uniweb.legislature.ne.gov/FloorDocs/Current/PDF/Slip/LB1157.pdf) passed by the 2008 Nebraska Legislature requires a single statewide assessment of the Nebraska academic content standards for writing, reading, mathematics, and science in Nebraska's K-12 public schools. The new assessment system is named NeSA (Nebraska State Accountability) with NeSA-Reading for reading assessments and NeSA-Mathematics for mathematics. The NeSA-Mathematics assessments were administered operationally in grades 3 through 8 and 11 for the first time in the spring of 2011.

Phase-In Schedule for NeSA: The Nebraska Department of Education prescribed the assessments starting in the 2009-2010 school year to be phased in as shown in Table 2.1.1. The state used the expertise and experience of in-state educators to participate in the design and development of the new statewide assessment system. The Nebraska Department of Education developed the NeSA-Reading and NeSA-Mathematics tests for use in the state accountability system and was charged with setting student academic Performance Level standards on the NeSA-Reading and NeSA-Mathematics tests.

Table 2.1.1: NeSA Administration Schedule

Content Area	Administration Year		Grades
	Field Test	Operational	
Reading	2009	2010	3 through 8 and one high school grade
Mathematics	2010	2011	3 through 8 and one high school grade
Science	2011	2012	Elementary, middle/junior high, high school

The Nebraska Department of Education required standard-setting procedures to determine student academic Performance Levels for the NeSA-Reading and NeSA-Mathematics assessments administered to each of grades 3 through 8 and 11. DRC, with the assistance of the Nebraska Department of Education, organized and facilitated the Standard Setting events.

For NeSA-Reading and NeSA-Mathematics, there are three student Performance Levels: *Below the Standards, Meets the Standards,* and *Exceeds the Standards*, requiring two cut points. For federal reporting purposes, *Proficiency* is defined as students performing at *Meets the Standards* and *Exceeds the Standards* levels.

2.2 Purpose and Objectives of NeSA and Standard Setting

NeSA tests measure student performance on the State-adopted academic standards to:

1. promote student learning,
2. identify areas in which students, schools, or school districts need additional support;
3. indicate the academic achievement for schools, districts, and the State;
4. satisfy federal reporting requirements; and
5. provide professional development to educators.

The results from the NeSA-Mathematics tests were used for determining *Adequate Yearly Progress* (AYP) for *No Child Left Behind* (NCLB) and for reporting annual State school and district ratings of end-of-year performance.

Many Standard Setting methods have been proposed. These fall into two major approaches:

1. *Item-based*, which focus on what knowledge, skills, and behaviors are required to successfully respond to an item, and
2. *Student-based*, which focus on what proficiencies individual students possess.

For the NeSA, both approaches were used.

2.3 Bookmark Standard Setting Method

DRC followed a Bookmark procedure similar to the method suggested by Lewis, Mitzel, and Green (1996). Bookmark is one in a broad category of methods commonly referred to as item mapping, which focus on items rather than examinees. The essential task is to identify the items that can be answered successfully (67% likelihood) by students at the boundaries of the Performance Levels. The logit difficulty value that separates the items that borderline students can do from those they cannot do, establishes the Bookmark cut score.

All panelists were trained in a large group prior to breaking into smaller working groups. Training covered the following points:

- The Performance Levels are defined and described by the Performance Level Descriptors developed by the state with advice for Nebraska teachers and other content specialists.
- The task for the panelist is to place a bookmark between items that students at the threshold of a Performance Level have mastered and those not yet mastered.
- Students at a given cut score will have a 0.67 probability of correctly responding to a multiple-choice item at the cut score. These students will have a higher probability of success on easier items (before the bookmark) and a lower probability of success on harder items (after the bookmark).
- In placing their bookmarks, the task was to consider what students *should* know and be able to do as defined by the Performance Level Descriptors and the item content.

- Panelists were instructed to first place the bookmark separating Below the Standards from Meets the Standards levels and then place the bookmark separating Meets the Standards from Exceeds the Standards.
- Panelists were asked to record their bookmark placements on a rating form. The placements were entered into a spreadsheet program, and the median cut score was calculated for the full panel.

To begin the process, participants were asked to visualize the knowledge and skills of a student who is at the borderline between two Performance Levels based on the Performance Level Descriptors. Participants were given an Ordered Item Booklet with items ordered from least to most difficult. Panelists were also provided with supporting materials for each item including the correct response, content objective, and item sequence in the test booklets.

The task for the panelist was to proceed through the Ordered Item Booklet and ask, for each item, if the borderline student could answer correctly. Each panelist placed a bookmark in front of the page in the booklet where the borderline student had not mastered the item. *Mastery* was defined as having at least a 67% likelihood of responding correctly.

The DRC adaptation of the Bookmark procedure involved three rounds of deliberation, discussion, and feedback. These iterations are described in more detail in Section 4.

2.4 Contrasting Groups Standard Setting Method

The examinee-based Contrasting Groups (Cizek & Bunch, 2007) survey was included to complement the item-based Bookmark method. The survey asked the teachers to evaluate each student with whom they were familiar and indicate which Performance Level best described the student. The survey was conducted prior to the first operational administration of the NeSA-Mathematics, so ratings would be determined by the teachers' firsthand experience with the students in the classroom, not their performance on the test. All mathematics teachers and specialists in Nebraska were invited to participate in the survey.

The survey was distributed online. Teachers first selected students from a roster for their own school excluding students for whom they were unfamiliar or uncertain. The instructions emphasized the importance of knowing the student and the student's status. Teachers were encouraged to omit ratings for any student for whom the teacher did not have firsthand knowledge.

The results of the survey were summarized, provided to the Bookmark panels after the initial round, and presented to State Board of Education as part of the final cut score recommendations.

2.5 Meetings with a Committee of Stakeholders and State Board of Education

DRC presented to a subgroup of Board Committee members, media and other stakeholders on February 28, 2011. The February meeting introduced the process to the stakeholders to familiarize them with the Standard Setting process and obtain their reactions. DRC presented an overview of the Standard Setting procedures and outlined the appropriate interpretation of the

results from the studies. There was discussion of the information needed and effective methods for its interpretation.

The purpose of the July meeting of the State Board of Education was to formally adopt a motion establishing proficiency level cut scores for the NeSA-Mathematics based on results from the two Standard Setting events and on recommendations from the Nebraska Department of Education.

3. Preparation for Standard Setting

In April 2011, a Bookmark Standard Setting plan proposed by DRC was reviewed and approved by the Nebraska Department of Education and its Technical Advisory Committee. The plan described the purpose of the meeting, specifications of panelists, methodology, and potential consequences related to accountability. This section provides an overview from the plan.

3.1 Bookmark Panelist Recruitment

The Nebraska Department of Education recruited panelists for the Standard Setting process:

- In January of 2011, Dr. Pat Roschewski communicated with District Assessment Contacts, informing them of the plan for establishing NeSA-Mathematics cut scores and the need for Nebraska educators to participate in the process.
- Information regarding the Standard Setting process was communicated to Nebraska districts in *Standards, Assessment, and Accountability Updates*.
- The Statewide Assessment Office sought nominations for participation in the Standard Setting process.
- Statewide Assessment Office members reviewed the nominations and selected participants. Three criteria were considered:
    1. Educational role.
    2. Geographic location.
    3. Knowledge and experience with the NeSA-Mathematics.
- Applicants were notified by the Statewide Assessment Office of their selection status.

A total of 90 panelists participated in the Bookmark event. Table 3.1.1 summarizes information about characteristics of the participating panelists based on their self-reported responses to the Participant Survey. Most panelists were classroom teachers; a few were non-teacher educators, and the majority was female.

Table 3.1.1 Panelist Summary

Demographic		Mathematics
Grade Group - as teacher reported	3	3
	4	5
	5	3
	6	4
	7	1
	8	6
	3,4,5	21
	3,4,5,6	3
	3,5,6	1
	5,6	1
	6,7,8	22
	7, HS	1
	HE	3
	HS	13
	Multiple grades/ESL	1
	Multiple grades /SPED	2
Gender	Male	11
	Female	79
Ethnicity	White/non-Hispanic	89
	American Indian	1
Role	Other	4
	Teacher	77
	Educator	9
Region	Rural	23
	Urban	39
	Suburban	19
Experience	0 - 5 years	7
	6 - 10 years	14
	11 - 15 years	20
	16 – 20 years	13
	21 – 25 years	12
	26 – 30 years	12
	31 – 35 years	8
	> 36 years	4

3.2 Roles and Responsibilities

A successful Standard Setting requires the concerted and coordinated efforts of many people including staff from the Nebraska Department of Education and DRC, and, most importantly, the panelists. Each group has its unique and critical roles and responsibilities:

Panelists—brought their individual educational experience and expertise about Nebraska students, mathematics instruction, and the Nebraska curriculum. Their knowledge of mathematics instruction and curriculum in Nebraska and their familiarity with Nebraska students forms the foundation for the validity of the performance standards.

Nebraska Department of Education— The Nebraska Department of Education staff convened the meeting and introduced the NeSA-Mathematics program and the importance of Standard Setting. The Nebraska Department of Education staff monitored the progress of each panel and fielded questions on the assessment and test content and on any policy concerns.

DRC Staff—facilitated the sessions and provided logistical and technical support.

Psychometric Lead—conducted the training session and monitored progress and results throughout.

Test Development Specialist—assisted as needed with the Performance Levels and covered questions about test content.

Project Management—maintained security of materials through check-in and check-out procedures, liaison with hotel facility staff, and overall coordination of meeting logistics.

Room Facilitators—reviewed procedures for the panelists, kept the process moving on schedule, explained results, and facilitated the sessions.

Statistical Analyst—entered the panelists' bookmark ratings and performed the necessary statistical analyses.

3.3 Materials Preparation

Workshop materials were prepared by DRC. The materials available to panelists during the workshop included:

- Training Materials
- Operational Test Forms
- Ordered Item Booklet
- Performance Level Descriptors
- Item Map
- Item Separation Map
- Participant Rating Forms

Training materials comprised a much reduced test and related materials that were otherwise identical to the materials to be used in the actual process. The training materials were based on released items and item data from the Nebraska item bank.

Mathematics Performance Level Descriptors were originally developed by the Nebraska Department of Education with assistance from educators. A complete statement of the Performance Level Descriptors is included in Appendix A.

3.4 Ordered Item Booklet

The critical information was in the Ordered Item Booklet. Each Ordered Item Booklet contained all items in the grade in order of item difficulty from least to most difficult, based on item difficulties obtained from the spring 2011 NeSA-Mathematics administration. Table 3.5.1 displays the number of items/score points per grade on the operational forms. Item Separation Charts for each grade are included in Appendix E.

Table 3.4.1: Number of Score Points in Ordered Item Booklet

Content	Grade	No. of Score Points in the OIB
Mathematics	**3**	50
	4	55
	5	55
	6	58
	7	58
	8	60
	11	60

The task presented to the panelists was to identify the item in the Ordered Item Booklet for which the student on the boundary between two Performance Levels can no longer answer the item correctly with reasonable certainty. The required level of mastery was defined operationally as a probability of success of 0.67. With the Rasch model, the choice of the mastery level does not affect the ordering of the items, but it does affect which scale score aligns with the bookmarked item.

The Rasch model for dichotomous items (Wright & Stone, 1979) defines the probability of success as:

1. $p = \frac{e^{b-d}}{1+e^{b-d}}$.

With a little algebra, p = 0.67 implies the logit cut score is shifted by *0.69 logits* from the logit difficulty of the bookmarked item:

2. $(b-d) = ln\frac{0.67}{1-0.67} = ln(2) = 0.69$.

4. Standard Setting Procedures

4.1 Contrasting Groups

An examinee-based Contrasting Groups survey was included to complement the item-based Bookmark method. All Nebraska mathematics teachers were invited to participate in the survey, which was presented online. The task for the teachers was to evaluate each student with whom the teacher was familiar and indicate the Performance Level that best described the student. The survey was conducted prior to the first operational administration of the NeSA-Mathematics, so ratings were determined by the teachers' firsthand experience with the students in the classroom, not their performance on the test. The Performance Levels were defined by the Performance Level Descriptors, which were available online for review at any point in the process.

The teachers had the opportunity to select students from their own classes and schools and to exclude any students. The instructions emphasized the importance of knowing the student and the student's status. Teachers were encouraged to omit ratings for any students for whom they did not have firsthand knowledge.

Recruitment: In January 2011, the Nebraska Department of Education and DRC contacted Nebraska District Assessment Coordinators (DAC) to solicit their cooperation in the study that would bring teachers' knowledge of mathematics instruction and an understanding of their students together. The DAC were first asked to provide contacts for these mathematics teachers and specialists.

In early February 2011, DRC sent an initial invitation to teachers. This invitation asked for their participation in an online study that would use their professional judgment to help establish the Performance Levels for the NeSA-Mathematics. The intent was that participating in the survey would take less than 30 minutes and that all responses were confidential. Potential participants were also given the schedule for the survey and the training sessions.

A follow-up email with the online conferences (via WebEx™) dates, sign-on and times, and information about DRC's online delivery system was sent to the participating teachers on March 1, 2011.

Training: DRC hosted ten online conferences to introduce teachers to the online Contrasting Groups survey. The online conferences were interactive, allowing teachers to pose questions and seek immediate clarification. Typically, the sessions lasted fifteen to twenty minutes. Feedback on the training was positive. For teachers who were unable to attend a online conferences session, the Nebraska Department of Education placed the training materials on its website on March 16, 2011.

The training covered the details of navigating the survey website, saving the work, returning after interruptions, and submitting the ratings. Each teacher was asked to:

- Use the school and district rosters provided to create a personal class roster with 25-30 students representing all Performance Levels.

- Follow the instructions repeated at the top of each page of the survey.
- Read and refer back to the Performance Level Descriptors in the course of the survey.
- Complete the survey as soon as possible after training, but no later than March 25, 2011.

Table 4.1.1: Online Conference Training Schedule

SESSION	DATE	TIME
1	Wednesday, March 9, 2011	7:00 – 7:30 AM
2	Wednesday, March 9, 2011	3:30 – 4:00 PM
3	Thursday, March 10, 2011	9:00 – 9:30 AM
4	Thursday, March 10, 2011	4:00 – 4:30 PM
5	Friday, March 11, 2011	11:00 – 11:30 AM
6	Friday, March 11, 2011	1:00 – 1:30 PM
7	Monday, March 14, 2011	2:30 – 3:00 AM
8	Monday, March 14, 2011	3:30 – 4:00 PM
9	Tuesday, March 15, 2011	3:00 – 3:30 PM
10	Tuesday, March 15, 2011	4:00 – 4:30 PM

The instructions reminded teachers that they should not include students with whom they had little experience, nor did they need to rate students, even if selected, if they were uncomfortable assigning the student to a Performance Level for any reason.

Survey Results:

A total of 562 teachers participated in the survey. The distribution across grades ranged between a high of 110 for grade 11 and a low of 64 for grades 6 and 8. The initial target number was 100 per grade. Feedback from the participants indicated the task was easier and took less time than they expected. A brief survey soliciting teachers' opinions on the Contrasting Groups task was requested and results are presented in Appendix J. The participation breakdown by grade is given in Table 4.1.2.

Table 4.1.2: Contrasting Groups Participation by Grade

Grade	Number of Teachers	Number of Students Rated
3	75	1398
4	108	2072
5	76	1702
6	64	2403
7	65	2867
8	64	2656
11	110	3128
Total	**562**	**16226**

Appendix F provides detailed summaries of the survey, including breakouts by gender, ethnic group, English language learners (ELL), and free lunch status (FLS). The tables also show the agreement between the teacher ratings and the Performance Level assignments using the final, State Board of Education-approved cut scores. The correlations between the teachers' assessments and the operational test placements were about 0.6 or higher across grades.

Two pieces of data were available about students who had been rated on the Contrasting Groups survey: first, the Performance Level assigned by the teacher and second, the observed number

correct on the NeSA-Mathematics. While the agreement was far from perfect, there was a strong relationship: students with a low number correct tended to be placed in the Below the Standards level and students with high number correct scores in the Exceeds the Standards level. This is illustrated in Table 4.1.3. For example, with smoothed counts of 16 and 13 for Below the Standards and Meets the Standards respectively at a number correct score of 31, the odds of a student with the score being in the Meets the Standards level is 13 / 16 = 0.81. Consequently, this score is tentatively classified as Below the Standards.

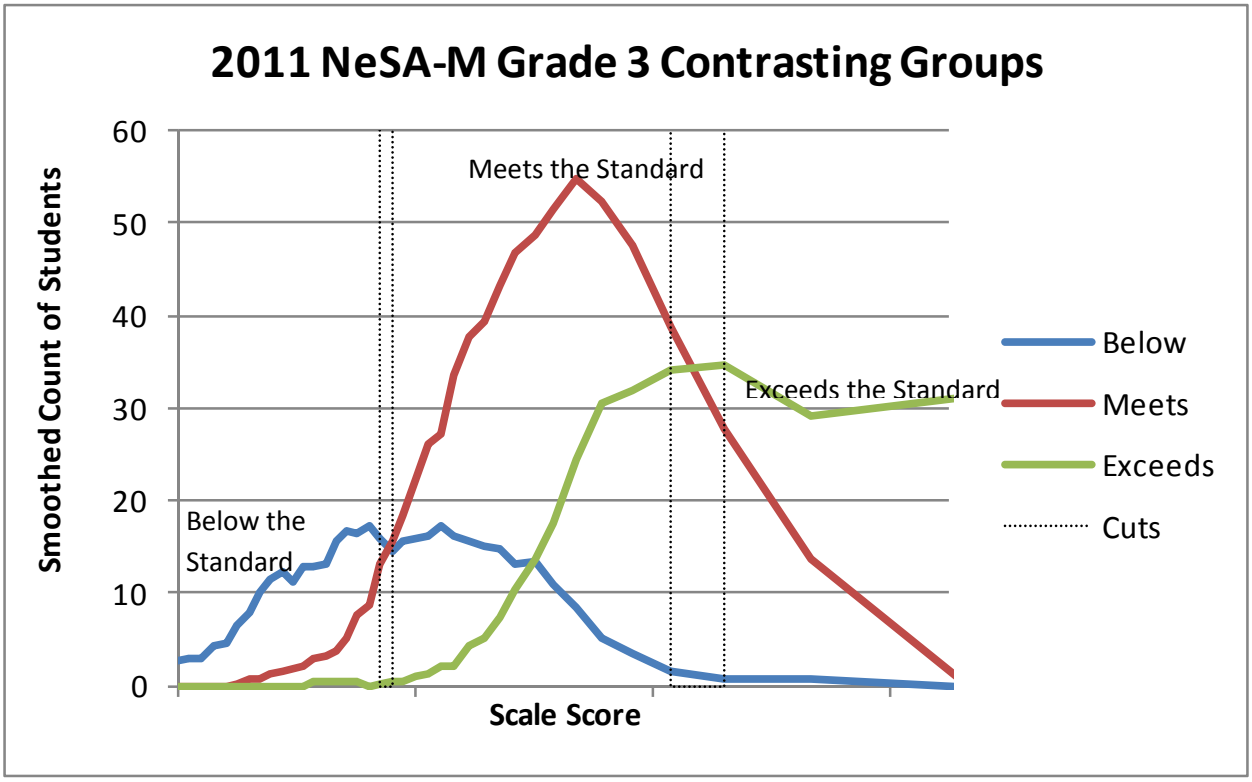
The cut scores were determined as the point for which the higher Performance Level became more likely than the lower level for students with the same observed score. The likelihood for Below the Standards, shown in Table 4.1.3, is the ratio of the number in the Below group divided by the number in Meets the Standards. Specifically, the line is drawn when the odds of Meets the Standards over Below the Standards exceeds 1.0. There is some ambiguity about the exact logit value of the cut score because there exact point will fall between two raw scores and because they will typically be some fluctuation in the observed counts. Both can be moderated by smoothing and interpolating. Table 4.1.3 and Figure 4.1.1 illustrate the process for Grade 3.

Table 4.1.3: Calculation for 2011 Grade 3 NeSA-Mathematics Contrasting Groups Performance Standards

									Odds of Higher Level	
Number Correct	Logit Ability	Counts of Teacher Ratings				Smoothed Counts			Meets to Below	Exceeds to Meets
		Below	Meets	Exceeds	Total	Below	Meets	Exceeds		
27	-1.175	12	4	2	18	15.6	3.8	0.4	0.24	0.11
28	-1.083	18	5	0	23	16.8	5.0	0.4	0.30	0.08
29	-0.991	21	4	0	25	16.4	7.6	0.4	0.46	0.05
30	-0.897	15	9	0	24	17.2	8.8	0.0	0.51	0.00
31	-0.802	16	16	0	32	16.0	13.0	0.2	0.81	0.02
32	-0.705	16	10	0	26	14.6	15.6	0.4	1.07	0.03
33	-0.606	12	26	1	39	15.6	18.4	0.4	1.18	0.02
34	-0.504	14	17	1	32	15.8	22.2	1.0	1.41	0.05
35	-0.399	20	23	0	43	16.2	26.2	1.2	1.62	0.05
36	-0.290	17	35	3	55	17.2	27.2	2.0	1.58	0.07
37	-0.177	18	30	1	49	16.2	33.6	2.2	2.07	0.07
38	-0.059	17	31	5	53	15.6	37.6	4.2	2.41	0.11
39	0.066	9	49	2	60	15.0	39.2	5.0	2.61	0.13
40	0.199	17	43	10	70	14.8	43.2	7.4	2.92	0.17
41	0.341	14	43	7	64	13.2	46.8	10.4	3.55	0.22
42	0.496	17	50	13	80	13.4	48.8	13.6	3.64	0.28
43	0.666	9	49	20	78	11.0	51.4	17.4	4.67	0.34
44	0.856	10	59	18	87	8.4	54.8	24.4	6.52	0.45
45	1.074	5	56	29	90	5.0	52.4	30.6	10.48	0.58
46	1.333	1	60	42	103	3.6	47.6	32.0	13.22	0.67
47	1.656	0	38	44	82	1.6	38.8	34.2	24.25	0.88
48	2.097	2	25	27	54	0.6	27.8	34.6	46.33	1.24
49	2.825	0	15	29	44	0.7	13.7	29.0	20.50	2.12
50	4.054	0	1	31	32	0.0	1.0	31.0		31.00

The likelihood of level Meets the Standards becomes less likely than level Exceeds the Standards between raw scores 47 and 98, which correspond to logits of 1.656 and 2.097. Any logit value in this range would be consistent with the teacher ratings. As suggested above, the line between Below the Standards and Meets the Standards falls between raw scores 31 and 32. The logit cutpoint is in the range of -0.802 and -0.705.

Figure 4.1.1: Relative Frequencies in Teacher-Rated Performance Levels and Cut Score Ranges



4.2 Modified Bookmark Procedure

The Bookmark process, including training, was completed in three days, Monday through Wednesday, June 27-29, 2011. The outline and agenda for the Bookmark event are presented in Appendix B.1. The teachers were place in three grade-grouped panels: lower, middle, and high school. The intent of the grade groupings was to ensure panelists worked with content with which they were familiar while giving each panel more breadth, and the result more continuity across grades. The precise groupings were realigned between days to match panelists to the most appropriate grade. The groupings and timing are diagramed in Appendix B.2.

Training was conducted Monday morning with a single trainer for a single large group of the three panels. Training materials included:

- Performance Level Descriptors
- Sample Ordered Item Booklet
- Sample Item Map
- Sample Item Separation Chart
- Sample Rating Form

Participants were told that:

- their bookmark placement should reflect the their own opinions and not the group consensus;
- they should contribute their own personal experience and expertise to the group discussion and recommendation;
- They would have the opportunity discuss, reconsider, and revise their placements in later rounds, and
- all materials and discussions were secure and were not to leave the meeting room,

The critical objective of the training was to ensure the panelists understood the task being presented to them. Components included an overview of their role in the process, a detailed description of all steps in the Bookmark method, and a practice exercise based on a short test form drawn from released NeSA-Mathematics items. The point of the practice exercise was to provide hands-on experience with the steps and allow the panelists to receive any additional explanation they needed or requested. A copy of the slides used for training is presented in Appendix C.

The actual Bookmark process included three iterations (rounds) of individual judgments, large group discussions between rounds, and opportunities to revise individual judgments. After the first and second rounds, panelists had the opportunity to review impacts in the form of percentage of students in each Performance Level, resulting from the group recommendation. In addition, panels for the appropriate grades were shown relevant NAEP and ACT statistics.

After the training and practice exercise, the panelist broke into the smaller groups by grade. The process began with the panelists working through the spring operational form of NeSA-Mathematics. This task was included to give panelists a direct appreciation of the students NeSA-Mathematics experience. They were encouraged to take notes concerning their impressions of the items. Then a review of the Performance Level Descriptors specific to that grade was provided to sharpen the understanding of what was expected of students at each level. Panelists were encouraged to highlight the language differentiating the Performance Levels. After a short discussion and clarifications, the actual work began.

Round 1. In Round 1 participants reviewed the Ordered Item Booklets independently to ensure the initial bookmarks were independent of other panelists' opinions. During this review, panelists were asked to determine the knowledge, skills, and competencies required to respond correctly to each progressively more difficult item and when the requirements of the items exceeded the capabilities of the borderline students. It was emphasized that the work for this round was to be individual.

The bookmarks were to be placed so that the borderline student has mastered the items before the bookmark and not those after the bookmark. To reduce counter-productive discussion about the placement of specific items in the Ordered Item Booklet, panelists were reminded that the placement was empirical based on the spring assessment and that they should focus on the progression of items rather than the details of individual items.

Round 2. The results from Round 1 were presented and explained at the beginning of Round 2. The bookmark page numbers for each panelist, the median page number of the full panel, the distribution of cut scores for each Performance Level, and the *impact* data were reviewed with the panelists. The impact data was the percentage of students placed in each Performance Level based on Spring 2011 NeSA-Mathematics student performance and panelists' Round 1 recommendations. Panelists were then asked to provide rationales for their Round 1 placements and discuss what skills and knowledge were required. During the discussion, there was no attempt to achieve consensus; the bookmark placements were to reflect the opinions of the individual panelists.

After the group discussion, panelists were given the opportunity to revise their bookmark placements. The individual locations were again collected and used to calculate revised cut scores and impact data for the full panel.

Round 3. Panelists reviewed Round 2 results and the relevant Contrasting Groups data. When applicable to the grade, the NAEP (grades 4 and 8) and ACT (grade 11) data were also provided. Again, panelists were instructed to explain the thinking for their Round 2 placements in terms of the skills and knowledge required. Following the discussion, the panelists made any final adjustment to their individual placements. These ratings were recorded and used to produce the final group recommendation.

4.3 Vertical Articulation Across Grades

For accountability and monitoring longitudinal progress, it is important that the Performance Levels are coherent across grades. One would expect, for example, that the percentage meeting or exceeding the standards would be *consistent*, perhaps trending up or down but not fluctuating erratically. This becomes more critical when Performance Levels with high stakes consequences are established for contiguous grades.

Three distinct methods were used to ensure coherence. First, the common introduction and training for all panelists ensured a common understanding of the Performance Level Descriptors and the bookmarking task. Second, the grade groupings ensured the panelists were familiar with, and participated in, the deliberations and recommendations for grades adjacent to their own. This was enhanced by large group sessions each morning that allowed for more general, cross-grade discussion. Finally, after the panelists completed their work, the group recommendations were statistically smoothed to achieve coherent percents in each Performance Level. This approach considered the data from all grades simultaneously. Any trend over grades was established by the panels, but it was assumed that the entire body of data was more reliable than any one grade.

4.4 Merging Bookmark and Contrasting Groups

The item-based Bookmark method was the designated method of record. The Bookmark results were the crux of the recommendation to the State Board of Education. The recommendation was developed by experts on education in Nebraska, primarily classroom teachers, from their

understanding of the Performance Level Descriptors, and their assessment of the knowledge, skills, and behaviors required by the operational items and after receiving extensive training on the process and the Performance Level Descriptors.

The Contrasting Groups survey involved a different sample from the same population of experts. The focus for this method was on students known to the teacher and on the Performance Level best describing each of those students, independent of any assessment. The Performance Level Descriptors were available on demand as a pop-up for the participants in the Contrasting Groups, and there was group (online) training to ensure a common understanding of the Performance Level Descriptors.

The final recommendation to the State Board of Education was based on a composite that used both sets of data with smoothing.

5. Analyses and Results

5.1 Overview

Summaries of the NeSA-Mathematics Performance Level Standard Setting process are provided in Tables 5.1.1-3. The tables include the five options discussed with the State Board of Education.

1. Bookmark
2. Contrasting Groups
3. Average of Bookmark and Contrasting Groups
4. Results from Option 3 statistically smoothed across grades
5. Board Approved

The raw score ranges (Table 5.1.1) are specific to 2011 exam and will vary slightly from year to year with minor differences in form difficulty. For each Performance Level, the minimum raw score is the lowest score for which the corresponding logit is greater than or equal to the logit standard for that level. This determination is made in the logit metric to avoid rounding issues.

The logit metric score ranges (Table 5.1.2) are presented in the native Rasch metric. They are the basis for all calculations beginning with the construction of the Ordered Item Booklets and the derivation of the standards from the panelists' recommendations.

The final table in this section, 5.1.3, presents the 2011 impacts (percent in each Performance Level) of the five options discussed. The process used by the State Board of Education to arrive at the final approved cut score ranges may be found in Section 5.4, below.

Table 5.1.1: Raw Score Ranges by Performance Level for Five Options

Raw Score Ranges by Performance Level															
	Option 1 – Bookmark (BMK)			Option 2 - Contrasting Groups (CG)			Option 3 - Average of BMK & CG			Option 4 – Articulated over Grades			Option 5 – Board Approved		
	Below	Meets	Exceed	Below	Meets	Exceed	Below	Meets	Exceed	Below	Meets	Exceed	Below	Meets	Exceed
3	1 to 29	30 to 40	41 to 50	1 to 31	32 to 47	48 to 50	1 to 31	32 to 45	46 to 50	1 to 30	31 to 44	45 to 50	1 to 33	34 to 45	46 to 50
4	1 to 32	33 to 44	45 to 55	1 to 37	38 to 51	52 to 55	1 to 35	36 to 49	50 to 55	1 to 34	35 to 49	50 to 55	1 to 37	38 to 50	51 to 55
5	1 to 32	33 to 45	46 to 55	1 to 36	37 to 52	53 to 55	1 to 35	36 to 50	51 to 55	1 to 34	35 to 49	50 to 55	1 to 37	38 to 50	51 to 55
6	1 to 32	33 to 45	46 to 58	1 to 37	38 to 54	55 to 58	1 to 35	36 to 51	52 to 58	1 to 37	38 to 52	53 to 58	1 to 41	42 to 53	54 to 58
7	1 to 33	34 to 45	46 to 58	1 to 38	39 to 53	54 to 58	1 to 36	37 to 50	51 to 58	1 to 35	36 to 50	51 to 58	1 to 38	39 to 52	53 to 58
8	1 to 33	34 to 46	47 to 60	1 to 39	40 to 56	57 to 60	1 to 37	38 to 53	54 to 60	1 to 38	39 to 53	54 to 60	1 to 41	42 to 55	56 to 60
11	1 to 33	34 to 43	44 to 60	1 to 37	38 to 54	55 to 60	1 to 36	37 to 50	51 to 60	1 to 34	35 to 49	50 to 60	1 to 37	38 to 51	52 to 60

Table 5.1.2: Logit Performance Standards for Five Options

Logit Performance Levels															
	Option 1 – Bookmark (BMK)			Option 2 - Contrasting Groups (CG)			Option 3 - Average of BMK & CG			Option 4 – Articulated over Grades			Option 5 – Board Approved		
	Below	Meets	Exceed	Below	Meets	Exceed	Below	Meets	Exceed	Below	Meets	Exceed	Below	Meets	Exceed
3		-0.897	0.341		-0.705	2.097		-0.801	1.219		-0.895	0.982		-0.6000	1.1000
4		-0.989	0.424		-0.520	1.736		-0.754	1.080		-0.837	0.954		-0.6000	1.2000
5		-0.936	0.429		-0.580	2.157		-0.758	1.293		-0.813	0.994		-0.5700	1.1597
6		-1.159	0.040		-0.745	1.703		-0.952	0.872		-0.766	0.975		-0.4700	1.1816
7		-0.806	0.333		-0.377	1.694		-0.591	1.014		-0.699	0.897		-0.4500	1.2500
8		-0.981	0.126		-0.514	1.853		-0.748	0.990		-0.649	0.930		-0.4000	1.3000
11		-0.515	0.273		-0.218	1.708		-0.366	0.990		-0.511	0.805		-0.2900	1.1000

Table 5.1.3: Percent 2011 NeSA-Mathematics Students by Performance Level for Five Options

Percent in Performance Level															
	Option 1 – Bookmark (BMK)			Option 2 - Contrasting Groups (CG)			Option 3 - Average of BMK & CG			Option 4 – Articulated over Grades			Option 5 – Board Approved		
	Below	Meets	Exceed	Below	Meets	Exceed	Below	Meets	Exceed	Below	Meets	Exceed	Below	Meets	Exceed
3	22.3	35.7	42.0	26.9	65.5	7.6	26.9	55.6	17.5	24.6	53.1	22.3	32.7	49.8	17.5
4	20.2	40.9	38.9	32.4	56.1	11.5	27.0	52.3	20.7	24.5	54.8	20.7	32.4	51.7	15.9
5	22.8	37.8	39.4	31.5	59.9	8.6	29.1	53.2	17.7	26.9	50.6	22.5	34.1	48.2	17.7
6	18.0	31.7	50.3	27.8	58.5	13.7	23.5	48.9	27.6	27.8	49.1	23.1	37.3	44.3	18.4
7	26.1	33.4	40.5	38.5	48.7	12.8	33.2	43.6	23.2	30.6	46.2	23.2	38.5	45.3	16.2
8	23.0	29.2	47.8	34.8	53.2	12.0	30.3	45.7	24.0	32.6	43.4	24.0	39.5	44.5	16.0
11	37.8	21.0	41.2	46.0	41.0	13.0	44.1	32.1	23.8	39.8	33.9	26.3	46.0	32.8	21.2

5.2 Contrasting Groups Analyses

The Contrasting Groups method asked teachers to evaluate students in their own classes and assign Performance Levels to each based on the Performance Level Descriptors without considering performance on the NeSA. After the assessment, the estimated cut score for each Performance Level from the Contrasting Groups survey is the point on the scale for which the likelihood of the higher Performance Level surpasses the likelihood of the lower level. Table 5.2.1 shows the relevant portion for the grade 3 NeSA-Mathematics data. This table tabulates the number of students at each NeSA-Mathematics number correct score that teachers assigned to each Performance Level. For example, of the students rated in the Contrasting Groups survey, 26 students have a number correct score of 32. Of these, 16 were rated as Below the Standards and 10 as Meets the Standards. The smoothed counts, using a 5-point moving average, were 14.6 for Below the Standards, 15.6 for Meets the Standards, (and 0.4 for Exceeds the Standards). The odds of belonging to Meets the Standards rather than Below the Standards, given a number correct of 32, is 15.6 / 14.6 = 1.07.

Table 5.2.1: Extracted from Grade 3 Contrasting Groups Results

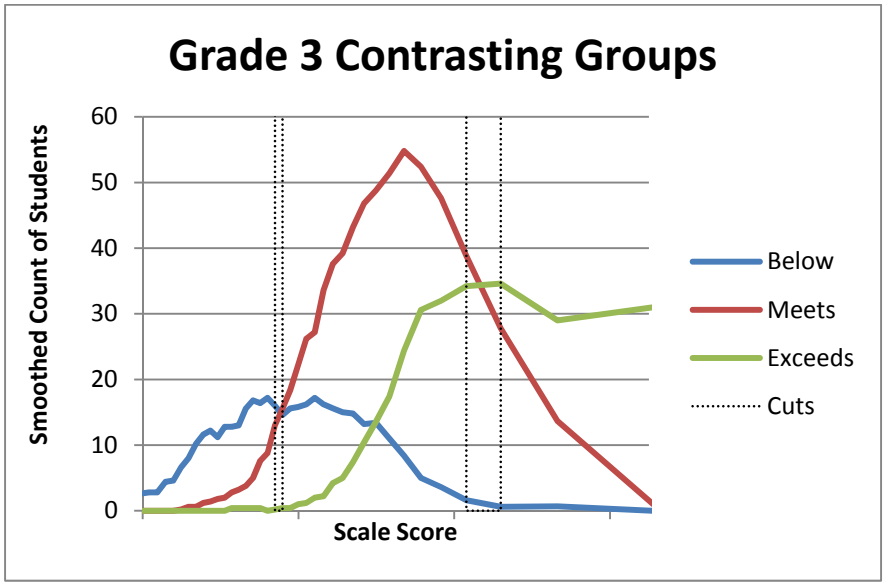
Number Correct	Logit Ability	Teacher Rank			Total Count	Odds[2]	
		Below	Meets	Exceeds		Meets to Below	Exceeds to Meets
29	-0.991	21	4	0	25	0.46	0.05
30	-0.897	15	9	0	24	0.51	0.00
31	-0.802	16	16	0	32	0.81	0.02
32	-0.705	16	10	0	26	1.07	0.03
33	-0.606	12	26	1	39	1.18	0.02
34	-0.504	14	17	1	32	1.41	0.05
35	-0.399	20	23	0	43	1.62	0.05
36	-0.290	17	35	3	55	1.58	0.07
37	-0.177	18	30	1	49	2.07	0.07
38	-0.059	17	31	5	53	2.41	0.11
39	0.066	9	49	2	60	2.61	0.13
40	0.199	17	43	10	70	2.92	0.17
41	0.341	14	43	7	64	3.55	0.22
42	0.496	17	50	13	80	3.64	0.28
43	0.666	9	49	20	78	4.67	0.34
44	0.856	10	59	18	87	6.52	0.45
45	1.074	5	56	29	90	10.48	0.58
46	1.333	1	60	42	103	13.22	0.67
47	1.656	0	38	44	82	24.25	0.88
48	2.097	2	25	27	54	46.33	1.24
49	2.825	0	15	29	44	20.50	2.12
50	4.054	0	1	31	32		31.00

In this example, the odds (second column from right) of a student being at the Meets the Standards level instead of Below the Standards becomes greater than 1.0 at a Number Correct score of 32, meaning the Contrasting Groups recommended minimum number correct score for Meets the Standards is 32. Similarly, the odds (last column on right) for being in Exceeds the Standards rather than Meets the Standards, is at a number correct of 48.

This is illustrated graphically for grade 3 in Figure 5.2.1 below. The scale score cut point between Below the Standards and Meets the Standards is the point at which the red line crosses the blue line. For Meets the Standards and Exceeds the Standards, it is the point at which the green line crosses the red line.

[2] Odds were computed from smoothed counts and cannot be computed directly from the data shown in the table.

Figure 5.2.1: Grade Three Contrasting Groups Results



While 32 is the recommended minimum Number Correct score for the cut between Below the Standards and Meets the Standards for the 2011 assessment, the recommended logit (or scale score) to be used going forward is between -0.802 and -0.705 (the logits for 31 and 32.) This is illustrated above because no number correct score in general will pass exactly through the intersection of the two curves. A very good approximation to the intersection can be obtained by a simple linear interpolation.

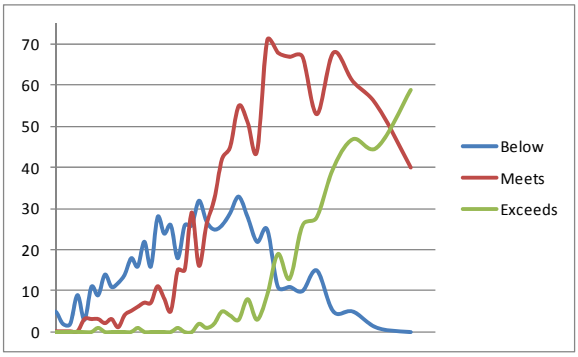
$$Logit(\text{cutscore}) = Logit(31) + \{Logit(32) - Logit(31)\}\{\frac{1-Odds(31)}{Odds(32)-Odds(31}\}.$$

$$Logit(\text{cutscore}) = -0.802 + \{-0.705 + 0.802\}[\frac{1-0.81}{1.07-0.81}] = -0.73.$$

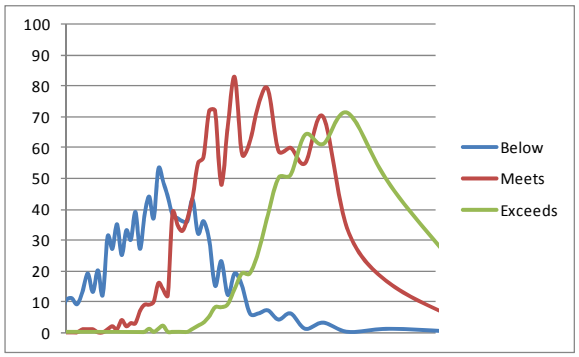
Detailed tables of the Contrasting Groups results are presented in Appendix G.

Contrasting Groups Results: Counts before smoothing

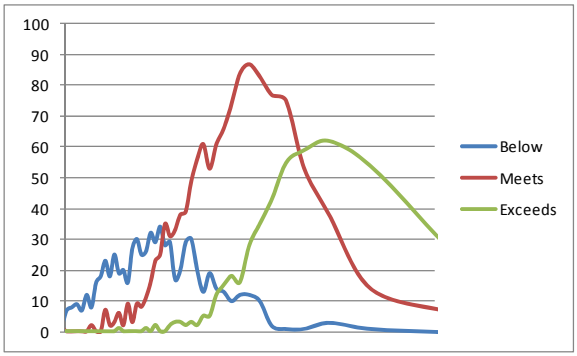
Grade 4:



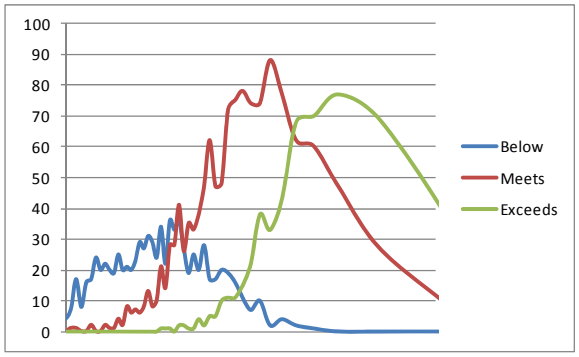
Grade 7:



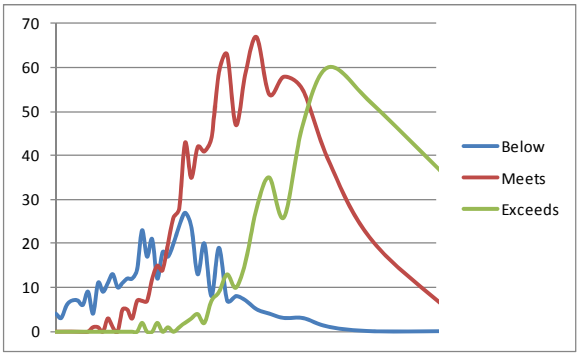
Grade 5:



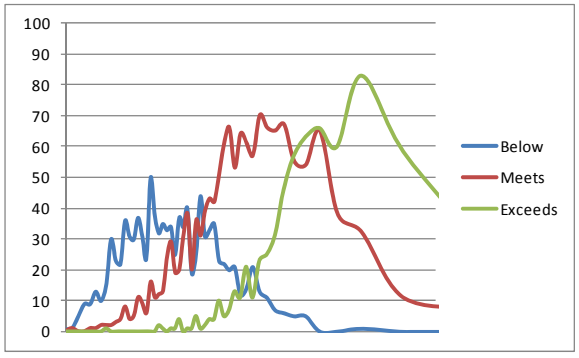
Grade 8



Grade 6:



Grade 11



5.3 Bookmark Analyses

The Bookmark method asks the panelists to move through the items in order of increasing difficulty and place a bookmark between the pages separating items the *borderline* student has *mastered* from items this student has not mastered. The *borderline* student is a student whose proficiency just surpasses the Performance Level Descriptors for the lower level. *Mastery* was defined as a 0.67 likelihood of succeeding on the item. For the NeSA, two bookmarks are required: between Below the Standards and Meets the Standards and between Meets the Standards and Exceeds the Standards. Proficiency levels are again defined by the Performance Level Descriptors, given in Appendix A, as they were for Contrasting Groups.

The bookmarks placed by the panelists are summarized in Table 5.3.1. The values are page numbers in the Ordered Item Booklets.

Table 5.3.1: Bookmark Page Number Medians and Standard Errors

	Number of Panelists	Rd 1 B/M	Rd 1 M/E	Rd 2 B/M	Rd 2 M/E	Rd 3 B/M	Rd 3 M/E
Grade 3	39						
Median		23	43	23	46	20	46
Std Dev		4.89	3.41	4.07	1.78	3.16	1.28
SE (med)		0.98	0.68	0.81	0.36	0.63	0.26
Grade 4	39						
Median		17	42	20	45	20	47
Std Dev		5.56	4.23	3.72	2.44	3.76	2.87
SE (med)		1.11	0.85	0.74	0.49	0.75	0.57
Grade 5	39						
Median		23	50	23	50	23	50
Std Dev		2.88	6.33	2.06	3.53	2.49	2.33
SE (med)		0.58	1.27	0.41	0.71	0.50	0.47
Grade 6	36						
Median		19	45	19	47	20	47
Std Dev		4.59	2.70	3.44	2.74	2.26	2.76
SE (med)		0.96	0.56	0.72	0.57	0.47	0.58
Grade 7	35						
Median		19	41	19	46	19	46
Std Dev		5.47	5.13	1.84	4.01	1.68	3.97
SE (med)		1.16	1.08	0.39	0.85	0.36	0.84
Grade 8	51						
Median		16	47	15	51	15	53
Std Dev		5.20	5.68	3.48	4.04	3.66	3.41
SE (med)		0.91	0.99	0.61	0.71	0.64	0.60
Grade 11	16						
Median		19	38	16	40	12	44
Std Dev		5.45	4.30	4.67	3.48	4.03	3.01
SE (med)		1.70	1.34	1.46	1.09	1.26	0.94

Each page number in the Ordered Item Booklet represents an item location and the item has a logit difficulty estimate. Any logit difficulty can be translated into a logit ability corresponding to the 0.67 likelihood. The Rasch probability will be 0.67 when the person's ability exceeds the item's difficulty by natural log of 2 because:

1. $Prob(correct) = \frac{e^{b-d}}{1+e^{b-d}} = \frac{e^{ln2}}{1+e^{ln2}} = \frac{2}{1+2} = 0.67.$

Consequently, the upper bound on the recommended logit cut score is the minimum logit ability that is higher than the bookmarked item's difficulty plus *ln(2) = 0.693*. This is an upper bound because the bookmark is actually placed before the item's page in the Ordered Item Booklet and all that is known about the panelist's implied standard is that is no higher than the bookmarked item. The logit is rounded up again to align with minimum raw score on the operational test that is equal to or greater than the logit implied by the bookmark.

5.4 Recommendation and Approval of State Board of Education

The State Board of Education reviewed the results from the Bookmark Study (Option 1), the Contrasting Groups study (Option 2), the average of the two studies (Option 3), and an across grade articulation of Option 3 (Option 4) The State Board approved Option 5 (see Tables 5.1.1-5.1.3 for summary information associated with each of the five options). Note that Option 5 was adjusted somewhat higher (more challenging), but by no more than one standard error of measurement from the results presented as Option 4.

Final Scaling: The scale score metric was derived from the logits so that the minimum scale score for Meets the Standards was 85 and the minimum score for Exceeds the Standards was 135 for all grades. The calculations for the NeSA-Mathematics scale score conversion are in Table 5.4.2.

Table 5.4.2: Conversion of Logits to Scale Scores

	Logit Cutpoints		Scale Score Ranges by Performance Level			Logit to Scale Score Conversion	
Grade	B/M	M/E	Below	Meets	Exceeds	Slope	Intercept
3	-0.6000	1.1000				29.41176	102.15706
4	-0.6000	1.2000				27.77778	101.17667
5	-0.5700	1.1597				28.90675	100.98685
6	-0.4700	1.1816	1 to 84	85 to 134	135 to 200	30.27367	98.73862
7	-0.4500	1.2500				29.41176	97.74529
8	-0.4000	1.3000				29.41176	96.27470
11	-0.2900	1.1000				35.97122	94.94165

5.5 Panelists' Survey Evaluation Results

The final step of the Standard Setting process was asking the panelists to complete an evaluation on the Standard Setting meeting itself. This information was used to assess the panelists' impression of the validity of the process and their confidence in the result. A copy of the instrument is included in Appendix H and a summary of the results is included Appendix I.

Overall the panelists felt training was *adequate* and the time allotted was *appropriate*. They also felt the practice examples were *useful*. Panelists agree that the PLD's:

- Provided adequate information,
- Captured what students should know and be able to do,
- Communicated a reasonable profile of student achievement at each standard,
- Were helpful in making decisions regarding cutpoints.

Panelists also *agreed* that adequate time was provided to gain understanding of the PLD's. All materials for the standard setting were rated *useful*. Panelists were *satisfied* with all staff and felt the time allotted for placing their rankings was *about right*. Lastly, most panelists were *confident* in their rankings. All panelists were provided index cards to make comments and all comments were then turned over to the State Department of Education.

6. References

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Wright, B. & Stone, M. (1979). *Best test design*. Chicago: MESA Press.

Appendices

Appendix A: NeSA-Mathematics Performance Level Descriptors

The Performance Level Descriptors provide meaning to the scale score metric and give a qualitative description of the numeric scores. The attached Performance Level Descriptors were used by the panelists during both the Bookmark Standard Setting and the Contrasting Groups study. The labels used for the levels were *Below the Standards, Meets the Standards,* and *Exceeds the Standards.*

Nebraska State Accountability-Mathematics (NeSA-M) Performance Level Descriptor
Grade 3

Below the Standards

Overall student performance in mathematics reflects *unsatisfactory* performance on the standards and *insufficient* understanding of the content at third grade. A student scoring at the Below the Standards level *inconsistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***inconsistently***:

- Demonstrates equivalent representations of numbers up to 10,000.
- Compares and orders whole numbers through the thousands.
- Identifies fractions (fourths, thirds, halves) as parts of a whole and/or parts of a set.
- Rounds numbers to the hundreds.
- Recognizes multiplication as repeated addition and an array.
- Identifies the attributes of two-dimensional shapes (e.g., sides, angles, vertices).
- Identifies congruent two-dimensional figures.
- Determines the distance between two points on a number line.
- Identifies appropriate customary measurement units (length).
- Compares and orders metric length (meters).
- Identifies and extends numeric patterns.
- Identifies models that represent situations involving addition and subtraction.
- Solves one-step equations involving addition and subtraction.
- Interprets data using pictographs and bar graphs.

Meets the Standards

Overall student performance in mathematics reflects *satisfactory* performance on the standards and *sufficient* understanding of the content at third grade. A student scoring at the Meets the Standards level *generally* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***generally***:

- Demonstrates equivalent representations of numbers up to 10,000.
- Compares and orders whole numbers through the thousands.
- Identifies fractions (fourths, thirds, halves) as parts of a whole and/or parts of a set.
- Rounds numbers to the thousands.
- Recognizes multiplication as repeated addition and an array.
- Identifies the attributes of two-dimensional shapes (e.g., sides, angles, vertices).
- Identifies congruent two-dimensional figures.
- Determines the distance between two points on a number line.
- Identifies appropriate customary measurement units (length, weight, capacity/volume).
- Compares and orders metric length (centimeters, meters).
- Identifies, describes, and extends numeric patterns.
- Identifies models that represent situations involving addition and subtraction.
- Solves one-step equations involving addition and subtraction.
- Interprets data using bar graphs.

Exceeds the Standards

Overall student performance in mathematics reflects *high academic* performance on the standards and a *thorough* understanding of the content at or above third grade. A student scoring at the Exceeds the Standards level *consistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***consistently***:

- Demonstrates equivalent representations of numbers up to 10,000.
- Compares and orders whole numbers through the thousands.
- Identifies fractions as parts of a whole and/or parts of a set.
- Rounds numbers to the thousands.
- Recognizes multiplication as repeated addition and an array.
- Identifies the attributes of two-dimensional shapes (e.g., sides, angles, vertices).
- Identifies congruent two-dimensional figures.
- Determines the distance between two points on a number line.
- Identifies appropriate customary measurement units (length, weight, capacity/volume).
- Compares and orders metric length.
- Identifies, describes, and extends numeric patterns.
- Identifies models that represent situations involving addition and subtraction.
- Solves one-step equations involving addition and subtraction.
- Interprets data using double bar graphs.

Nebraska State Accountability-Mathematics (NeSA-M) Performance Level Descriptor
Grade 4

Below the Standards	**Meets the Standards**	**Exceeds the Standards**
Overall student performance in mathematics reflects *unsatisfactory* performance on the standards and *insufficient* understanding of the content at fourth grade. A student scoring at the Below the Standards level *inconsistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems. *A* student at this level ***inconsistently***: • Demonstrates equivalent representations of decimals through the hundredths place. • Compares and orders whole numbers and decimals through the hundredths place. • Identifies fractions as parts of a whole and/or parts of a set. • Identifies equivalent forms of fractions using models. • Locates fractions on a number line. • Recognizes division as repeated subtraction or equal sharing. • Adds and subtracts decimals to the hundredths place. • Multiplies two-digit whole number by a whole number. • Solves multiplication and division problems involving powers of ten. • Selects appropriate methods of computation when problem solving. • Identifies the attributes of two-dimensional shapes and three-dimensional objects (e.g., sides: perpendicular, parallel, intersecting; angles: acute, obtuse, right). • Identifies the location of an ordered pair in the first quadrant. • Solves problems involving elapsed time to the hour. • Identifies appropriate metric measurement unit (length, weight, capacity/volume). • Computes simple unit conversions for length. • Selects appropriate symbolic notations including ≥ and ≤. • Identifies symbolic representations of the commutative property. • Solves simple one-step whole number equations. • Compares the same set of data in different formats (tables, pictographs, bar graphs, line graphs). • Interprets dot/line plots.	Overall student performance in mathematics reflects *satisfactory* performance on the standards and *sufficient* understanding of the content at fourth grade. A student scoring at the Meets the Standards level *generally* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems. A student at this level ***generally***: • Demonstrates equivalent representations of decimals through the hundredths place. • Compares and orders whole numbers and decimals through the hundredths place. • Identifies fractions as parts of a whole and/or parts of a set. • Identifies equivalent forms of fractions. • Locates fractions on a number line. • Recognizes division as repeated subtraction or equal sharing. • Adds and subtracts decimals to the hundredths place. • Multiplies two-digit whole numbers. • Solves multiplication and division problems involving powers of ten. • Selects and applies appropriate methods of computation when problem solving. • Identifies the attributes of two-dimensional shapes and three-dimensional objects (e.g., sides: perpendicular, parallel, intersecting; angles: acute, obtuse, right). • Identifies the location of an ordered pair in the first quadrant. • Solves problems involving elapsed time. • Identifies appropriate metric measurement unit (length, weight, capacity/volume). • Computes simple unit conversions for length. • Selects appropriate symbolic notations including ≥ and ≤. • Identifies symbolic representations of the commutative property. • Solves simple one-step whole number equations. • Compares and makes predictions from the same set of data in different formats (tables, pictographs, bar graphs, line graphs). • Interprets dot/line plots.	Overall student performance in mathematics reflects *high academic* performance on the standards and a *thorough* understanding of the content at or above fourth grade. A student scoring at the Exceeds the Standards level *consistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems. A student at this level ***consistently***: • Demonstrates equivalent representations of decimals through the hundredths place. • Compares and orders whole numbers and decimals through the hundredths place. • Identifies fractions as parts of a whole and/or parts of a set. • Identifies equivalent forms of fractions. • Locates fractions on a number line. • Recognizes division as repeated subtraction or equal sharing. • Adds and subtracts decimals to the hundredths place. • Multiplies two-digit whole numbers. • Solves multiplication and division problems involving powers of ten. • Selects and applies appropriate methods of computation when solving multiple-step problems. • Identifies the attributes of two-dimensional shapes and three-dimensional objects (e.g., sides: perpendicular, parallel, intersecting; angles: acute, obtuse, right). • Identifies the location of an ordered pair in the first quadrant. • Solves problems involving elapsed time between AM and PM. • Identifies appropriate metric measurement unit (length, weight, capacity/volume). • Computes unit conversions for length. • Selects appropriate symbolic notations including ≥ and ≤. • Identifies symbolic representations of the commutative property. • Solves one-step whole number equations. • Compares and makes predictions from the same set of data in different formats (tables, pictographs, bar graphs, line graphs). • Interprets dot/line plots.

Nebraska State Accountability-Mathematics (NeSA-M) Performance Level Descriptor
Grade 5

Below the Standards

Overall student performance in mathematics reflects *unsatisfactory* performance on the standards and *insufficient* understanding of the content at fifth grade. A student scoring at the Below the Standards level *inconsistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***inconsistently***:

- Demonstrates equivalent representations of decimals through the thousandths place.
- Compares and orders fractions with like denominators.
- Compares and orders decimals through the thousandths place.
- Identifies fractions in simplest form.
- Finds common denominators.
- Identifies equivalent forms of common fractions, decimals, and percents.
- Identifies prime and composite numbers.
- Identifies factors and multiples of a whole number.
- Identifies the distributive property of multiplication.
- Adds and subtracts positive rational numbers (e.g., decimals).
- Selects appropriate methods of computation when solving multiple-step problems.
- Multiplies decimals.
- Divides a decimal by a whole number.
- Estimates the sums and differences of whole numbers.
- Identifies the attributes of triangular and rectangular prisms (e.g., edges, faces, vertices).
- Identifies the degrees on a circle.
- Plots the location of an ordered pair in the first quadrant.
- Identifies correct unit (customary or metric) to the measurement situation.
- Determines the area of rectangles and squares.
- Identifies models that represent addition, subtraction, and multiplication (e.g., words, graphs, tables).
- Identifies symbolic representations of the associative property.
- Evaluates numerical expressions using order of operations.
- Evaluates simple algebraic expressions (addition, subtraction).
- Solves one-step addition and subtraction equations.
- Draws conclusions on the same set of data in different formats (tables, pictographs, bar graphs, line graphs).
- Identifies a list of possible outcomes for a simple event.
- Describes the likelihood of a possible event.

Meets the Standards

Overall student performance in mathematics reflects *satisfactory* performance on the standards and *sufficient* understanding of the content at fifth grade. A student scoring at the Meets the Standards level *generally* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***generally***:

- Demonstrates equivalent representations of decimals through the thousandths place.
- Compares and orders fractions.
- Compares and orders decimals through the thousandths place.
- Identifies fractions in simplest form.
- Finds common denominators.
- Identifies equivalent forms of common fractions, decimals, and percents.
- Identifies prime and composite numbers.
- Identifies factors and multiples of a whole number.
- Identifies the distributive property of multiplication.
- Adds and subtracts positive rational numbers (e.g., fractions, decimals).
- Selects and applies appropriate methods of computation when solving multiple-step problems.
- Multiplies decimals.
- Divides a decimal by a whole number.
- Estimates the sums and differences of positive rational numbers.
- Identifies the attributes of triangular and rectangular prisms (e.g., edges, faces, vertices).
- Identifies the degrees on a circle.
- Plots the location of an ordered pair in the first quadrant.
- Identifies correct unit (customary or metric) to the measurement situation.
- Determines the area of rectangles and squares.
- Identifies models that represent addition, subtraction, and multiplication (e.g., words, graphs, tables).
- Identifies symbolic representations of the associative property.
- Evaluates numerical expressions using order of operations.
- Evaluates simple algebraic expressions (addition, subtraction).
- Solves one-step addition and subtraction equations.
- Draws conclusions on the same set of data in different formats (tables, pictographs, bar graphs, line graphs).
- Identifies a list of possible outcomes for a simple event.
- Describes the likelihood of a possible event.

Exceeds the Standards

Overall student performance in mathematics reflects *high academic* performance on the standards and a *thorough* understanding of the content at or above fifth grade. A student scoring at the Exceeds the Standards level *consistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***consistently***:

- Demonstrates equivalent representations of decimals through the thousandths place.
- Compares and orders fractions.
- Compares and orders decimals through the thousandths place.
- Identifies fractions and mixed numbers in simplest form.
- Finds common denominators.
- Identifies equivalent forms of fractions, decimals, and percents (e.g., mixed numbers).
- Identifies prime and composite numbers.
- Identifies factors and multiples of a whole number.
- Identifies the distributive property of multiplication.
- Adds and subtracts positive rational numbers (e.g., fractions, decimals).
- Selects and applies appropriate methods of computation when solving multiple-step problems.
- Multiplies and divides decimals.
- Estimates the sums and differences of positive rational numbers and analyzes the reasonableness.
- Identifies the attributes of triangular and rectangular prisms (e.g., edges, faces, vertices).
- Identifies the degrees on a circle.
- Plots the location of an ordered pair in the first quadrant.
- Identifies correct unit (customary or metric) to the measurement situation.
- Determines the area of complex shapes composed of rectangles and squares (e.g., area of a room and closet).
- Identifies models that represent two operations (e.g., words, graphs, tables).
- Identifies symbolic representations of the associative property.
- Evaluates numerical expressions using order of operations.
- Evaluates simple algebraic expressions (addition, subtraction, multiplication).
- Solves one-step multiplication equations.
- Draws conclusions on the same set of data in different formats (tables, pictographs, bar graphs, line graphs).
- Identifies a list of possible outcomes for a simple event.
- Describes the likelihood of a possible event.

Nebraska State Accountability-Mathematics (NeSA-M) Performance Level Descriptor

Grade 6

Below the Standards

Overall student performance in mathematics reflects *unsatisfactory* performance on the standards and *insufficient* understanding of the content at sixth grade. A student scoring at the Below the Standards level *inconsistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***inconsistently***:

- Compares integers.
- Represents numbers using limited notation (factor trees, expanded form with exponents).
- Identifies representations of addition and subtraction of fractions and decimals (e.g., word, symbols).
- Multiplies and divides positive rational numbers.
- Selects appropriate computation when problem solving.
- Estimates problems involving whole numbers.
- Determines area of parallelograms.
- Identifies two-dimensional drawings of three-dimensional objects (e.g., prism, cone, sphere).
- Identifies transformed shapes (e.g., translation).
- Describes situations using algebraic expressions and equations (e.g., words).
- Evaluates numerical expressions using order of operations with two operations.
- Evaluates simple algebraic expressions (e.g., multiplication, division).
- Solves one-step equations with addition and subtraction.
- Compares and interprets data sets (frequency distribution).
- Finds and compares measures of central tendency from two data sets (e.g., mean, median).
- Computes theoretical probabilities for independent events.
- Finds experimental probabilities for independent events.

Meets the Standards

Overall student performance in mathematics reflects *satisfactory* performance on the standards and *sufficient* understanding of the content at sixth grade. A student scoring at the Meets the Standards level *generally* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***generally***:

- Compares and orders integers.
- Represents numbers using a variety of notations (e.g., exponential, prime factorization).
- Identifies representations of addition and subtraction of fractions and decimals (e.g., word, symbols).
- Multiplies and divides positive rational numbers.
- Selects and applies appropriate computation when problem solving.
- Estimates problems involving positive rational numbers.
- Determines area of parallelograms and triangles.
- Identifies two-dimensional drawings of three-dimensional objects.
- Identifies transformed shapes (e.g., translation).
- Describes situations using algebraic expressions and equations (e.g., words).
- Evaluates numerical expressions using order of operations.
- Evaluates simple algebraic expressions (e.g., multiplication, division).
- Solves one-step equations.
- Compares and interprets data sets (e.g., stem and leaf plots, frequency distribution).
- Finds and compares measures of central tendency from two data sets (e.g., mean, median).
- Computes theoretical probabilities for independent events.
- Finds experimental probabilities for independent events.

Exceeds the Standards

Overall student performance in mathematics reflects *high academic* performance on the standards and a *thorough* understanding of the content at or above sixth grade. A student scoring at the Exceeds the Standards level *consistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***consistently***:

- Compares and orders integers.
- Represents numbers as prime factorization with exponents.
- Identifies representations for addition and subtraction of fractions and decimals (e.g., pictures).
- Multiplies and divides positive rational numbers (e.g., mixed numbers).
- Selects and applies appropriate computation when solving multiple-step problems.
- Estimates problems involving positive rational numbers and analyzes the reasonableness.
- Determines area of special parallelograms and triangles (e.g., rhombus, right triangles, obtuse triangles).
- Identifies two-dimensional drawings of three-dimensional objects (e.g., nets).
- Identifies transformed shapes (e.g., reflection, rotation).
- Describes situations using algebraic expressions and equations (e.g., tables).
- Evaluates numerical expressions using order of operations (e.g., exponents, parentheses).
- Evaluates simple algebraic expressions involving multiple operations.
- Identifies steps in solving one-step equations.
- Compares and interprets data sets (e.g., stem and leaf plots).
- Determines appropriate measure of central tendency when comparing two data sets.
- Compares theoretical and experimental probabilities for independent events.

Nebraska State Accountability-Mathematics (NeSA-M) Performance Level Descriptor
Grade 7

Below the Standards

Overall student performance in mathematics reflects *unsatisfactory* performance on the standards and *insufficient* understanding of the content at seventh grade. A student scoring at the Below the Standards level *inconsistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***inconsistently***:

- Compares and orders rational numbers (decimals).
- Represents large numbers using scientific notation.
- Computes with integers (single operation).
- Selects and applies appropriate methods of computation when problem solving (integers).
- Estimates solutions to problems involving integers.
- Finds horizontal and vertical distances between ordered pairs given a graph.
- Identifies positions and orientations of transformed shapes (e.g., translation).
- Determines the area and circumference of circles.
- Describes situations using algebraic expressions and equations (e.g., words).
- Uses a variable to describe a situation with an inequality.
- Models contextualized problems using expressions.
- Evaluates algebraic expressions with two operations.
- Solves two-step equations involving integers.
- Solves one-step inequalities using whole numbers.
- Analyzes data sets and interprets their graphical representations.
- Finds and interprets measures of central tendency from two data sets (e.g., mean, median).
- Finds the probability of independent compound events.
- Compares and contrasts theoretical and experimental probabilities.

Meets the Standards

Overall student performance in mathematics reflects *satisfactory* performance on the standards and *sufficient* understanding of the content at seventh grade. A student scoring at the Meets the Standards level *generally* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***generally***:

- Compares and orders rational numbers (e.g., fractions, decimals, percents).
- Represents large numbers using scientific notation.
- Computes with integers (single operation).
- Selects and applies appropriate methods of computation when problem solving (e.g., integers and positive rational numbers).
- Estimates solutions to problems involving integers and positive rational numbers.
- Finds horizontal and vertical distances between ordered pairs given a graph.
- Identifies positions and orientations of transformed shapes (e.g., translation).
- Determines the area of trapezoids and circles and circumference of circles.
- Describes situations using algebraic expressions and equations (e.g., words).
- Uses a variable to describe a situation with an inequality.
- Models contextualized problems using expressions and equations.
- Evaluates algebraic expressions using the order of operations, given a value for a variable.
- Solves two-step equations involving integers and positive rational numbers.
- Solves one step inequalities using positive rational numbers.
- Analyzes data sets and interprets their graphical representations.
- Finds and interprets measures of central tendency from two data sets (e.g., mean, median).
- Finds the probability of independent compound events.
- Compares and contrasts theoretical and experimental probabilities.

Exceeds the Standards

Overall student performance in mathematics reflects *high academic* performance on the standards and a *thorough* understanding of the content at or above seventh grade. A student scoring at the Exceeds the Standards level *consistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***consistently***:

- Compares and orders rational numbers with combinations of fractions, decimals and percents.
- Represents large numbers using scientific notation.
- Computes with integers (multiple operations).
- Selects and applies appropriate methods of computation when solving multi-step problems (e.g., integers and positive rational numbers).
- Estimates solutions to problems involving integers and positive rational numbers and analyzes the reasonableness.
- Finds horizontal and vertical distances between ordered pairs given the ordered pairs.
- Identifies positions and orientations of transformed shapes (e.g., reflection, rotation).
- Determines the area of trapezoids and circles and circumference of circles.
- Describes situations using algebraic expressions and equations (e.g., tables, graphs).
- Uses a variable to describe a situation with an inequality (e.g., using “at least”, “at most”).
- Models contextualized problems using expressions and equations.
- Evaluates algebraic expressions using the order of operations (e.g., exponents and parentheses), given a value for a variable.
- Solves two-step equations involving integers and positive rational numbers.
- Solves one-step inequalities using positive rational numbers.
- Analyzes data sets and interprets their graphical representations.
- Determines appropriate measures of central tendency when comparing two data sets.
- Finds the probability of independent compound events.
- Compares and contrasts theoretical and experimental probabilities.

Nebraska State Accountability-Mathematics (NeSA-Mathematics) Performance Level Descriptor
Grade 8

Below the Standards

Overall student performance in mathematics reflects *unsatisfactory* performance on the standards and *insufficient* understanding of the content at eighth grade. A student scoring at the Below the Standards level *inconsistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***inconsistently***:

- Compares and orders rational numbers (fractions).
- Classifies real numbers as natural, whole, integer, and rational.
- Represents small numbers using scientific notation.
- Computes with rational numbers (like denominators).
- Evaluates absolute value of integers.
- Selects the method of computation when problem solving using rational numbers.
- Identifies the ratios and proportions used in solving problems
- Estimates solutions to problems involving rational numbers (like denominators).
- Represents and examines properties of squares using coordinate geometry.
- Identifies properties of parallel lines cut by a transversal (e.g., angle relationships).
- Identifies pairs of vertical angles.
- Determines missing interior angle measures within triangles when given two interior angles.
- Identifies right triangles using Pythagorean Theorem.
- Identifies similar shapes when given lengths.
- Describes situations using algebraic expressions and equations.
- Models contextualized problems using equations.
- Evaluates numerical expressions containing whole number exponents.
- Solves two-step equations involving rational numbers.
- Solves one-step inequalities involving rational numbers.
- Compares data characteristics (median, mode, range).
- Selects the most appropriate measure of central tendency.
- Identifies misrepresentation of circle graphs.
- Finds the probability of complementary events.
- Computes probabilities for independent compound events.

Meets the Standards

Overall student performance in mathematics reflects *satisfactory* performance on the standards and *sufficient* understanding of the content at eighth grade. A student scoring at the Meets the Standards level *generally* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***generally***:

- Compares and orders real numbers.
- Classifies real numbers as natural, whole, integer, rational, irrational.
- Represents small numbers using scientific notation.
- Computes with rational numbers (single operation).
- Evaluates expressions involving absolute value of integers (single operation).
- Selects the method of computation when problem solving using rational numbers.
- Solves problems involving ratios and proportions.
- Estimates solutions to problems involving rational numbers.
- Represents and examines properties of rectangles and squares using coordinate geometry.
- Identifies properties of parallel lines cut by a transversal (e.g., angle relationships).
- Identifies pairs of angles (e.g., vertical, supplementary, adjacent, complementary).
- Determines missing angle measures within triangles.
- Finds missing lengths in right triangles using the Pythagorean Theorem.
- Finds missing lengths in similar shapes.
- Describes situations using algebraic expressions, equations, and inequalities.
- Models contextualized problems using equations and inequalities.
- Evaluates numerical expressions containing whole number exponents.
- Solves multi-step equations involving rational numbers.
- Solves two-step inequalities involving rational numbers.
- Compares data characteristics (mean, median, mode, range).
- Selects the most appropriate measure of central tendency.
- Identifies misrepresentation of circle graphs and box plots.
- Finds the probability of complementary events.
- Computes probabilities for independent compound events.

Exceeds the Standards

Overall student performance in mathematics reflects *high academic* performance on the standards and a *thorough* understanding of the content at or above eighth grade. A student scoring at the Exceeds the Standards level *consistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***consistently***:

- Compares and orders combinations of various types of real numbers.
- Classifies real numbers as natural, whole, integer, rational, irrational.
- Represents small numbers using scientific notation.
- Computes with rational numbers (multiple operations).
- Evaluates expressions involving absolute value of integers (multiple operations).
- Selects and applies appropriate methods of computation when solving multi-step problems using rational numbers.
- Solves problems involving ratios and proportions.
- Estimates solutions to problems involving rational numbers and analyzes the reasonableness.
- Represents and examines properties of rectangles and squares using coordinate geometry.
- Identifies properties of parallel lines cut by a transversal (more than three lines).
- Identifies pairs of angles (e.g., vertical, supplementary, adjacent, complementary with three or more lines).
- Determines missing angle measures within special types of triangles.
- Finds missing lengths in right triangles using the Pythagorean Theorem.
- Finds missing lengths in similar shapes.
- Describes situations using algebraic expressions, equations, and inequalities.
- Models contextualized problems using equations and inequalities.
- Evaluates rational numerical expressions containing whole number exponents.
- Solves multi-step equations involving rational numbers.
- Solves two-step inequalities involving rational numbers.
- Analyzes data characteristics (mean, median, mode, range).
- Selects the most appropriate measure of central tendency.
- Identifies misinterpretation of circle graphs and box plots.
- Finds the probability of complementary events.
- Computes probabilities for independent compound events.

Nebraska State Accountability-Mathematics (NeSA-M) Performance Level Descriptor
Grade 11

Below the Standards

Overall student performance in mathematics reflects *unsatisfactory* performance on the standards and *insufficient* understanding of the content at eleventh grade. A student scoring at the Below the Standards level *inconsistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***inconsistently***:

- Computes rational numbers.
- Simplifies exponential expressions without denominators.
- Estimates solutions to problems involving rational numbers.
- Identifies and applies right triangle properties (e.g., Pythagorean Theorem).
- Applies the distance formula (given the graph).
- Uses coordinate geometry to analyze geometric situations.
- Proves special types of triangles and quadrilaterals (given a graph).
- Applies geometric properties and models to solve problems.
- Converts equivalent rates (single conversions).
- Identifies characteristics of linear functions.
- Converts among representations of functions (e.g., graphs, tables, equations).
- Identifies the slope and intercepts of a linear relationship from a graph.
- Identifies equivalent forms of linear equations.
- Models a situation involving a one-variable inequality.
- Simplifies algebraic expressions involving exponents.
- Adds and subtracts polynomials.
- Multiplies polynomials.
- Determines the outliers of a data set.
- Identifies independent and dependent events.
- Calculates probability of independent events.
- Uses the appropriate counting techniques to determine the probability of an event.
- Analyzes events to determine if they are mutually exclusive.

Meets the Standards

Overall student performance in mathematics reflects *satisfactory* performance on the standards and *sufficient* understanding of the content at eleventh grade. A student scoring at the Meets the Standards level *generally* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***generally***:

- Computes real numbers.
- Simplifies exponential expressions.
- Estimates solutions to problems involving real numbers.
- Identifies and applies right triangle properties (e.g., Pythagorean Theorem).
- Applies the distance formula (given the graph).
- Uses coordinate geometry to analyze geometric situations.
- Proves special types of triangles and quadrilaterals (given a graph).
- Applies geometric properties and models to solve problems.
- Converts equivalent rates (single conversions).
- Identifies characteristics of linear and non-linear functions.
- Converts among representations of functions (e.g., graphs, tables, equations).
- Identifies the slope (rate of change) and intercepts of a linear relationship from a graph.
- Identifies equivalent forms of linear equations.
- Models a situation involving a one-variable inequality.
- Simplifies algebraic expressions involving exponents.
- Adds and subtracts polynomials.
- Multiplies and divides polynomials (dividing by monomials).
- Determines the spread (variance, standard deviation) and outliers of a data set.
- Identifies independent and dependent events.
- Calculates probability of independent events.
- Uses the appropriate counting techniques to determine the probability of an event.
- Analyzes events to determine if they are mutually exclusive.

Exceeds the Standards

Overall student performance in mathematics reflects *high academic* performance on the standards and a *thorough* understanding of the content at or above eleventh grade. A student scoring at the Exceeds the Standards level *consistently* draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.

A student at this level ***consistently***:

- Computes real numbers.
- Simplifies exponential expressions.
- Estimates solutions to problems involving real numbers and analyzes the reasonableness.
- Identifies and applies right triangle properties (e.g., sine, cosine, tangent).
- Applies the distance formula (given ordered pairs).
- Uses coordinate geometry to analyze geometric situations.
- Proves special types of triangles and quadrilaterals (given an ordered pair).
- Applies geometric properties and models to solve problems.
- Converts equivalent rates (multiple conversions).
- Identifies characteristics of linear and non-linear functions.
- Converts among representations of functions (e.g., graphs, tables, equations).
- Identifies the slope (rate of change) and intercepts of a linear relationship from an equation, ordered pairs, or tables.
- Identifies equivalent forms of linear equations.
- Models a situation involving a one-variable inequality (e.g., $x > -5$ and $x < 1$).
- Simplifies algebraic expressions involving exponents.
- Adds and subtracts polynomials.
- Multiplies and divides polynomials (dividing by binomial).
- Determines the shape (normal/skewness) of a data set.
- Identifies independent and dependent events.
- Calculates probability of dependent events.
- Uses the appropriate counting techniques to determine the probability of an event.
- Analyzes events to determine if they are mutually exclusive.

Appendix B: Meeting Agenda

Appendix B.1 Agenda

NeSA-Mathematics

Nebraska Bookmark Standard Setting Meeting

Sunday June 26, 2011

Hotel Check-in for those traveling long distances

Monday June 27, 2011 *(times are approximate depending on work completion)*

8:00 – 8:30 Breakfast and Check-in
8:30 – 10:30 Training in Large Group in Room E/F
10:35 – 12:00 Grade Group Breakouts

Mathematics Grade	*Teachers who teach*	*Room*
4	*Grades 3, 4, 5*	*D*
7	*Grades 6, 7, 8*	*B*
11	*Grades 10, 11, 12, HE*	*C*

12:00 – 1:00 Lunch in Lancaster 4, 5, 6
1:00 – Completion Complete work for first Grade Group

Tuesday June 28, 2011 *(times are approximate depending on work completion)*

8:00 – 8:30 Breakfast and Check-in
8:30 – 9:00 Review Monday in Large Group Room E/F
9:00– 12:00 Meeting in Small Groups by Grade

Mathematics Grade	*Teachers who teach*	*Room*
3	*Grades 3, 4, 5*	*D*
8	*Grades 6, 7, 8, and 10 +*	*B/C*

12:00 – 1:00 Lunch in Lancaster 4, 5, 6
1:00 – Completion Continue in Small Groups by Grade

Wednesday June 29, 2011 *(times are approximate depending on work completion)*

8:00 – 8:30 Breakfast and Check-in
8:30 – 9:00 Review Tuesday in Large Group Room E/F
9:00 – 12:00 Meeting in Small Group for grades 5 and 6

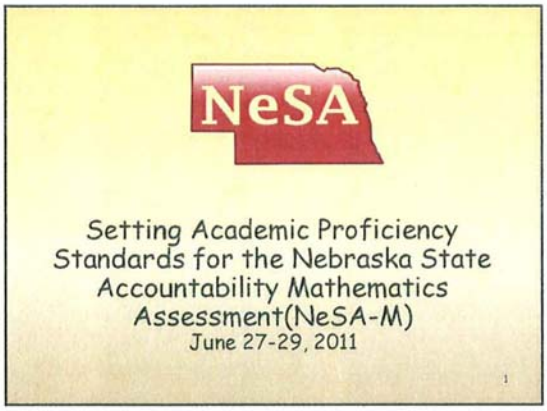
Grade	*Teachers who teach*	*Room*
5	*3, 4, 5*	*A/B*
6	*6, 7, 8*	*C*

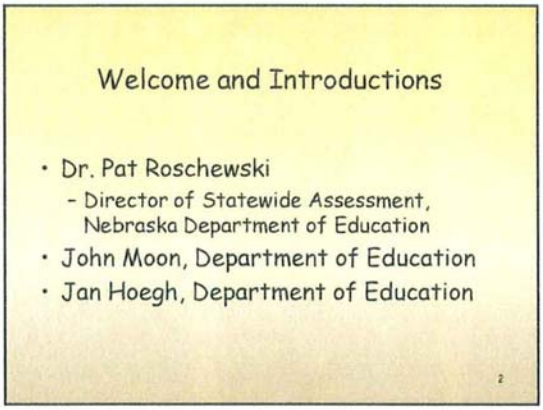
12:00 – 1:00 Lunch in Lancaster 4, 5, 6
1:00 – Completion Continue in Small Groups

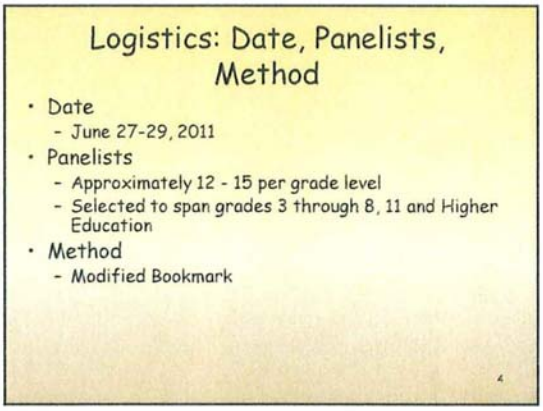
Appendix B.2: Groupings and Room Assignments

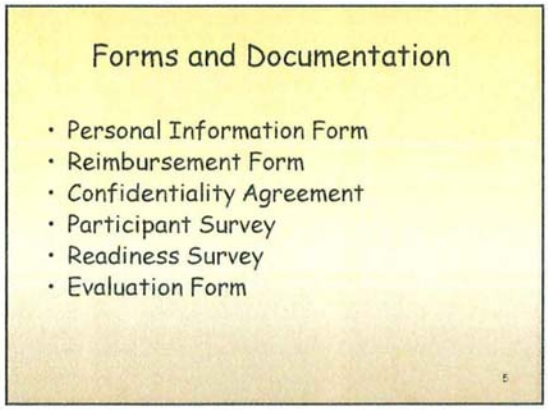
Math	Monday			Tuesday		Wednesday	
June 28-30, 2010	Room 1 (room for 45)	Room 2 (room for 45)	Room 3 (room for 30)	Room 1 (room for 45)	Room 2 (room for 60)	Room 1 (room for 45)	Room 2 (room for 45)
8:00 AM	Breakfast			Breakfast		Breakfast	
8:15 AM							
8:30 AM	Training Large Group			Presentation of Results from previous day		Final discussion	
8:45 AM							
9:00 AM						**Grade 5**	**Grade 6**
9:15 AM						Take Test	Take Test
9:30 AM				**Grade 3**	**Grade 8**	PLD Review	PLD Review
9:45 AM				Take test	Take test		
10:00 AM							
10:15 AM				PLD review	PLD review	R1 OIB review and Bookmark Placement	
10:30 AM	Move to grade level rooms						
10:45 AM	**Grade 4**	**Grade 7**	**Grade 11**				
11:00 AM	Take test	Take test	Take test	R1 OIB review and Bookmark Placement		Break and Analysis	
11:15 AM	PLD review	PLD review	PLD review			R1 Feedback and Discussion	
11:30 AM							
11:45 AM						R2 bookmark Adjustments	
12:00 PM	Lunch and Analysis			Lunch and Analysis			
12:15 PM							
12:30 PM						Lunch and Analysis	
12:45 PM							
1:00 PM	R1 OIB review and			R1 Feedback and Discussion			
1:15 PM	Bookmark placement						
1:30 PM						R2 Feedback and Discussion adding Contrasting Group data	
1:45 PM							
2:00 PM	Break and Analysis			R2 Bookmark Adjustments		R3	
2:15 PM	R1 Feedback and Discussion						
2:30 PM							
2:45 PM							
3:00 PM		R2		Break and Analysis			
3:15 PM	Bookmark Adjustments			R2 Feedback and Discussion Adding in Contrasting Groups, and NAEP data as available for Grade 8			
3:30 PM							
3:45 PM	Break and Analysis						
4:00 PM	R2 Feedback and Discussion						
4:15 PM	Adding in Contrasting Groups, NAEP and ACT data as available			R3			
4:30 PM							
4:45 PM							
5:00 PM		R3					

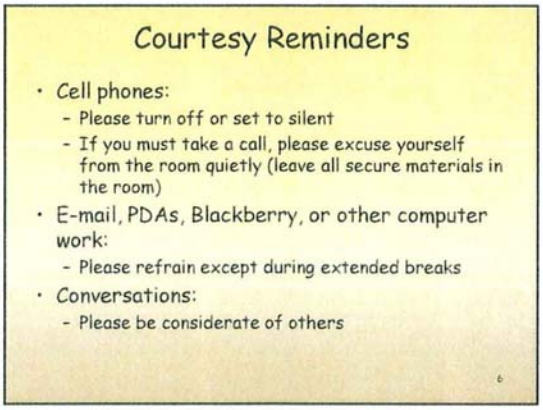
Appendix C: PowerPoint: Setting Academic Proficiency Standards











Purpose of the Meeting

- To recommend NeSA-M cutscores that categorize students into one of three performance levels:
  - Exceeds the Standards
  - Meets the Standards
  - Below the Standards
- To articulate these expectations across grades 3 through 8 and 11

7

Schedule

- Monday:
  - Grade 4 (panelists from grades 3, 4, 5)
  - Grade 7 (panelists from grades 6, 7, 8)
  - Grade 11 (panelists from grades 10, 11, 12 and Higher Education)

8

Schedule

- Tuesday:
  - Review results from end-of-day Monday
  - Grade 3 (panelists from grades 3, 4, 5)
  - Grade 8 (panelists from grades 6, 7, 8, 10+)

9

Schedule

- Wednesday:
  - Review results from end-of-day Tuesday
  - Grade 5 (panelists from grades 3, 4, 5)
  - Grade 6 (panelists from grades 6, 7, 8)

10

Methodology

Modified Bookmark

- One in a broad category of methods commonly referred to as item mapping that focuses on items rather than examinees
- Places emphasis on what a student should know and be able to do

11

Step 1: How do students demonstrate their proficiency?

- Take the test
  - Provides panelists a feel for students' testing experience on the operational administration of the NeSA Mathematics

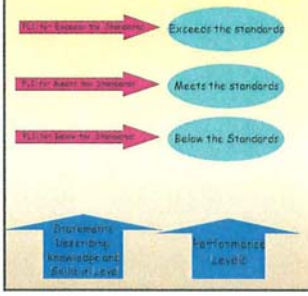
12

Step 2: What do the performance levels mean?

- Performance Level Descriptors (PLDs) are:
  - Statements that describe the knowledge and skills expected at each of the three achievement levels
  - Unique to each grade and subject
  - **Middle** of the level; not the borderline students

13

The Relationships Between PLDS and Performance Levels



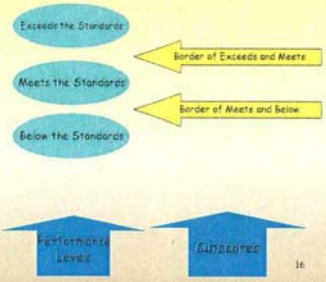
14

Step 3: What Defines Borderline Students?

- Visualize Nebraska students who are:
  - Just barely leaving one level, and
  - Just barely entering the next higher level

15

The Relationships Between Performance Levels and Cutscores



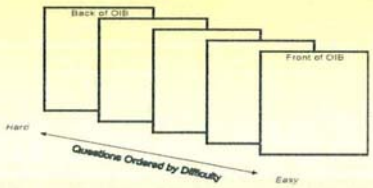
16

Step 4: What are we expected to do?

- Panelists are presented with operational test questions ordered from easiest to most difficult

17

Ordered Item Booklet (OIB)



- Based on Spring 2011 data

18

Step 5: Where do we draw the line?

- Panelists are asked to make judgments about which items students at the borderline between two performance levels are able to get correct and which ones they are not.
  - Criterion: "67 or more out of 100"
- Place the "bookmark" on the first item that does **not** meet the criterion.

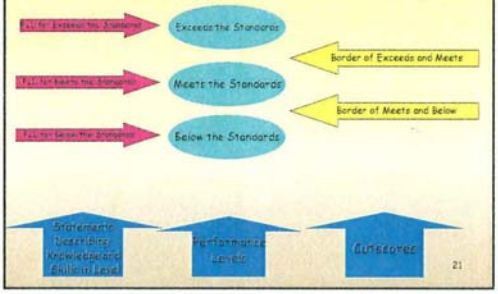
19

What happens to our bookmarks?

- These collective judgments determine the recommended cutscores that separate:
  - ***Meets the Standards*** students from ***Below the Standards*** students
  - ***Exceeds the Standards*** students from ***Meets the Standards*** students

20

The Relationships Among PLDs, Performance Levels, and Cutscores



21

Overview of Process

- Three rounds of individual judgments
  - Group discussions
  - Opportunities to revise judgments
  - Data will be presented at the beginning of Rounds 2 and 3
    - For example, the percent of students that would fall into each of the three performance levels based on the group recommendation from the previous round

22

Articulation Across Grades: The Process

- Results from Rounds 1, 2, and 3 will be presented for all grades as they become available
- NAEP results for Nebraska students in 2009 from grades 4 and 8 will be presented in the associated grades
  - After Round 2
- ACT College Readiness scores will be presented for grade 11
  - After Round 2

23

Articulation Across Grades: The Process (cont.)

- Contrasting Groups results will be presented for grades 3 through 8 and 11
  - Participation from educators across the state
  - Used educator placements of students in their classrooms and NeSA results to determine cutscores
  - After Round 2

24

Panelists' Roles and Responsibilities

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

26

Outcomes

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

26

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 discussion related to any of the secure materials outside of the rooms, including breaks, lunch, and dinner
- Check out
  - Turn in materials at the end of each day.
  - Materials will be returned to you at the start of each day

27

Return Times

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

28

Training Materials

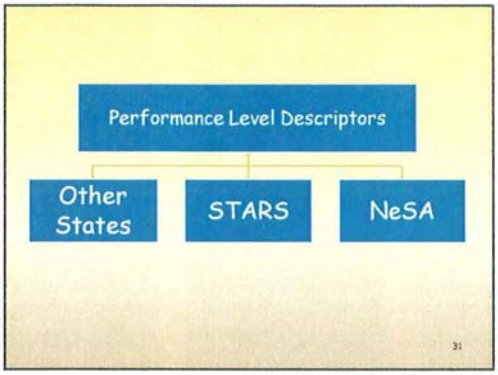
- Sample:
  - NeSA-M Performance Level Descriptors (grade 6 mathematics)
  - Five items (grade 6 mathematics)
  - Item Map
  - Item Separation Chart
  - Participant Rating Form
  - Results

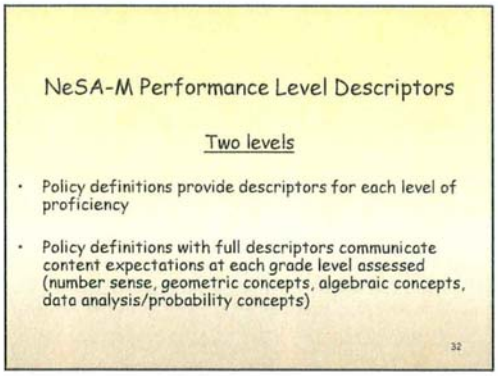
29

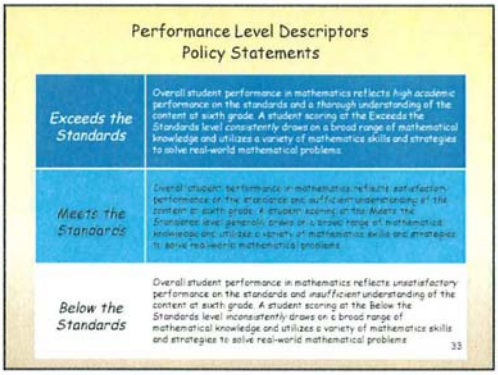
Performance Level Descriptors

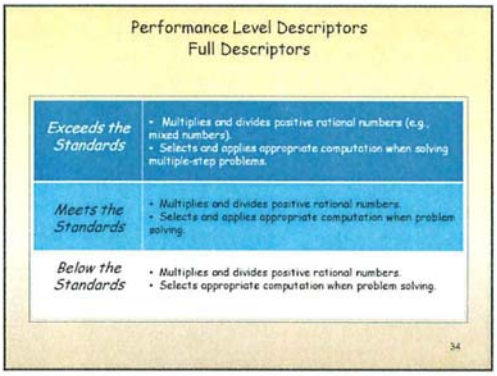
- Performance level descriptors (PLD's) describe the level of knowledge and skills required at each performance level.
  - Below the Standards
  - Meets the Standards
  - Exceeds the Standards

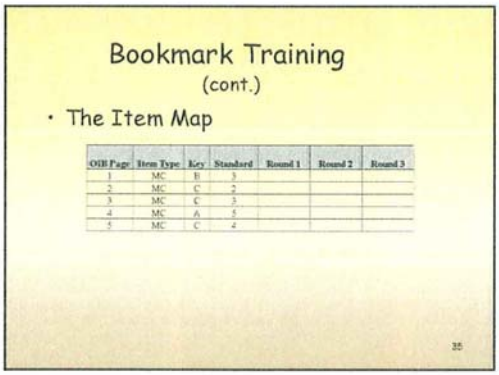
30

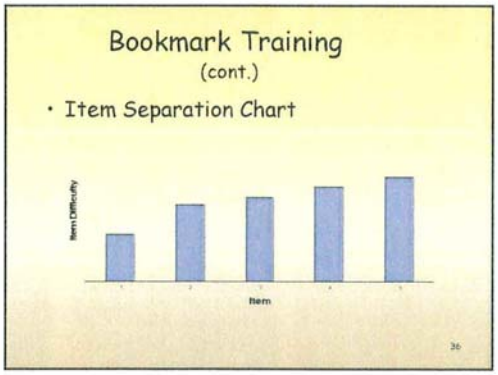

Performance Level Descriptors
Other States
STARS
NeSA
31


NeSA-M Performance Level Descriptors
Two levels
• Policy definitions provide descriptors for each level of proficiency
• Policy definitions with full descriptors communicate content expectations at each grade level assessed (number sense, geometric concepts, algebraic concepts, data analysis/probability concepts)
32


Performance Level Descriptors
Policy Statements
Exceeds the Standards
Overall student performance in mathematics reflects high academic performance on the standards and a thorough understanding of the content at sixth grade. A student scoring at the Exceeds the Standards level consistently draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.
Meets the Standards
Overall student performance in mathematics reflects satisfactory performance on the standards and sufficient understanding of the content at sixth grade. A student scoring at the Meets the Standards level generally draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.
Below the Standards
Overall student performance in mathematics reflects unsatisfactory performance on the standards and insufficient understanding of the content at sixth grade. A student scoring at the Below the Standards level inconsistently draws on a broad range of mathematical knowledge and utilizes a variety of mathematics skills and strategies to solve real-world mathematical problems.
33


Performance Level Descriptors
Full Descriptors
Exceeds the Standards
• Multiplies and divides positive rational numbers (e.g., mixed numbers).
• Selects and applies appropriate computation when solving multiple-step problems.
Meets the Standards
• Multiplies and divides positive rational numbers.
• Selects and applies appropriate computation when problem solving.
Below the Standards
• Multiplies and divides positive rational numbers.
• Selects appropriate computation when problem solving.
34


Bookmark Training
(cont.)
• The Item Map
OIB Page
Item Type
Key
Standard
Round 1
Round 2
Round 3
1 MC B 3
2 MC C 2
3 MC C 3
4 MC A 5
5 MC C 4
35


Bookmark Training
(cont.)
• Item Separation Chart
Item Difficulty
Item
36

Placing the Bookmark: The Region of Uncertainty

- Identify ***groups*** of items that are probable choices based on your judgment
- Do not focus on a single item
- Utilize the "item separation chart"

37

Bookmark Training (cont.)

- Participant Rating Form
  - For the formal part of the meeting, two bookmarks will be placed in the OIB
    - 1st: Below the Standards/Meets the Standards
    - 2nd: Meets the Standards/Exceeds the standards

38

39

Training (cont.)

- Placing a Bookmark
  - Go through the OIB page by page and assess whether a borderline ***Meets the Standards*** student, according to the PLDs, has a sufficient probability of answering each item correctly
    - For multiple-choice (MC) items, ***sufficient*** is .67

40

Training (cont.)

- Does a borderline **Meets the Standards** student have at least a .67 probability of answering this item correctly?
- If yes, turn the page and make the same judgment about the next most difficult item

41

Training (cont.)

- Continue until you reach an item that the borderline ***Meets the standards*** student would **not** have a .67 chance of answering correctly
- ***Key Point***
  - Place your post-it bookmark on this page, which represents the first item that the borderline student would **not** answer correctly 67 percent of the time
    - ***Reminder:*** Region of Uncertainty!
  - Record this page number on your Rating Form

42

Practice Exercise

43

Practice Steps

- Review the five sample mathematcis questions
- Review the NeSA-M PLDs for Meets the Standards and Below the Standards
- Visualize a student just barely out of the Below the Standards level and just barely into the Meets the Standards level
- Indicate on the Sample Rating Form the first item you judge your borderline student would get correct ***less*** than 67 percent of the time

44

Done?

45

Show of Hands!

46

Sample Results

		Round 1		Round 2		Round 3	
ID	Table	Meets	Exceeds	Meets	Exceeds	Meets	Exceeds
1	1	22	36	26	41	27	42
2	1	20	37	27	41	28	41
3	1	22	39	30	40	31	40
4	1	20	38	31	40	30	40
5	1	23	37	30	39	29	40
6	1	22	36	30	39	29	41
7	1	28	37	29	41	28	42
8	1	28	39	31	41	30	42
9	1	27	38	30	43	32	43
10	1	26	36	31	40	30	41

47

Sample Results (cont.)

Percent of Students in Performance Levels

48

Mathematics Results Across Grades

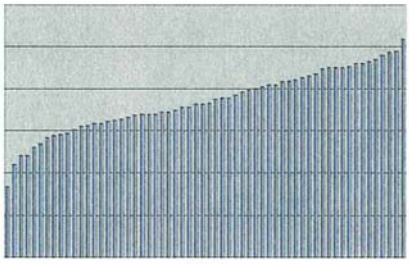
Percent of Students in Performance Levels

49

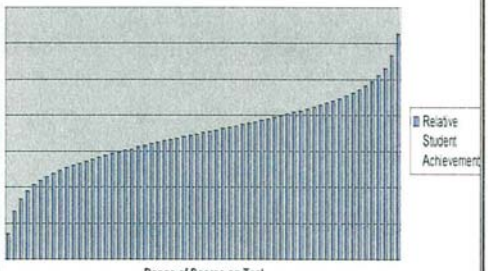
Psychometrics: An Introduction

50

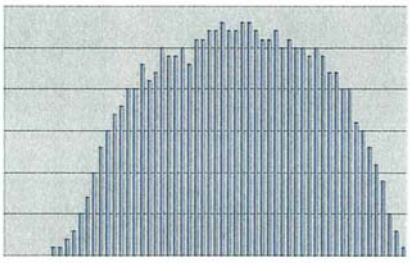
Item Separation Chart



Person Separation Chart



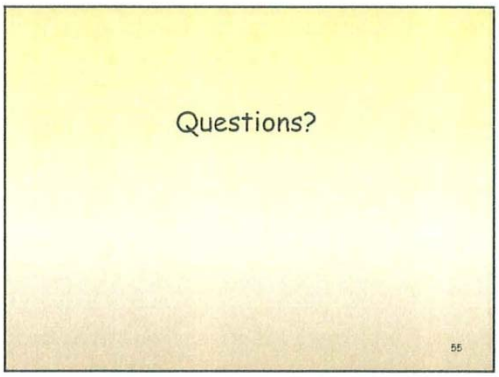
Student Score Distribution

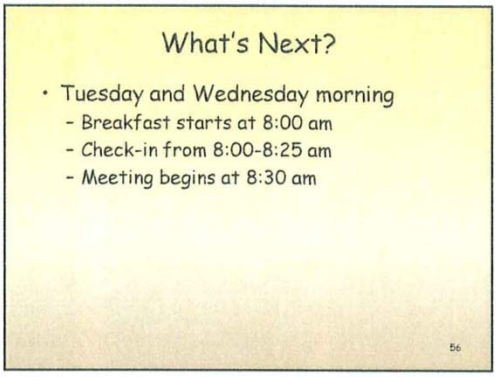


What You May And May Not Discuss Outside Of This Meeting

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

54

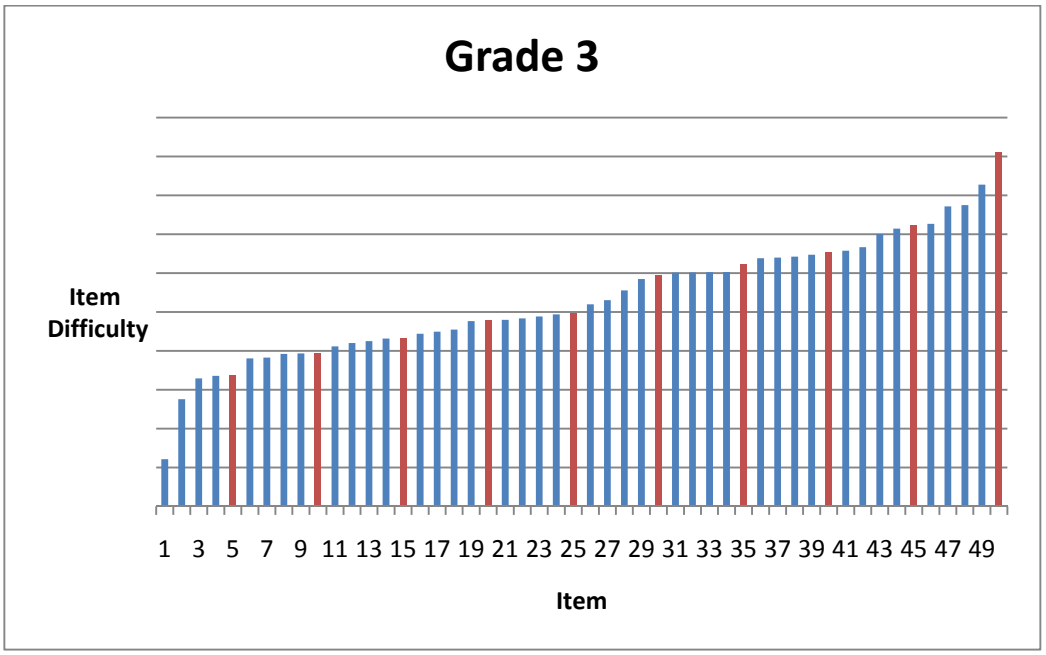

Questions?
55

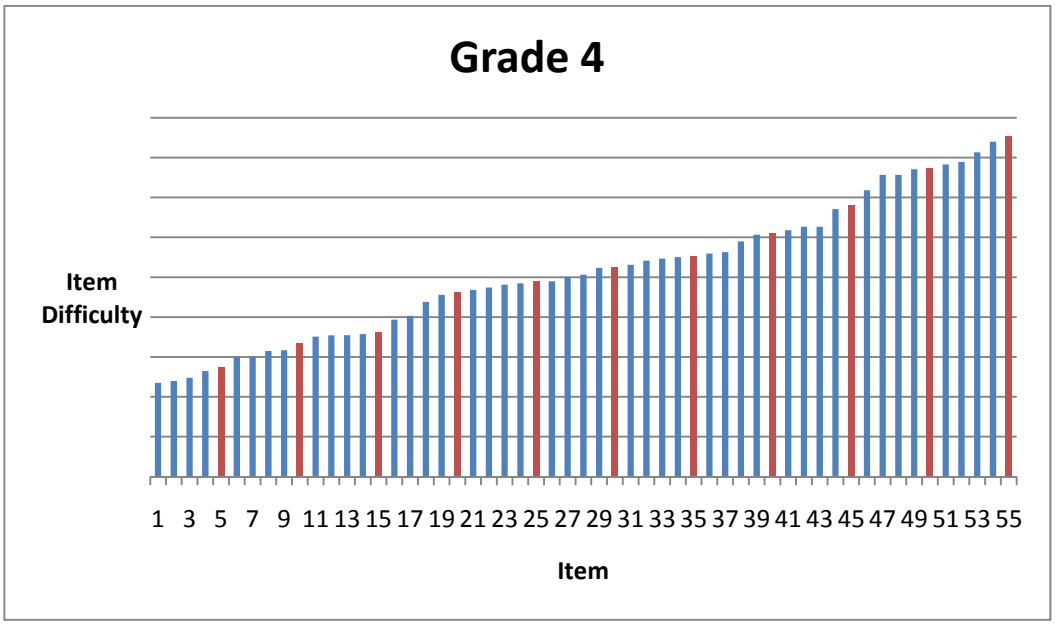

What's Next?
• Tuesday and Wednesday morning
- Breakfast starts at 8:00 am
- Check-in from 8:00-8:25 am
- Meeting begins at 8:30 am
56

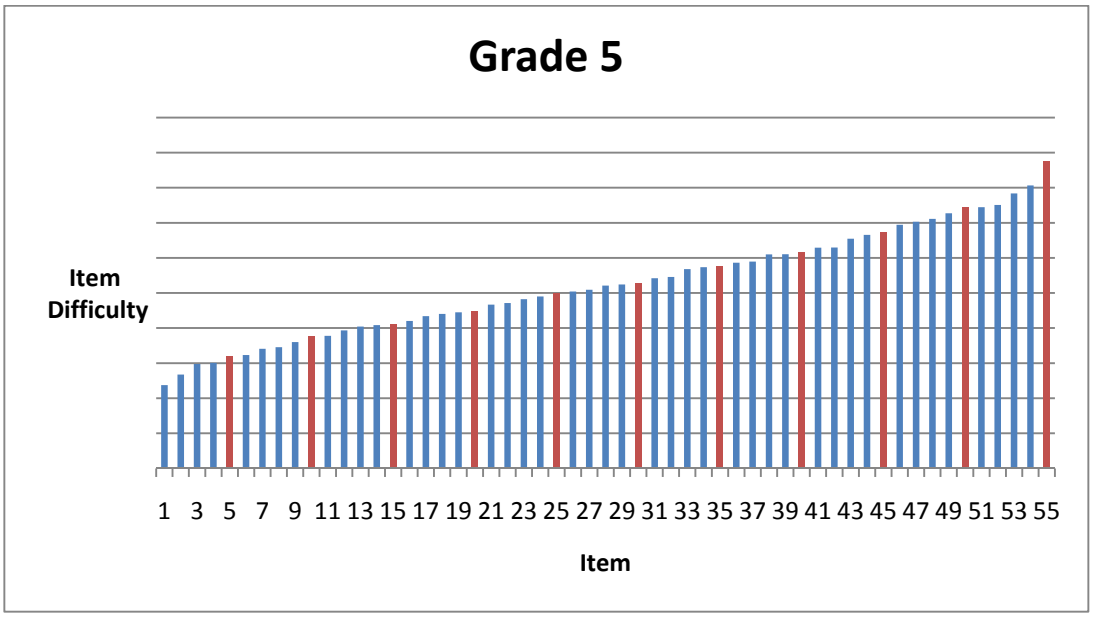
Appendix D: Impacts by Bookmark Round

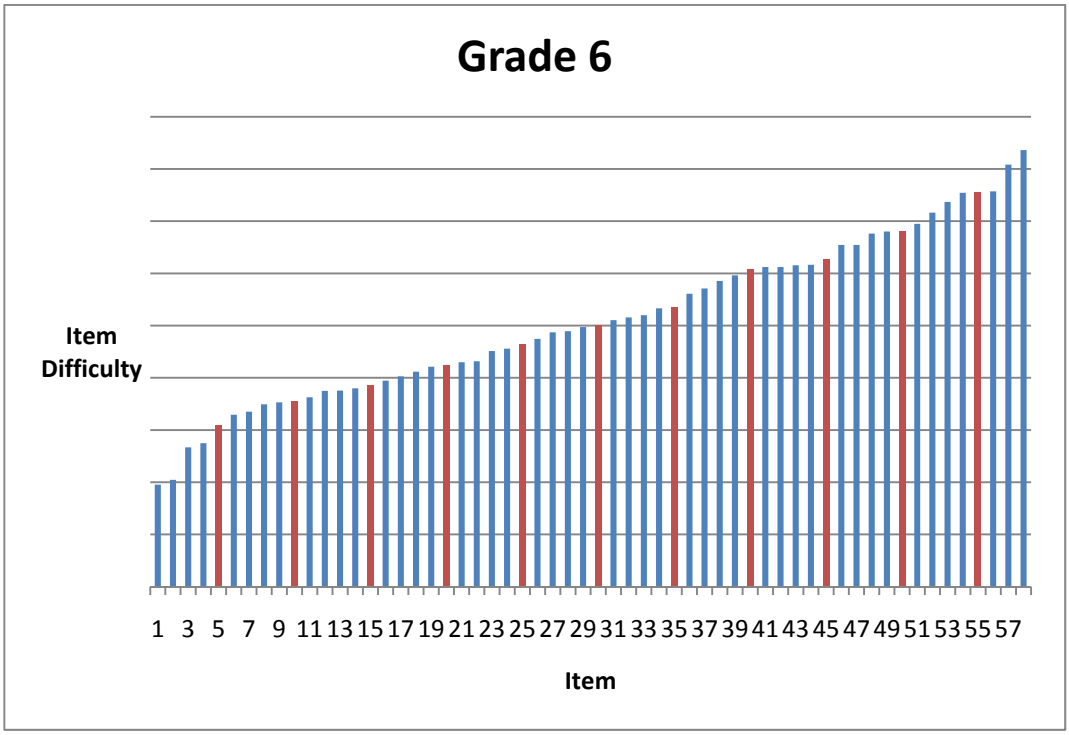
Reading	Below the Standards	Meets the Standards	Exceeds the Standards
Grade 3			
Round 1	24.6	24.6	50.8
Round 2	24.6	33.4	42.0
Round 3	22.3	35.7	42.0
Grade 4			
Round 1	13.1	28.9	58.0
Round 2	21.0	33.0	47.0
Round 3	20.5	36.4	43.1
Grade 5			
Round 1	22.8	37.8	39.4
Round 2	22.8	37.8	39.4
Round 3	22.8	37.8	39.4
Grade 6			
Round 1	16.5	26.6	56.9
Round 2	16.5	33.2	50.3
Round 3	18.0	31.7	50.3
Grade 7			
Round 1	26.3	27.1	46.6
Round 2	26.3	33.6	40.1
Round 3	26.3	33.6	40.1
Grade 8			
Round 1	24.3	24.3	51.4
Round 2	22.6	28.7	48.7
Round 3	22.6	31.4	46.0
Grade 11			
Round 1	44.1	10.3	45.6
Round 2	41.8	14.7	43.5
Round 3	37.8	21.0	41.2

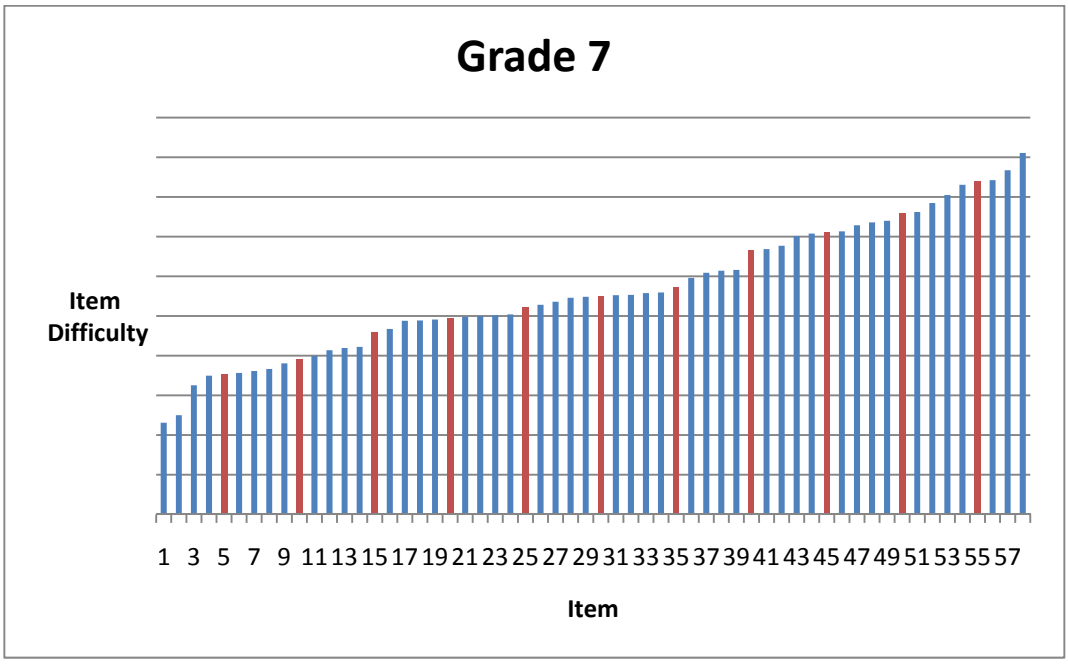
Appendix E: Item Separation Maps

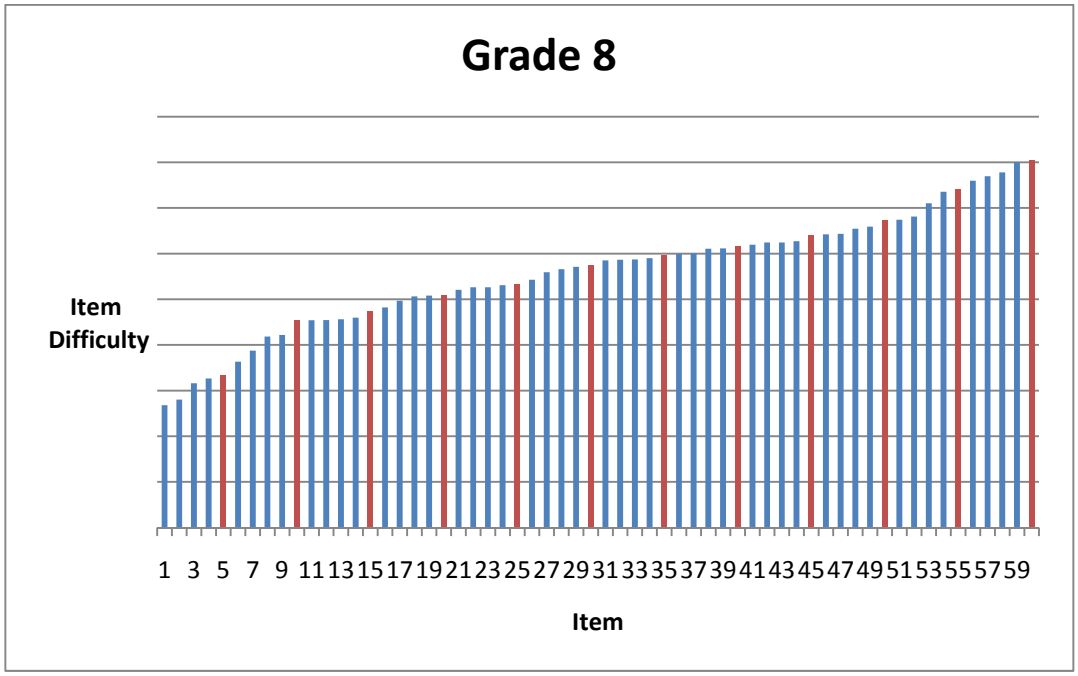


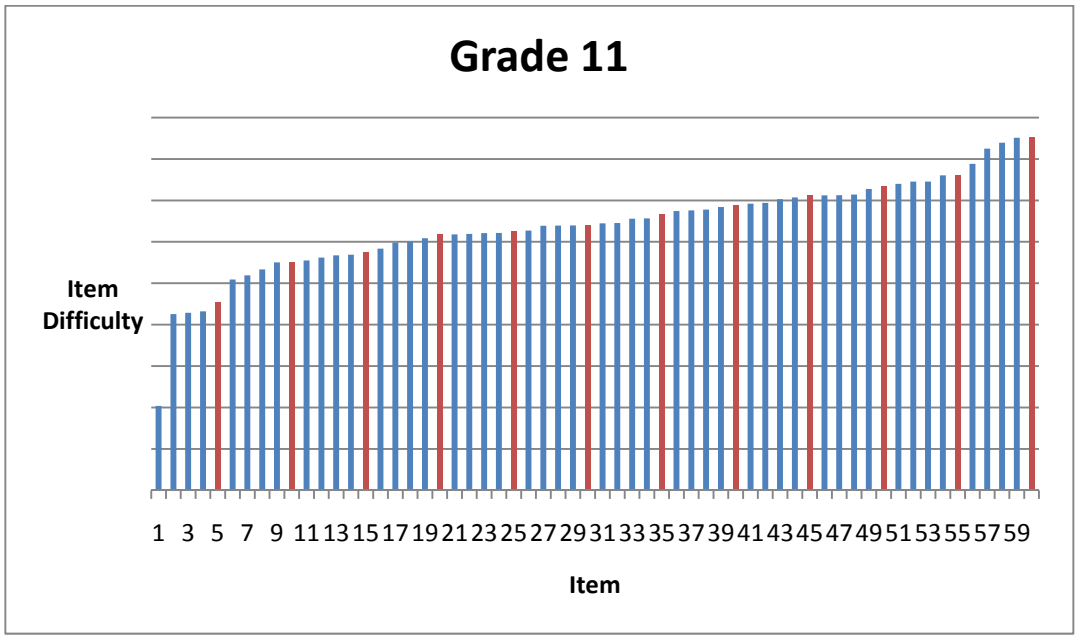



Grade 5
Item Difficulty
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55
Item


Grade 6
Item Difficulty
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57
Item


Grade 7
Item Difficulty
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57
Item


Grade 8
Item Difficulty
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59
Item


Grade 11
Item Difficulty
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59
Item

Appendix F: Contrasting Groups Summaries

Table F.1: Overall Contrasting Group Summary Data

2011 Mathematics Contrasting Groups Summary Data

Group	Grade 3		Grade 4		Grade 5		Grade 6		Grade 7		Grade 8		Grade 11	
	State	Teacher Rated	State	Teacher Rated	State	Teacher Rated	State	Teacher Rated	State	Teacher Rated	State	Teacher Rated	State	Teacher Rated
Student Count														
Overall	21929	1398	21604	2072	21391	1702	20860	2403	20694	2867	20552	2656	20855	3128
Gender														
Male	11099	711	10986	1026	10966	876	10650	1235	10649	1492	10535	1344	10621	1574
Female	10817	686	10582	1040	10402	826	10190	1167	10039	1375	10011	1312	10209	1553
Ethnicity														
American Indian	330	9	355	35	346	4	303	13	268	19	295	23	320	22
Asian	445	22	463	55	413	24	437	52	388	41	409	44	426	59
Black	1425	38	1489	63	1450	35	1344	95	1324	176	1289	167	1279	53
Hispanic	3829	135	3579	284	3504	129	3263	235	3160	272	3145	211	2606	278
Multiple	660	29	624	53	618	33	628	64	556	65	569	67	544	47
PI	29	3	26	2	19	1	25	5	25	3	24	2	29	8
White	15197	1161	15035	1574	15016	1476	14833	1938	14963	2291	14813	2142	15623	2660
Teacher Rating														
Below		402		630		458		705		1038		837		1053
Meets		711		1027		888		1242		1308		1291		1426
Exceeds		285		415		356		456		521		528		649
Performance Level														
Below	7171	322	7000	505	7294	371	7781	792	7967	950	8118	865	9593	1008
Meets	10921	761	11169	1117	10310	924	9241	1158	9374	1353	9146	1264	6840	1207
Exceeds	3838	315	3435	450	3786	407	3838	453	3352	564	3288	527	4421	913
Correlation														
Teacher Rating to Performance Level		0.609		0.595		0.601		0.619		0.665		0.664		0.647

Table F.2: Agreement between Teacher Ratings and Final Performance Level Status

Grade 3		Teacher Rank			
		Below	Meets	Exceeds	Total
Actual Performance	Below	232	87	3	322
	Meets	167	485	109	761
	Exceeds	3	139	173	315
Total		402	711	285	1398

Grade 4		Teacher Rank			
		Below	Meets	Exceeds	Total
Actual Performance	Below	356	144	5	505
	Meets	267	689	161	1117
	Exceeds	7	194	249	450
Total		630	1027	415	2072

Grade 5		Teacher Rank			
		Below	Meets	Exceeds	Total
Actual Performance	Below	265	101	5	371
	Meets	186	608	130	924
	Exceeds	7	179	221	407
Total		458	888	356	1702

Grade 6		Teacher Rank			
		Below	Meets	Exceeds	Total
Actual Performance	Below	515	265	12	792
	Meets	184	790	184	1158
	Exceeds	6	187	260	453
Total		705	1242	456	2403

Grade 7		Teacher Rank			
		Below	Meets	Exceeds	Total
Actual Performance	Below	743	203	4	950
	Meets	284	867	202	1353
	Exceeds	11	238	315	564
Total		1038	1308	521	2867

Grade 8		Teacher Rank			
		Below	Meets	Exceeds	Total
Actual Performance	Below	619	239	7	865
	Meets	215	848	201	1264
	Exceeds	3	204	320	527
Total		837	1291	528	2656

Grade 11		Teacher Rank			
		Below	Meets	Exceeds	Total
Actual Performance	Below	704	292	12	1008
	Meets	325	740	142	1207
	Exceeds	24	394	495	913
Total		1053	1426	649	3128

Appendix G: Contrasting Groups Analyses

Grade 3 Math Contrasting Groups

Number Correct	Logit Ability	Teacher Rating			Total	Meets to Below	Exceeds to Meets
		Below	Meets	Exceeds			
7	-3.372	1	0	0	1	0.00	
9	-3.049	1	0	0	1	0.00	
10	-2.907	2	0	0	2	0.00	
11	-2.775	1	0	0	1	0.00	
13	-2.533	2	0	0	2	0.00	
14	-2.420	4	0	0	4	0.00	
15	-2.312	4	0	0	4	0.00	
16	-2.208	3	0	0	3	0.00	
17	-2.107	1	0	0	1	0.00	
18	-2.008	10	0	0	10	0.03	0.00
19	-1.911	5	0	0	5	0.08	0.00
20	-1.816	14	1	0	15	0.06	0.00
21	-1.723	10	2	0	12	0.10	0.00
22	-1.631	12	0	0	12	0.11	0.00
23	-1.539	17	3	0	20	0.16	0.00
24	-1.448	8	1	0	9	0.16	0.00
25	-1.357	9	3	0	12	0.22	0.14
26	-1.266	18	3	0	21	0.25	0.13
27	-1.175	12	4	2	18	0.24	0.11
28	-1.083	18	5	0	23	0.30	0.08
29	-0.991	21	4	0	25	0.46	0.05
30	-0.897	15	9	0	24	0.51	0.00
31	-0.802	16	16	0	32	0.81	0.02
32	-0.705	16	10	0	26	1.07	0.03
33	-0.606	12	26	1	39	1.18	0.02
34	-0.504	14	17	1	32	1.41	0.05
35	-0.399	20	23	0	43	1.62	0.05
36	-0.290	17	35	3	55	1.58	0.07
37	-0.177	18	30	1	49	2.07	0.07
38	-0.059	17	31	5	53	2.41	0.11
39	0.066	9	49	2	60	2.61	0.13
40	0.199	17	43	10	70	2.92	0.17
41	0.341	14	43	7	64	3.55	0.22
42	0.496	17	50	13	80	3.64	0.28
43	0.666	9	49	20	78	4.67	0.34
44	0.856	10	59	18	87	6.52	0.45
45	1.074	5	56	29	90	10.48	0.58
46	1.333	1	60	42	103	13.22	0.67
47	1.656	0	38	44	82	24.25	0.88
48	2.097	2	25	27	54	46.33	1.24
49	2.825	0	15	29	44	20.50	2.12
50	4.054	0	1	31	32		31.00

Grade 4 Math Contrasting Groups

Number Correct	Logit Ability	Teacher Rating			Total	Meets to Below	Exceeds to Meets
		Below	Meets	Exceeds			
9	-3.352	1	0	0	1		
12	-2.955	3	1	0	4		
13	-2.837	1	0	0	1	0.08	0.00
14	-2.725	4	0	0	4	0.06	0.00
15	-2.618	3	0	0	3	0.00	
16	-2.515	5	0	0	5	0.00	
17	-2.415	2	0	0	2	0.00	
18	-2.317	2	0	0	2	0.14	0.00
19	-2.222	9	0	0	9	0.22	0.00
20	-2.129	3	3	0	6	0.26	0.11
21	-2.038	11	3	0	14	0.24	0.09
22	-1.948	9	3	1	13	0.29	0.07
23	-1.860	14	2	0	16	0.21	0.08
24	-1.772	11	3	0	14	0.22	0.08
25	-1.685	12	1	0	13	0.22	0.00
26	-1.598	14	4	0	18	0.27	0.05
27	-1.512	18	5	0	23	0.28	0.04
28	-1.426	16	6	1	23	0.34	0.03
29	-1.340	22	7	0	29	0.36	0.03
30	-1.253	16	7	0	23	0.37	0.03
31	-1.166	28	11	0	39	0.33	0.00
32	-1.078	24	8	0	32	0.41	0.02
33	-0.989	26	5	0	31	0.44	0.02
34	-0.898	18	15	1	34	0.60	0.01
35	-0.807	26	15	0	41	0.63	0.04
36	-0.713	26	29	0	55	0.78	0.04
37	-0.618	32	16	2	50	0.87	0.04
38	-0.520	27	26	1	54	1.07	0.07
39	-0.419	25	32	2	59	1.16	0.09
40	-0.315	26	42	5	73	1.43	0.08
41	-0.207	29	45	4	78	1.60	0.10
42	-0.094	33	55	3	91	1.72	0.10
43	0.024	28	51	8	87	1.94	0.10
44	0.149	22	44	3	69	2.43	0.15
45	0.281	25	71	9	105	3.10	0.17
46	0.424	11	68	19	98	4.01	0.22
47	0.578	11	67	13	91	4.53	0.29
48	0.748	10	67	26	103	6.21	0.39
49	0.938	15	53	28	96	6.87	0.49
50	1.155	5	68	40	113	8.44	0.61
51	1.414	5	61	47	113	10.65	0.79
52	1.736	1	55	45	101	20.75	1.02
53	2.176	0	40	59	99	27.71	1.28
54		1	25	64	90		
55		0	13	34	47		

Grade 5 Math Contrasting Groups

Number Correct	Logit Ability	Teacher Rating			Total	Meets to Below	Exceeds to Meets
		Below	Meets	Exceeds			
10	-3.072	1	0	0	1		
12	-2.825	1	0	0	1		
13	-2.712	3	0	0	3	0.00	
14	-2.604	3	0	0	3	0.00	
15	-2.501	4	0	0	4	0.00	
16	-2.401	3	0	0	3	0.00	
17	-2.305	6	0	0	6	0.00	
18	-2.212	7	0	0	7	0.00	
19	-2.120	7	0	0	7	0.00	
20	-2.031	6	0	0	6	0.03	0.00
21	-1.944	9	0	0	9	0.05	0.00
22	-1.857	4	1	0	5	0.05	0.00
23	-1.772	11	1	0	12	0.11	0.00
24	-1.688	9	0	0	9	0.13	0.00
25	-1.605	11	3	0	14	0.09	0.00
26	-1.522	13	1	0	14	0.17	0.00
27	-1.439	10	0	0	10	0.25	0.00
28	-1.356	11	5	0	16	0.24	0.00
29	-1.273	12	5	0	17	0.34	0.00
30	-1.190	12	3	0	15	0.38	0.07
31	-1.106	14	7	0	21	0.37	0.07
32	-1.022	23	7	2	32	0.41	0.06
33	-0.936	17	7	0	24	0.55	0.08
34	-0.849	21	12	0	33	0.60	0.07
35	-0.761	12	15	2	29	0.80	0.04
36	-0.671	18	14	0	32	0.99	0.03
37	-0.580	17	20	1	38	1.13	0.04
38	-0.485	20	26	0	46	1.24	0.03
39	-0.388	24	28	1	53	1.36	0.05
40	-0.287	27	43	2	72	1.61	0.06
41	-0.183	24	35	3	62	1.75	0.06
42	-0.074	13	42	4	59	2.23	0.09
43	0.041	20	41	2	63	2.63	0.11
44	0.162	8	44	7	59	3.72	0.14
45	0.291	19	59	9	87	4.10	0.16
46	0.429	7	63	13	83	5.55	0.20
47	0.580	8	47	10	65	6.41	0.26
48	0.746	7	59	16	82	9.35	0.35
49	0.932	5	67	28	100	10.56	0.40
50	1.147	4	54	35	93	13.32	0.52
51	1.401	3	58	26	87	17.06	0.72
52	1.720	3	55	47	105	20.64	0.97
53	2.157	1	39	60	100	25.57	1.23
54	2.8812	0	21	52	73		
55	4.1068	0	6	36	42		

Grade 6 Math Contrasting Groups

Number Correct	Logit Ability	Teacher Rating			Total	Meets to Below	Exceeds to Meets
		Below	Meets	Exceeds			
10	-3.229	2	1	0	3		
14	-2.767	4	0	0	4		
15	-2.665	4	0	0	4	0.11	0.00
16	-2.568	2	1	0	3	0.04	0.00
17	-2.473	7	0	0	7	0.03	0.00
18	-2.382	8	0	0	8	0.03	0.00
19	-2.293	9	0	0	9	0.00	
20	-2.206	7	0	0	7	0.05	0.00
21	-2.121	12	0	0	12	0.04	0.00
22	-2.037	8	2	0	10	0.03	0.00
23	-1.955	16	0	0	16	0.12	0.00
24	-1.874	18	0	0	18	0.13	0.00
25	-1.793	23	7	0	30	0.12	0.00
26	-1.713	18	2	0	20	0.17	0.06
27	-1.634	25	3	0	28	0.19	0.05
28	-1.555	19	6	1	26	0.22	0.05
29	-1.477	20	2	0	22	0.21	0.04
30	-1.398	16	9	0	25	0.26	0.03
31	-1.319	27	3	0	30	0.26	0.00
32	-1.239	30	9	0	39	0.32	0.03
33	-1.159	25	8	0	33	0.34	0.02
34	-1.079	26	11	1	38	0.47	0.04
35	-0.997	32	16	0	48	0.57	0.04
36	-0.914	29	23	2	54	0.74	0.03
37	-0.830	34	25	0	59	0.86	0.03
38	-0.745	28	35	0	63	1.07	0.05
39	-0.657	29	31	2	62	1.27	0.05
40	-0.568	17	33	3	53	1.43	0.06
41	-0.475	20	38	3	61	1.52	0.07
42	-0.380	29	39	2	70	1.85	0.06
43	-0.282	30	49	3	82	2.17	0.06
44	-0.179	20	56	2	78	2.32	0.07
45	-0.072	13	61	5	79	2.92	0.10
46	0.040	19	53	5	77	3.76	0.13
47	0.160	14	61	12	87	4.57	0.17
48	0.287	13	66	15	94	4.97	0.20
49	0.423	10	74	18	102	6.10	0.24
50	0.572	12	84	16	112	6.91	0.28

Number Correct	Logit Ability	Teacher Rating			Total	Meets to Below	Exceeds to Meets
		Below	Meets	Exceeds			
51	0.736	12	87	28	127	8.80	0.35
52	0.921	10	83	35	128	10.97	0.44
53	1.133	2	77	43	122	14.42	0.59
54	1.386	1	75	55	131	19.18	0.78
55	1.7034	1	53	59	113	32.13	1.06
56	2.1381	3	38	62	103	31.17	1.39
57	2.8603	1	14	54	69		
58	4.0845	0	7	30	37		

Grade 7 Math Contrasting Groups

Number Correct	Logit Ability	Teacher Rating			Total	Meets to Below	Exceeds to Meets
		Below	Meets	Exceeds			
4	-4.086	1	0	0	1		
5	-3.834	1	0	0	1		
9	-3.124	1	0	0	1	0.00	
10	-2.987	1	0	0	1	0.00	
11	-2.860	4	0	0	4	0.00	
12	-2.741	1	0	0	1	0.00	
13	-2.628	4	0	0	4	0.00	
14	-2.521	10	0	0	10	0.00	
15	-2.418	11	0	0	11	0.02	0.00
16	-2.319	9	0	0	9	0.03	0.00
17	-2.224	13	1	0	14	0.05	0.00
18	-2.131	19	1	0	20	0.04	0.00
19	-2.041	13	1	0	14	0.04	0.00
20	-1.953	20	0	0	20	0.03	0.00
21	-1.866	12	0	0	12	0.04	0.00
22	-1.781	31	1	0	32	0.03	0.00
23	-1.698	27	2	0	29	0.06	0.00
24	-1.615	35	1	0	36	0.07	0.00
25	-1.534	25	4	0	29	0.08	0.00
26	-1.453	33	2	0	35	0.08	0.00
27	-1.372	30	3	0	33	0.12	0.00
28	-1.292	39	3	0	42	0.14	0.00
29	-1.211	27	7	0	34	0.17	0.03
30	-1.131	38	9	0	47	0.21	0.03
31	-1.051	44	9	1	54	0.26	0.04
32	-0.970	37	10	0	47	0.26	0.07
33	-0.888	53	16	1	70	0.27	0.07
34	-0.806	49	14	2	65	0.41	0.03
35	-0.723	44	12	0	56	0.52	0.03
36	-0.639	38	39	0	77	0.65	0.02
37	-0.553	37	35	0	72	0.82	0.00
38	-0.466	36	33	0	69	0.99	0.01
39	-0.377	36	37	0	73	1.11	0.01

Number Correct	Logit Ability	Teacher Rating			Total	Meets to Below	Exceeds to Meets
		Below	Meets	Exceeds			
40	-0.285	43	44	1	88	1.23	0.03
41	-0.192	32	55	2	89	1.50	0.04
42	-0.095	36	57	3	96	1.92	0.06
43	0.006	30	72	5	107	2.24	0.09
44	0.110	15	72	8	95	2.72	0.10
45	0.219	23	48	8	79	3.45	0.13
46	0.333	12	67	9	88	3.90	0.18
47	0.454	19	83	14	116	4.24	0.22
48	0.583	15	58	19	92	5.93	0.25
49	0.7217	6	62	19	87	6.72	0.33
50	0.8724	6	74	26	106	8.74	0.46
51	1.0385	7	79	38	124	11.52	0.55
52	1.225	4	59	50	113	13.63	0.70
53	1.4394	6	60	51	117	15.38	0.82
54	1.6943	1	55	64	120	19.79	1.07
55	2.0134	3	70	61	134	21.27	1.26
56	2.4502	0	33	71	104	35.60	1.48
57	3.1743	1	16	48	65	53.00	2.62
58	4.3998	0	4	20	24		31.00
Total		1038	1308	521	2867		

Grade 8 Math Contrasting Groups

Number Correct	Logit Ability	Teacher Rating			Total	Meets to Below	Exceeds to Meets
		Below	Meets	Exceeds			
0	-8.597	1	0	0	1		
12	-2.841	1	0	0	1		
13	-2.726	2	0	0	2	0.08	0.00
14	-2.617	4	1	0	5	0.11	0.00
15	-2.514	4	0	0	4	0.09	0.00
16	-2.415	7	1	0	8	0.08	0.00
17	-2.321	17	1	0	18	0.04	0.00
18	-2.229	8	0	0	8	0.06	0.00
19	-2.141	16	0	0	16	0.04	0.00
20	-2.056	17	2	0	19	0.02	0.00
21	-1.972	24	0	0	24	0.04	0.00
22	-1.891	20	0	0	20	0.05	0.00
23	-1.811	22	2	0	24	0.04	0.00
24	-1.732	20	1	0	21	0.08	0.00
25	-1.655	19	1	0	20	0.09	0.00
26	-1.578	25	4	0	29	0.15	0.00
27	-1.503	20	2	0	22	0.20	0.00
28	-1.428	21	8	0	29	0.25	0.00
29	-1.353	20	6	0	26	0.26	0.00
30	-1.279	23	7	0	30	0.29	0.00
31	-1.205	29	6	0	35	0.31	0.00
32	-1.130	27	8	0	35	0.30	0.00
33	-1.056	31	13	0	44	0.32	0.00

Number Correct	Logit Ability	Teacher Rating			Total	Meets to Below	Exceeds to Meets
		Below	Meets	Exceeds			
34	-0.981	29	8	0	37	0.41	0.02
35	-0.906	24	10	0	34	0.47	0.03
36	-0.830	34	21	1	56	0.56	0.04
37	-0.753	22	14	1	37	0.68	0.03
38	-0.674	36	28	1	65	0.82	0.04
39	-0.595	33	28	0	61	0.89	0.04
40	-0.514	36	41	2	79	1.05	0.04
41	-0.431	27	26	2	55	1.16	0.04
42	-0.346	19	35	1	55	1.36	0.06
43	-0.259	25	33	1	59	1.50	0.06
44	-0.168	20	38	4	62	1.97	0.06
45	-0.074	28	47	2	77	2.12	0.07
46	0.024	17	62	5	84	2.37	0.11
47	0.126	17	47	5	69	2.73	0.12
48	0.234	20	48	10	78	3.42	0.14
49	0.348	19	72	11	102	3.86	0.16
50	0.471	16	75	11	102	4.75	0.20
51	0.602	11	78	15	104	5.92	0.26
52	0.746	7	74	22	103	8.46	0.31
53	0.9058	10	74	38	122	11.50	0.39
54	1.0855	2	88	33	123	15.00	0.54
55	1.293	4	77	43	124	19.00	0.70
56	1.541	2	62	68	132	37.11	0.87
57	1.8533	1	60	70	131	39.00	1.20
58	2.2831	0	47	77	124	68.00	1.57
59	3.0003	0	27	69	96	147.00	1.90
60	4.2209	0	8	36	44		3.33
60	4.2209	0	5	28	33		31.00

Grade 11 Math Contrasting Groups

Number Correct	Logit Ability	Teacher Rating			Total	Meets to Below	Exceeds to Meets
		Below	Meets	Exceeds			
10	-2.523	1	0	0	1		
11	-2.400	1	1	0	2		
12	-2.286	5	0	0	5	0.08	0.00
13	-2.178	9	0	0	9	0.08	0.00
14	-2.076	9	1	0	10	0.09	0.00
15	-1.979	13	1	0	14	0.11	0.17
16	-1.886	10	2	0	12	0.10	0.13
17	-1.796	15	2	1	18	0.11	0.10
18	-1.710	30	2	0	32	0.13	0.08
19	-1.626	23	3	0	26	0.15	0.05
20	-1.544	22	4	0	26	0.15	0.00
21	-1.465	36	8	0	44	0.17	0.00
22	-1.387	31	4	0	35	0.21	0.00
23	-1.311	30	5	0	35	0.22	0.00

24	-1.236	37	11	0	48	0.23	0.00
25	-1.162	31	9	0	40	0.27	0.00
26	-1.089	24	6	0	30	0.29	0.00
27	-1.016	50	16	0	66	0.31	0.04
28	-0.944	38	11	0	49	0.32	0.05
29	-0.873	32	12	2	46	0.40	0.04
30	-0.801	35	13	1	49	0.52	0.04
31	-0.730	33	24	0	57	0.61	0.05
32	-0.658	34	29	1	64	0.64	0.07
33	-0.587	25	19	1	45	0.75	0.05
34	-0.515	37	20	4	61	0.81	0.05
35	-0.442	34	31	0	65	0.83	0.05
36	-0.368	40	38	1	79	0.94	0.08
37	-0.294	19	20	1	40	0.96	0.05
38	-0.218	25	36	5	66	1.03	0.06
39	-0.142	44	31	1	76	1.11	0.08
40	-0.063	31	39	2	72	1.14	0.08
41	0.017	33	43	4	80	1.24	0.10
42	0.100	35	42	4	81	1.64	0.11
43	0.185	23	51	10	84	1.98	0.11
44	0.273	22	61	5	88	2.26	0.14
45	0.364	20	66	7	93	3.01	0.16
46	0.460	21	53	13	87	3.43	0.19
47	0.560	12	64	11	87	3.42	0.21
48	0.665	14	61	21	96	3.77	0.26
49	0.777	21	57	11	89	4.48	0.29
50	0.897	13	70	23	106	4.83	0.35
51	1.027	11	66	25	102	5.60	0.42
52	1.1682	7	65	31	103	7.69	0.56
53	1.3251	6	67	46	119	9.03	0.72
54	1.5024	5	55	57	117	13.30	0.86
55	1.7076	5	54	63	122	17.44	1.05
56	1.9532	0	65	66	131	22.18	1.35
57	2.263	0	38	60	98	33.33	1.66
58	2.6903	1	32	83	116	153.00	1.95
59	3.4051	0	11	59	70	50.00	3.44
60	4.624	0	7	30	37		31.00

Appendix H: Panelist Evaluation Form

NEBRASKA STATE ACCOUNTABILITY-MATHEMATICS (NESA-M)
STANDARD SETTING MEETING
JUNE 27-29, 2011
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 BOOKMARK 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:

3, 4, or 5 6, 7, or 8 High School Higher Education

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 Performance Level Descriptors (PLDs).

	Strongly Disagree	Disagree	Agree	Strongly Agree
Adequate information was provided to participants regarding the PLDs.				
Adequate time was provided for participants to gain understanding of the PLDs.				
The PLDs capture what students should know and be able to do at each grade level.				
The PLDs communicate a reasonable profile of students' achievement at Below the Standards, Meets the Standards, and Exceeds the Standards.				
The PLDs 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
Test Booklet				
Ordered Item Booklet				
Item Separation Chart				
Item Map				
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 bookmark 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
3	Below/Meets				
	Meets/Exceeds				
4	Below/Meets				
	Meets/Exceeds				
5	Below/Meets				
	Meets/Exceeds				
6	Below/Meets				
	Meets/Exceeds				
7	Below/Meets				
	Meets/Exceeds				
8	Below/Meets				
	Meets/Exceeds				
11	Below/Meets				
	Meets/Exceeds				

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 Bookmark meeting, please do so in the space below. All comments will remain anonymous.

THANK YOU FOR PARTICIPATING IN THE STANDARD SETTING MEETING.

Appendix I: Bookmark Panelist Evaluation Summary

	Grade	3	4	5	6	7	8	11
4 point scale	Count	39	39	39	38	32	51	15
Training	**Clarity**	3.41	3.18	3.55	3.28	3.13	3.22	3.40
	Time allotted	3.05	3.54	3.08	3.11	3.31	3.21	3.13
	Excer	3.16	3.18	3.32	3.19	2.97	3.07	3.27
Performance Level Descriptors	**Adeq info**	3.33	3.28	3.36	3.14	3.09	2.96	3.47
	Adeq time	3.41	3.31	3.54	3.32	3.10	3.16	3.53
	Capture	3.05	3.15	3.36	2.89	3.03	3.06	3.07
	Comm	3.00	3.08	3.33	2.92	2.97	3.06	3.00
	Helpful	3.13	3.23	3.49	2.92	3.22	3.25	3.00
Materials	**Test bklt**	3.51	3.38	3.64	3.32	3.41	3.45	3.67
	OIB	3.62	3.64	3.67	3.58	3.55	3.65	3.53
	Item sep	3.31	3.41	3.44	3.35	3.23	3.41	3.33
	Item map	3.00	3.00	3.21	3.21	3.16	3.18	3.13
	Stat data	3.46	3.49	3.51	3.21	3.13	3.24	3.47
Roles	**PS Lead**	3.29	3.14	3.37	3.14	2.97	3.04	3.40
	Rm Fac	3.34	3.11	3.64	3.03	3.00	2.86	3.40
	Other	3.21	3.25	3.34	3.13	3.03	3.10	3.50
Confidence	**Below/Meets**	3.21	3.38	3.46	3.05	3.06	3.02	2.73
	Meets/Exceeds	3.42	3.16	3.41	2.87	2.78	2.86	2.67

Amount of time*	**Rnd 1**	2.21	2.64	2.00	2.08	2.22	2.37	2.13
	Rnd 2	2.10	2.85	2.00	2.11	2.53	2.14	2.40
	Rnd 3	1.97	2.46	2.00	2.08	2.03	2.08	2.07

*Three point scale: Too Little, About Right, Too Much

For the quantitative analyses, the categories were coded 1 to 4, except questions about "Amount of Time" were 1 to 3. Please refer to Appendix H for the precise category labels.

Appendix J: Contrasting Groups Teacher Opinion Summary

Contrasting Groups Teacher Survey 2011

All Participants	Strongly Disagree(1)	Disagree(2)	Agree(3)	Strongly Agree(4)	Average	Total # Responded
1. The PLDs describe what students should know and be able to do in each grade.	1%	2%	81%	16%	3.1	373
2. The PLDs describe what students are expected to achieve at *Exceeds the Standards* level.	1%	4%	78%	17%	3.1	373
3. The PLDs describe what students are expected to achieve at *Meets the Standards* level.	1%	4%	79%	16%	3.1	374
4. The PLDs describe what students are expected to achieve at *Below the Standards* level.	2%	4%	78%	16%	3.0	372
5. The PLDs helped me place my students in the appropriate achievement level.	1%	8%	79%	12%	3.0	373
6. Adequate information was provided during training to understand the PLDs.	2%	10%	70%	18%	3.0	373
7. The process for completing on-line student ratings was explained clearly.	2%	5%	64%	29%	3.2	372
8. Completing the student ratings was easy to do.	1%	3%	57%	39%	3.3	372
9. Completing the student ratings took reasonable time.	1%	4%	61%	34%	3.3	372

10. Did you attend any of the on-line training sessions?	Yes	307	No	64
If not, did you access the recording of the on-line training session available from NDE and DRC?	Yes	30	No	49

Participants who answered "YES" #10	Strongly Disagree(1)	Disagree(2)	Agree(3)	Strongly Agree(4)	Average	Total # Responded
1. The PLDs describe what students should know and be able to do in each grade.	1%	2%	80%	17%	3.1	306
2. The PLDs describe what students are expected to achieve at *Exceeds the Standards* level.	1%	4%	77%	18%	3.1	306
3. The PLDs describe what students are expected to achieve at *Meets the Standards* level.	1%	4%	79%	17%	3.1	307
4. The PLDs describe what students are expected to achieve at *Below the Standards* level.	2%	5%	77%	16%	3.1	305
5. The PLDs helped me place my students in the appropriate achievement level.	0%	7%	79%	13%	3.0	307
6. Adequate information was provided during training to understand the PLDs.	1%	0%	69%	19%	3.1	307
7. The process for completing on-line student ratings was explained clearly.	1%	5%	64%	30%	3.2	306
8. Completing the student ratings was easy to do.	1%	3%	57%	40%	3.4	307
9. Completing the student ratings took reasonable time.	1%	4%	59%	36%	3.3	306

Participants who answered "No" to Q#10 part 1 and "Yes" to Part 2	Strongly Disagree(1)	Disagree(2)	Agree(3)	Strongly Agree(4)	Average	Total # Responded
1. The PLDs describe what students should know and be able to do in each grade.	0	0	79%	21%	3.2	28
2. The PLDs describe what students are expected to achieve at *Exceeds the Standards* level.	0	0	79%	21%	3.2	28
3. The PLDs describe what students are expected to achieve at *Meets the Standards* level.	0	0	79%	21%	3.2	28
4. The PLDs describe what students are expected to achieve at *Below the Standards* level.	0	0	79%	21%	3.2	28
5. The PLDs helped me place my students in the appropriate achievement level.	0	7%	79%	14%	3.1	28
6. Adequate information was provided during training to understand the PLDs.	0	0	82%	18%	3.2	28
7. The process for completing on-line student ratings was explained clearly.	0	4%	68%	29%	3.3	28
8. Completing the student ratings was easy to do.	0	4%	56%	41%	3.3	27
9. Completing the student ratings took reasonable time.	0	0	71%	29%	3.3	28

Participants who answered "No" to Q#10 part 1 and "No" to Part 2	Strongly Disagree(1)	Disagree(2)	Agree(3)	Strongly Agree(4)	Average	Total # Responded
1. The PLDs describe what students should know and be able to do in each grade.	3%	0	89%	9%	3.0	35
2. The PLDs describe what students are expected to achieve at *Exceeds the Standards* level.	3%	0	83%	14%	3.1	35
3. The PLDs describe what students are expected to achieve at *Meets the Standards* level.	3%	3%	83%	11%	3.0	35
4. The PLDs describe what students are expected to achieve at *Below the Standards* level.	3%	0	86%	11%	3.1	35
5. The PLDs helped me place my students in the appropriate achievement level.	0	11%	80%	9%	3.0	35
6. Adequate information was provided during training to understand the PLDs.	9%	0	66%	14%	2.9	35
7. The process for completing on-line student ratings was explained clearly.	9%	9%	69%	14%	2.9	35
8. Completing the student ratings was easy to do.	0	3%	63%	34%	3.3	35
9. Completing the student ratings took reasonable time.	0	0	77%	23%	3.2	35