

REPORT

Alignment Analysis of Mathematics Standards and Assessments

**South Dakota
Grades 3-8 and 11
2008**

Norman L. Webb

October 25, 2008

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Acknowledgements

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Mathematics

| | | |
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Executive Summary

A three-day alignment institute was conducted in Sioux Falls, South Dakota to analyze the alignment between the mathematics standards and the assessments administered in the spring of 2008 for grades 3-8 and 11. Seven reviewers participated in the analysis, three from South Dakota and four from other states. The reviewers included mathematics education experts, classroom teachers, university professors, and a district mathematics coordinator.

The alignment between the mathematics assessment and standards was found to be at least acceptable for all seven grades. The grade 8 assessment and standards were fully aligned. The seven assessments, each with 84 items, had over six items for each of the five mathematics strands, enough to have an acceptable level for the Categorical Concurrence criterion for each strand for each grade. Range also was acceptable for all strands for all seven grades. For most assessments reviewers found at least one item for each of the approximately 20 underlying standards. The main alignment issue was a weak Depth-of-Knowledge Consistency criterion for one or two strands for a grade. On six of the seven assessments fewer than 50% of the items had a DOK level that was the same or higher than the DOK level of the assigned standard for one or two strands. From one to three items would need to be replaced to remove this weakness in DOK. There were also balance weaknesses, but these were associated with a weakness in DOK or where the overemphasis of a standard was considered more a matter of preference than a major alignment issue.

Overall, only one to three items would need to be replaced on six of the assessments to attain full alignment between the assessments and the standards (see the summary table below). As such, the alignment was considered acceptable for all grades. Reviewers did make a number of comments on how individual items could be improved. Reviewers felt the assessments were too long and the emphasis for some grades was missed place while some important topics were not assessed.

Summary Table

Percent of South Dakota Mathematics Standards with Acceptable Level on Each Alignment Criteria for Grade 3-8 and 11

| Grade | <i>Categorical Concurrence</i> (six or more items) | <i>Depth-of-Knowledge Consistency</i> (50% at/above) | <i>Range of Knowledge</i> (50% of objectives) | <i>Balance of Representation</i> (without possible weakness) | <i>Estimated Range of Items per to be Added or Replaced for Full Alignment</i> |
|----------|---|---|--|---|--|
| Grade 3 | 100 | 80 | 100 | 100 | 1 |
| Grade 4 | 100 | 80 | 100 | 100 | 3 |
| Grade 5 | 100 | 80 | 100 | 60 | 1 |
| Grade 6 | 100 | 80 | 100 | 100 | 1 |
| Grade 7 | 100 | 80 | 100 | 100 | 1 |
| Grade 8 | 100 | 100 | 100 | 80 | 0 |
| Grade 11 | 100 | 60 | 100 | 80 | 3 |

| | |
|---------------------------|--|
| Categorical Concurrence | >6 items |
| Depth-of-Knowledge | >50% with DOK level the same or higher than level of corresponding Objectives |
| Range-of-Knowledge | >70% of objectives under a standard |
| Balance of Representation | A possible weakness if one or more objectives with a relative large number of items (e.g. five or more than the objective with the next highest number of items) |

Alignment Analysis of Mathematics Standards and Assessments

South Dakota Grades 3-8 and 11 2008

Norman L. Webb

Introduction

The alignment of expectations for student learning with assessments for measuring students' attainment of these expectations is an essential attribute for an effective standards-based education system. Alignment is defined as the degree to which expectations and assessments are in agreement and serve in conjunction with one another to guide an education system toward students learning what they are expected to know and do. As such, alignment is a quality of the relationship between expectations and assessments and not an attribute of any one of these two system components.

Alignment describes the match between expectations and an assessment that can be legitimately improved by changing either student expectations or the assessments. As a relationship between two or more system components, alignment is determined by using the multiple criteria described in detail in a National Institute for Science Education (NISE) research monograph, *Criteria for Alignment of Expectations and Assessments in Mathematics and Science Education* (Webb, 1997).

A three-day Alignment Analysis Institute was conducted September 29, 30, and October 1, 2008, in Sioux Falls, South Dakota. Seven reviewers—including mathematics content experts, district mathematics coordinator, university professors, assessment experts, and mathematics teachers—analyzed the agreement between the South Dakota assessments for mathematics and the South Dakota Mathematics Content Standards for grades 3-8 and 11. The assessments administered in April 2008 were used in this analysis. Four of the reviewers were from states other than South Dakota and three reviewers were from South Dakota.

South Dakota used the terminology of *goal/strand*, *indicator*, and *standard*. For mathematics the South Dakota content standards had five goal/strands—algebra (A), geometry (G), measurement (M), number sense (N), and statistics and probability (S). Indicators described key aspects of the goals/strands. The standards under the indicators specified what students are to know and be able to do related to the indicator at the specific grade level.

As part of the alignment institute, reviewers were trained to identify the depth of knowledge (DOK) of the standards and assessment items. This training included reviewing the definitions of the four DOK levels and reviewing examples of each. Then, the reviewers reviewed the DOK values determined through a consensus process in the 2007 analysis. Following the review of the complexity levels of the individual indicators,

individuals analyzed the assessment items. Following individual analyses of the items, reviewers participated in a debriefing discussion in which they assessed the degree to which they had coded particular items to the standards.

To derive the results from the analysis, the reviewers' responses were averaged. Any variance among reviewers was considered legitimate, with the true DOK level for the item falling somewhere between the two or more assigned values. Such variation could signify a lack of clarity in how the standards were written, the robustness of an item that could legitimately correspond to more than one standard and/or a DOK that falls in between two of the four defined levels. Reviewers were allowed to identify one assessment item as corresponding to up to three standards—one primary hit (standard) and up to two secondary hits. However, reviewers could only code one DOK level to each assessment item, even if the item corresponded to more than one standard.

Reviewers were instructed to focus primarily on the alignment between the state's standards and assessments. However, reviewers were encouraged to offer their opinions on the quality of the standards or of the assessment activities/items by writing a note about the item. Reviewers also could indicate whether there was a source-of-challenge issue with the item—i.e., a problem with the item that might cause the student who knows the material to give a wrong answer or enable someone who does not have the knowledge being tested to answer the item correctly.

The results produced from the institute pertain only to the issue of alignment between the South Dakota Mathematics Content Standards and the assessments. Note that an alignment analysis of this nature does not serve as external verification of the general quality of the state's standards or assessments. Rather, only the degree of alignment is discussed in the results. For these results, the means of the reviewers' coding were used to determine whether the alignment criteria were met. When reviewers did vary in their judgments, the means lessened the error that might result from any one reviewer's finding. Standard deviations are reported in the tables provided in Appendix B, which give one indication of the variance among reviewers.

This report describes the results of an alignment study of the South Dakota assessment administered in the spring 2008 and mathematics content standards for grades 3-8 and 11. The study addressed specific criteria related to the content agreement between the state's standards and grade-level assessments. Four criteria received major attention: categorical concurrence, depth-of-knowledge consistency, range-of-knowledge correspondence and balance of representation.

Alignment Criteria Used for This Analysis

This analysis judged the alignment between the standards and the assessments on the basis of four criteria. Information is also reported on the quality of items by identifying items with sources of challenge and other issues. For each alignment criterion,

an acceptable level was defined by what would be required to assure that a student had met the standards.

Categorical Concurrence

An important aspect of alignment between standards and assessments is whether both address the same content categories. The categorical-concurrence criterion provides a very general indication of alignment if both documents incorporate the same content. *The criterion of categorical concurrence between standards and assessments is met if the same or consistent categories of content appear in both documents.* This criterion was judged by determining whether the assessment included items measuring content from each strand. The analysis assumed that the assessment had to have at least six items for measuring content from a strand in order for an acceptable level of categorical concurrence to exist between the strand and the assessment. The number of items, six, is based on estimating the number of items that could produce a reasonably reliable subscale for estimating students' mastery of content on that subscale. Of course, many factors have to be considered in determining what a reasonable number is, including the reliability of the subscale, the mean score, and cutoff score for determining mastery. Using a procedure developed by Subkoviak (1988) and assuming that the cutoff score is the mean and that the reliability of one item is .1, it was estimated that six items would produce an agreement coefficient of at least .63. This indicates that about 63% of the group would be consistently classified as masters or nonmasters if two equivalent test administrations were employed. The agreement coefficient would increase if the cutoff score is increased to one standard deviation from the mean to .77 and, with a cutoff score of 1.5 standard deviations from the mean, to .88. Usually states do not report student results by strands or require students to achieve a specified cutoff score on indicators related to a strand. If a state did do this, then the state would seek a higher agreement coefficient than .63. Six items were assumed as a minimum for an assessment measuring content knowledge related to a strand, and as a basis for making some decisions about students' knowledge of that strand. If the mean for six items is 3 and one standard deviation is one item, then a cutoff score set at 4 would produce an agreement coefficient of .77. Any fewer items with a mean of one-half of the items would require a cutoff that would only allow a student to miss one item. This would be a very stringent requirement, considering a reasonable standard error of measurement on the subscale.

Depth-of-Knowledge Consistency

Standards and assessments can be aligned not only on the category of content covered by each, but also on the basis of the complexity of knowledge required by each. *Depth-of-knowledge consistency between standards and assessment indicates alignment if what is elicited from students on the assessment is as demanding cognitively as what students are expected to know and do as stated in the standards.* For consistency to exist between the assessment and the strands, as judged in this analysis, at least 50% of the items corresponding to a strand had to be at or above the depth-of-knowledge level of the corresponding standards: 50%, a conservative cutoff point, is based on the assumption that a minimal passing score for any one strand of 50% or higher would require the

student to successfully answer at least some items at or above the depth-of-knowledge level of the corresponding standards. For example, assume an assessment included six items related to one strand and students were required to answer correctly four of those items to be judged proficient—i.e., 67% of the items. If three, 50%, of the six items were at or above the depth-of-knowledge level of the corresponding standards, then for a student to achieve a proficient score would require the student to answer correctly at least one item at or above the depth-of-knowledge level of one standard. Some leeway was used in this analysis on this criterion. If a strand had between 40% and 50% of items at or above the depth-of-knowledge levels of the standards, then it was reported that the criterion was “weakly” met.

Interpreting and assigning depth-of-knowledge levels to both standards within strands and assessment items are essential requirements of alignment analysis. These descriptions help to clarify what the different levels represent in mathematics:

Level 1 (Recall) includes the recall of information such as a fact, definition, term or a simple procedure, as well as performing a simple algorithm or applying a formula. That is, in mathematics, a one-step, well defined and straight algorithmic procedure should be included at this lowest level. Other key words that signify Level 1 include “identify,” “recall,” “recognize,” “use” and “measure.” Verbs such as “describe” and “explain” could be classified at different levels, depending on what is to be described and explained.

Level 2 (Skill/Concept) includes the engagement of some mental processing beyond a habitual response. A Level 2 assessment item requires students to make some decisions about how to approach the problem or activity, whereas Level 1 requires students to demonstrate a rote response, perform a well-known algorithm, follow a set procedure (like a recipe) or perform a clearly defined series of steps. Keywords that generally distinguish a Level 2 item include “classify,” “organize,” “estimate,” “make observations,” “collect and display data” and “compare data.” These actions imply more than one step. For example, to compare data requires first identifying characteristics of the objects or phenomenon and then grouping or ordering the objects. Some action verbs, such as “explain,” “describe” or “interpret,” could be classified at different levels depending on the object of the action. Interpreting information from a simple graph or requiring mathematics information from the graph also is at Level 2. Interpreting information from a complex graph that requires some decisions on what features of the graph need to be considered and how information from the graph can be aggregated is at Level 3. Level 2 activities are not limited solely to number skills, but can involve visualization skills and probability skills. Other Level 2 activities include noticing and describing non-trivial patterns; explaining the purpose and use of experimental procedures; carrying out experimental procedures; making observations and collecting data; classifying, organizing and comparing data; and organizing and displaying data in tables, graphs and charts.

Level 3 (Strategic Thinking) requires reasoning, planning, using evidence and a higher level of thinking than the previous two levels. In most instances, requiring

students to explain their thinking is at Level 3. Activities that require students to make conjectures also are at this level. The cognitive demands at Level 3 are complex and abstract. The complexity does not result from the fact that there are multiple answers, a possibility for both Levels 1 and 2, but because the task requires more demanding reasoning. However, an activity that has more than one possible answer and requires students to justify the response they give would most likely be at Level 3. Other Level 3 activities include drawing conclusions from observations; citing evidence and developing a logical argument for concepts; explaining phenomena in terms of concepts; and using concepts to solve problems.

Level 4 (Extended Thinking) requires complex reasoning, planning, developing and thinking, most likely over an extended period of time. The extended time period is not a distinguishing factor if the required work is only repetitive and does not require applying significant conceptual understanding and higher-order thinking. For example, if a student has to take the water temperature from a river each day for a month and then construct a graph, this would be classified as Level 2. However, if the student is to conduct a river study that requires taking into consideration a number of variables, this would be at Level 4.

At Level 4, the cognitive demands of the task should be high and the work should be very complex. Students should be required to make several connections—relate ideas *within* the content area or *among* content areas—and to select one approach among many alternatives on how the situation should be solved in order to be at this highest level. Level 4 activities include developing and proving conjectures; designing and conducting experiments; making connections between a finding and related concepts and phenomena; combining and synthesizing ideas into new concepts; and critiquing experimental designs.

Range-of-Knowledge Correspondence

For standards and assessments to be aligned, the breadth of knowledge required on both should be comparable. *The range-of-knowledge criterion is used to judge whether a comparable span of knowledge expected of students by a strand is the same as, or corresponds to, the span of knowledge that students need in order to correctly answer the assessment items/activities.* The criterion for correspondence between span of knowledge for a strand and an assessment considers the number of standards within the strand with one related assessment item/activity. Fifty percent of the standards for a strand had to have at least one related assessment item in order for the alignment on this criterion to be judged acceptable. This level is based on the assumption that students' knowledge should be tested on content from over half of the domain of knowledge for a strand. This assumes that each standard for a strand should be given equal weight. Depending on the balance in the distribution of items and the need to have a low number of items related to any one standard, the requirement that assessment items need to be related to more than 50% of the standards for an strand increases the likelihood that students will have to demonstrate knowledge on more than one standard per strand to achieve a minimal passing score. As with the other criteria, a state may choose to make

the acceptable level on this criterion more rigorous by requiring an assessment to include items related to a greater number of the standards. However, any restriction on the number of items included on the test will place an upper limit on the number of standards that can be assessed. Range-of-knowledge correspondence is more difficult to attain if the content expectations are partitioned among a greater number of strands and a large number of standards. If 50% or more of the standards for a strand had a corresponding assessment item, then the range-of-knowledge correspondence criterion was met. If between 40% and 50% of the standards for a strand had a corresponding assessment item, the criterion was “weakly” met.

Balance of Representation

In addition to comparable depth and breadth of knowledge, aligned standards and assessments require that knowledge be distributed equally in both. The range-of-knowledge criterion only considers the number of standards within a strand hit (a standard with a corresponding item); it does not take into consideration how the hits (or assessment items/activities) are distributed among these standards. *The balance-of-representation criterion is used to indicate the degree to which one standard is given more emphasis on the assessment than another.* An index is used to judge the distribution of assessment items. This index only considers the standards for a strand that have at least one hit—i.e., one related assessment item per standard. The index is computed by considering the difference in the proportion of standards and the proportion of hits assigned to the standard. An index value of 1 signifies perfect balance and is obtained if the hits (corresponding items) related to a strand are equally distributed among the standards for the given strand. Index values that approach 0 signify that a large proportion of the hits are on only one or two of all of the standards hit. Depending on the number of standards and the number of hits, a unimodal distribution (most items related to one standard and only one item related to each of the remaining standards) has an index value of less than .5. A bimodal distribution has an index value of around .55 or .6. Index values of .7 or higher indicate that items/activities are distributed among all of the standards at least to some degree (e.g., every standard has at least two items) and is used as the acceptable level on this criterion. Index values between .6 and .7 indicate the balance-of-representation criterion has only been “weakly” met.

Source-of-Challenge Criterion

The source-of-challenge criterion is only used to identify items on which the major cognitive demand is inadvertently placed and is other than the targeted mathematics standard, concept, or application. Cultural bias or specialized knowledge could be reasons for an item to have a source-of-challenge problem. Such item characteristics may result in some students not answering an assessment item, or answering an assessment item incorrectly, or at a lower level, even though they possess the understanding and skills being assessed.

Findings

Standards

The consensus DOK value for each mathematics standard from the 2007 analysis can be found in Appendix A. Table 1 shows the percentages of standards at each DOK level for each of the five strands. The proportion of the DOK levels by standards for grades 3-6 was fairly constant. The majority of the standards were judged to have a DOK level 1. Only one standard for each grade was judged to have a DOK level 3. For grades 7 and 8, reviewers did not judge that any of the standards had a DOK level 3. For both of these grades the standards were nearly evenly divided between DOK levels 1 and 2. Grades 7 and 8 did have a slightly higher proportion of standards with a DOK level 2 than did the standards for grades 3-6 indicating some increase in complexity. For grade 11, only one-third of the standards were judged to have a DOK level 1. Half of the standards had a DOK level 2 and three standards (12%) had a DOK level 3 (strategic thinking). As appropriate, the grade 11 standards were judged to have the highest proportion of items with DOK levels 2 and 3.

Table 1

Percent of Standards by Depth-of-Knowledge (DOK) Levels for Grades 3-8 and 11 South Dakota Alignment Analysis for Mathematics

| Grade | Total Number of Standards | DOK Level | Number of Standards by Level | Percent within Strand by Level |
|-------|---------------------------|-----------|------------------------------|--------------------------------|
| 3 | 23 | 1 | 12 | 52 |
| | | 2 | 10 | 43 |
| | | 3 | 1 | 4 |
| 4 | 25 | 1 | 16 | 64 |
| | | 2 | 8 | 32 |
| | | 3 | 1 | 4 |
| 5 | 28 | 1 | 18 | 64 |
| | | 2 | 9 | 32 |
| | | 4 | 1 | 3 |
| 6 | 18 | 1 | 11 | 61 |
| | | 2 | 6 | 33 |
| | | 3 | 1 | 5 |
| 7 | 18 | 1 | 10 | 55 |
| | | 2 | 8 | 44 |
| 8 | 16 | 1 | 7 | 43 |
| | | 2 | 9 | 56 |
| 11 | 24 | 1 | 9 | 37 |
| | | 2 | 12 | 50 |
| | | 3 | 3 | 12 |

If no particular standard is targeted by a given assessment item, reviewers were instructed to code the item at the level of a strand or an indicator. This coding to a generic standard sometimes indicates that the item is inappropriate for the grade level. However, if the item is grade-appropriate, then this situation may instead indicate that there is a part of the content not expressly or precisely described in the standards. These items may highlight areas in the standards that should be changed, or made more precise. Table 2 displays the assessment items coded to generic standards by more than one reviewer.

A majority of the reviewers coded four or five items to generic standards (objectives) for grades 4, 5, 6, and 11. Two or more reviewers did not code any items on the grades 3 and 8 assessments to generic standards and only one item on the grade 7 assessment to generic standards. Reviewers were unable to find precise standards that mapped to the items assigned to generic standards. For example, grade 4 Item 70 required students to use a line of symmetry, but no grade 4 standard included line of symmetry. Other items mapped to standards at different grade levels or did not match the full intent of a standard. For example, grade 5 Item 89 was a function (input/output) table with one operation. Standard 5.A.4.1 (students are able to solve problems using patterns involving more than one operation) was the standard that was the closest match, but this standard expected students to use more than one operation. The number of items coded to generic standards does indicate that the assessments for at least four of the grades included a few items—less than 10 percent—that did not coincide precisely to the grade level expectations.

Reviewers’ debriefing comments also highlight some ambiguities in the objectives. These comments can be found in Appendix D.

Table 2
Items Coded to Generic Objectives by More Than One Reviewer, South Dakota Alignment Analysis for Mathematics, Grades 3-8 and 11 2008

| Grade | Generic Objective | Assessment Item (Number of Reviewers) |
|-------|-------------------|---------------------------------------|
| 4 | 4.G.1 | 70(7) |
| 4 | 4.N.1 | 5(6), 12(7), 38(6) |
| 4 | 4.S.1 | 89(7) |
| 5 | 5.A.4 | 89(6) |
| 5 | 5.N.1 | 30(7) |
| 5 | 5.N.2 | 1(5), 68(7) |
| 5 | 5.S.2 | 37(6) |
| 6 | 6.G.2 | 1(7) |
| 6 | 6.N.2 | 30(7), 58(7) |
| 6 | 6.S.2 | 70(7), 92(5) |
| 7 | 7.G.1 | 30(6) |
| 11 | 9-12 A.2 | 7(3) |
| 11 | 9-12 A.3 | 64(2) |
| 11 | 9-12 M.1 | 85(2) |
| 11 | 9-12 S.2 | 91(2) |

Alignment of Curriculum Standards and Assessments

Table 3 displays the number of items and points for each assessment form. In the analysis that follows, multiple-point items are given additional weight for alignment purposes. For example, a 3-point item is counted towards the alignment as 3 identically coded 1-point items. The items on all of the forms were assigned a value of one point so the total point value was the same as the total number of items.

Table 3
Number of Items and Point Value by Grade for South Dakota Assessments, Grades 3-8 and 11 2008

| Grade Level | Number of Items | Number of Multi-Point Items | Total Point Value |
|-------------|-----------------|-----------------------------|-------------------|
| 3 | 84 | 0 | 84 |
| 4 | 84 | 0 | 84 |
| 5 | 84 | 0 | 84 |
| 6 | 84 | 0 | 84 |
| 7 | 84 | 0 | 84 |
| 8 | 84 | 0 | 84 |
| 11 | 84 | 0 | 84 |

The results of the analysis for each of the four alignment criteria are summarized in Tables 4.1-4.7. More detailed data on each of the criteria are given in Appendix B, in the first three tables. With each table and for each grade, a description of the satisfaction of the alignment criteria for the given grade is provided. The reviewers' debriefing comments provide further detail about the individual reviewers' impressions of the alignment.

In Tables 4.1-4.7, "YES" indicates that an acceptable level was attained between the assessment and the learning goal on the criterion. "WEAK" indicates that the criterion was nearly met, within a margin that could simply be due to error in the system. "NO" indicates that the criterion was not met by a noticeable margin—10% over an acceptable level for Depth-of-Knowledge Consistency, 10% over an acceptable level for Range-of-Knowledge Correspondence, and .1 under an index value of .7 for Balance of Representation.

Grade 3

The alignment between the mathematics grade 3 assessment for 2008 and the South Dakota mathematics standards was acceptable and nearly found to be fully aligned. The assessment had six or more items for each of the five strands, a sufficient number to reliably make a judgment about students' proficiency for each strand. Thus, the Categorical Concurrence criterion was acceptable for all five strands. The Depth-of-Knowledge Consistency criterion was acceptable for four of the five strands. The only

weakness was between the Strand 3A (Algebra) and the assessment. Only 49% of the 26 items, on the average, that mapped to standards under this strand had a DOK level that was the same or higher than the DOK level of the assigned standard, one percentage point lower than the 50% needed to be considered acceptable. Range and balance was acceptable for all five strands. Eighty percent or more of the standards under each of the grade 3 standards for each strand had at least one corresponding items. The items were also evenly distributed among these standards to have balance.

Overall, the alignment for grade 3 was acceptable with only one item targeting a standard under Strand 3A needed to be replaced by an item with a DOK level that is the same or higher than the DOK level of the assigned standard. Although the data support strong alignment between the grade 3 mathematics standards and the assessment, reviewers indicated that the alignment could be improved. Reviewers felt that the assessment was longer than it needed to be to assess students' mathematics competency at grade 3. The number of items devoted to computation could be reduced whereas the number of measurement items was lower than would be expected. Reviewers noted that money was used as a context for decimal computation, but was only briefly assessed. The items' level of complexity was comparable to that expected by the standards, but tended toward DOK levels 1 and 2. Five of the reviewers made a note that the grade 3 assessment should have more items at DOK level 3, strategic thinking.

Table 4.1

Summary of Acceptable Levels on Alignment Criteria for Mathematics Grade 3 Standards and Assessments for South Dakota Alignment Analysis 2008

| <i>Grade 3 Standards</i> | <i>Alignment Criteria</i> | | | |
|-------------------------------------|------------------------------------|--|-------------------------------|--------------------------------------|
| | <i>Categorical Concurrence</i> | <i>Depth-of- Knowledge Consistency</i> | <i>Range of Knowledge</i> | <i>Balance of Representation</i> |
| 3.A - ALGEBRA | YES | WEAK | YES | YES |
| 3.G - GEOMETRY | YES | YES | YES | YES |
| 3.M - MEASUREMENT | YES | YES | YES | YES |
| 3.N - NUMBER SENSE | YES | YES | YES | YES |
| 3.S - STATISTICS AND PROBABILITY | YES | YES | YES | YES |

Grade 4

The alignment between the grade 4 mathematics assessment and standards was acceptable. All of the five strands had more than nine items that targeted underlying standards, sufficient for acceptable levels on the Categorical Concurrence criterion. The DOK levels for four of the five strands were appropriate. However, reviewers found that nearly two-thirds of the 13 items that mapped to standards under Strand 4.S (Statistics and Probability) had a DOK level that was lower than the DOK level of the assigned standard. This was higher than the proportion needed to have an acceptable level on the Depth-of-Knowledge Consistency criterion. The assessment did have at least one item that targeted nearly all of the standards for an appropriate range. The balance was also

good with all of the items nearly evenly distributed among the standards underlying a strand.

Overall, the alignment for grade 4 was considered acceptable. Only three of the S4 items would need to be replaced to attain full alignment. The three items to be replaced would need to be those items with a lower DOK level than the DOK level of the targeted standard under Strand 4.S. Reviewers did denote some topics that were omitted from the assessment such as median and range. Reviewers’ notes indicated a few other topics that could have been tested in more detail while other areas were over emphasized (Appendix D). As for grade 3, reviewers felt that the assessment was too long and could have included a few items with a DOK level 3. The comment of one reviewer was representative of the others, “Although this assessment seemed to have more Level 2 items than grade 3, there were few that really pushed the thinking. There were no Level 3 items.”

Table 4.2
Summary of Acceptable Levels on Alignment Criteria for Mathematics Grade 4 Standards and Assessments for South Dakota Alignment Analysis 2008

| <i>Grade 4 Standards</i> | <i>Alignment Criteria</i> | | | |
|----------------------------------|--------------------------------|---------------------------------------|---------------------------|----------------------------------|
| | <i>Categorical Concurrence</i> | <i>Depth-of-Knowledge Consistency</i> | <i>Range of Knowledge</i> | <i>Balance of Representation</i> |
| 4.A - ALGEBRA | YES | YES | YES | YES |
| 4.G - GEOMETRY | YES | YES | YES | YES |
| 4.M - MEASUREMENT | YES | YES | YES | YES |
| 4.N - NUMBER SENSE | YES | YES | YES | YES |
| 4.S - STATISTICS AND PROBABILITY | YES | NO | YES | YES |

Grade 5

The alignment between the grade 5 mathematics assessment and the South Dakota standards was acceptable. The items on the 84 item assessment were adequately distributed among the five strands with over 12 items for each strand. Thus, the Categorical Concurrence criterion was acceptable for all five strands. Depth-of-Knowledge Consistency was acceptable except for a weakness for Strand 5.S. Only five of the 12 items had a DOK level that was the same or higher than the DOK level of the assigned standard under Strand 5.S. This is below the 50% used in this study as an acceptable level. Range was acceptable for all five strands. However, one standard under each of two strands (measurement and statistics and probability) was over emphasized compared to other underlying standards. The measurement Standard 5.M.1.2 had eight of 12 corresponding items and the statistics and probability standard 5.S.1.1 had six of the 12 corresponding items. For both of these standards, the assessment included more items than needed to adequately sample students’ knowledge in relationship to other content knowledge represented by the other standards.

Overall, the alignment for grade 5 was acceptable. Only one item with a DOK level lower than the DOK level of the assigned standard under Strand 5.S would need to be replaced to have full alignment. If an item that currently targets Standard 5.S.1.1 is replaced by an item that targets another statistics and probability standard, then the balance issue would be removed. Since all of the other three alignment criteria were acceptable for Strand 5.M, the balance issue for that standard is considered more a matter of preference. One reviewer noted a number of topics that were expected to be assessed that were not:

The items did not address transformational geometry (turns or flips). There were no items measuring finding prime or composite numbers or factors of whole numbers. There were no items addressing squares of numbers, and none addressing multiplication and division of decimals that were not also money problems. These are all topics I would have expected based on the standards to be assessed at this grade level. There was extremely heavy attention given to the standard on writing one-step equations and solving them, on problems with money (which was very heavily measured in previous grades as well), on solving problems with estimation, and on analyzing data.

Reviewers felt the assessment was too long and found issues with the standards as well as the assessment. One reviewer commented, “The alignment is off because of the wording of the objectives and the over emphasis on some rather trivial objectives (the probability one at this level). There is also an over-emphasis on translations problems (writing an algebraic equation or expression) for a problem.”

Table 4.3

Summary of Acceptable Levels on Alignment Criteria for Mathematics Grade 5 Standards and Assessments for South Dakota Alignment Analysis 2008

| <i>Grade 5 Standards</i> | <i>Alignment Criteria</i> | | | |
|----------------------------------|--------------------------------|---------------------------------------|---------------------------|----------------------------------|
| | <i>Categorical Concurrence</i> | <i>Depth-of-Knowledge Consistency</i> | <i>Range of Knowledge</i> | <i>Balance of Representation</i> |
| 5.A - ALGEBRA | YES | YES | YES | YES |
| 5.G - GEOMETRY | YES | YES | YES | YES |
| 5.M - MEASUREMENT | YES | YES | YES | WEAK |
| 5.N - NUMBER SENSE | YES | YES | YES | YES |
| 5.S - STATISTICS AND PROBABILITY | YES | WEAK | YES | WEAK |

Grade 6

The alignment between the South Dakota grade 6 mathematics standards and the grade 6 assessment was acceptable, nearly fully aligned. The 84 items on the assessment were distributed among the five strands with from seven items (measurement) to 32 items (algebra) allocated to individual strands. This was sufficient for the assessment and the strands to have an acceptable level for the Categorical Concurrence criterion. Reviewers judged that all of the grade 6 items had a DOK level of 1 or 2, but this was sufficient for

at least two thirds of the items for each strand, except geometry, to have a DOK level that was comparable to the assigned standard. For geometry slightly fewer than half of the items, on the average, had a DOK level that was the same or higher than the DOK level of the assigned standard, 49%. Range and balance was acceptable for all five strands. At least one item mapped to each of the underlying standards under each of the five strands.

Overall, the grade 6 alignment for mathematics was acceptable. Only one item that mapped to a standard under the geometry strand would need to be replaced to meet the minimum requirement for full alignment used in this analysis. Reviewers acknowledged that the alignment between the grade 6 standards and the assessment was good. One reviewer did note that the assessment was longer than needed with about one-third of the items targeting five of the 20 standards. Even though the assessment had at least one item for each of the standards, some topics under standards were not assessed including similarity, parallel, and reflections. Also, Standard 6.G.2.1 expected students to identify a reflection, but only a translation was tested, which was not mentioned in the standards. For standard 6.M.1.1, students were never asked to convert measurements within the metric system. Reviewers found five items that did not precisely match any of the grade 6 standards and were coded to generic standards. This, along with one item identified as having a source-of-challenge issue, indicated that some improvements could be made on the grade 6 assessment.

Table 4.4

Summary of Acceptable Levels on Alignment Criteria for Mathematics Grade 6 Standards and Assessments for South Dakota Alignment Analysis 2008

| Grade 6 <i>Standards</i> | Alignment Criteria | | | |
|------------------------------------|--------------------------------|---------------------------------------|---------------------------|----------------------------------|
| | <i>Categorical Concurrence</i> | <i>Depth-of-Knowledge Consistency</i> | <i>Range of Knowledge</i> | <i>Balance of Representation</i> |
| 6.A – ALGEBRA | YES | YES | YES | YES |
| 6.G - GEOMETRY | YES | WEAK | YES | YES |
| 6.M - MEASUREMENT | YES | YES | YES | YES |
| 6.N - NUMBER SENSE | YES | YES | YES | YES |
| 6.S - STATISTICS AND PROBABILITY | YES | YES | YES | YES |

Grade 7

For grade 7, the South Dakota standards and the assessment were fully aligned. The only alignment weakness was with balance for Strand 7.G (Geometry). Most of the items were mapped to two standards (seven items to Standard 7.G.2.1 and six items to Standard 7.G.1.1) while other geometry items only had one or three items. Because all of the other alignment criteria were acceptably met for Strand 7.G, the over emphasis of these two geometry standards is considered a matter of preference. Reviewers found from six (Strand 7.M) to 27 (Strand 7.A) items that mapped to each of the five standards. Over 50% of the items for each strand had the same or higher DOK level than the assigned standard. Also, the assessment had at least one item that mapped to each of the

underlying standards with the items fairly evenly distributed except for Strand 7.G. Thus, the alignment criteria of Categorical Concurrence, Depth-of-Knowledge Consistency, and the Range-of-Knowledge Correspondence were acceptably met for all five standards.

Overall, the grade 7 standards and assessment were fully aligned. Even though the results of the analysis indicated the grade 7 standards and the assessment met the minimum requirements for being fully aligned, reviewers made a number of comments on how the assessment could be improved. Reviewers noted that the level of complexity of the items did not require students to use critical thinking skills and that the assessment was longer than needed to be. Other reviewers' comments included:

Reviewer 1-There were two general issues needing attention--algebraic vs numeric expressions, and equations vs expressions. Algebraic expressions should be distinguished from numeric expressions, and equations should be distinguished from expressions. The assessment items did not address those distinctions adequately.

Reviewer 2-Although the results will probably look aligned, many of the objectives are rated at level 1 that should be pushed to level 2 at this grade. It is maintaining a low-level advancement for sixth grade. (The sixth-grade test requires more thinking than this one).

Reviewer 3-The measurement standard was weak and there needed to be more questions in this area. Standard A.1.1 deals only with algebraic expressions and you could also add equations here when you deal with replacement values. The formula page was given to the students but there weren't any questions that needed it and this may stress the students. A huge concept is missing here. I thought the test was very weak in the use of integers as this is a major focus in 7th grade.

Table 4.5

Summary of Acceptable Levels on Alignment Criteria for Mathematics Grade 7 Standards and Assessments for South Dakota Alignment Analysis 2008

| <i>Grade 7 Standards</i> | <i>Alignment Criteria</i> | | | |
|-------------------------------------|------------------------------------|--|-------------------------------|---|
| | <i>Categorical Concurrence</i> | <i>Depth-of- Knowledge Consistency</i> | <i>Range of Knowledge</i> | <i>Balance of Represent ation</i> |
| 7.A - ALGEBRA | YES | YES | YES | YES |
| 7.G - GEOMETRY | YES | YES | YES | WEAK |
| 7.M - MEASUREMENT | YES | YES | YES | YES |
| 7.N - NUMBER SENSE | YES | YES | YES | YES |
| 7.S - STATISTICS AND PROBABILITY | YES | YES | YES | YES |

Grade 8

The grade 8 mathematics standards and assessment were fully aligned. All four alignment criteria for each of the five standards were acceptably met. The items were found to target the grade 8 standards with none of the items mapped to a generic standard by two or more of the reviewers. The majority of the reviewers indicated they thought the alignment was acceptable, a higher percentage than for other grades. But, similar to the other grades, the reviewers thought level of complexity of the standards and assessment should be increased some, particularly at the grade 8 level. Other comments made by reviewers included:

Reviewer 1-Proportional reasoning is slighted. It occurs in two places in the objectives, so it being slighted is rather lost in the analysis. The objectives are broad, so many things fit under each one. The geometry ideas did not move forward (only more on 3-d, but rather low level).

Reviewer 2-The test weighed heavily on algebra, with 28 of the items being devoted to this particular strand (3 standards had seven or eight items). Measurement was quite weak, with only 8 questions being devoted to this strand. However, each standard was assessed with at least one question. The number sense strand also had 2 standards with seven or eight items.

Table 4.6

Summary of Acceptable Levels on Alignment Criteria for Mathematics Grade 8 Standards and Assessments for South Dakota Alignment Analysis 2008

| Grade 8 Standards | Alignment Criteria | | | |
|-------------------------------------|------------------------------------|--|-------------------------------|---|
| | <i>Categorical Concurrence</i> | <i>Depth-of- Knowledge Consistency</i> | <i>Range of Knowledge</i> | <i>Balance of Represent ation</i> |
| 8.A - ALGEBRA | YES | YES | YES | YES |
| 8.G - GEOMETRY | YES | YES | YES | YES |
| 8.M - MEASUREMENT | YES | YES | YES | YES |
| 8.N - NUMBER SENSE | YES | YES | YES | YES |
| 8.S - STATISTICS AND PROBABILITY | YES | YES | YES | YES |

Grade 11

The alignment between the grade 11 mathematics standards and the grade 11 assessment was acceptable. However, unlike for the previous grades, the alignment had three weaknesses. The DOK levels of items that mapped to Strand 9-12.A (Algebra) and Strand 9-12.S (Statistics and Probability), on the average, had a lower DOK level than the DOK level of the assigned standards. Only 44% of the 28 items that mapped to standards under Strand A and 46% of the 13 items that mapped to standards under Strand S had a DOK level that was the same or higher than DOK level of the assigned standard. The balance weakness between the assessment and Strand S also signified an alignment issue. Five items mapped to Standard 9-12.S.1.2 and five items mapped to Standard 9-12.S.2.2

while only one or two items mapped to other standards under Strand S. Other than these three alignment weaknesses, the alignment was good. The distribution of items among the five strands was essentially the same as for grades 7 and 8 and sufficient to have an acceptable level for the Categorical Concurrence criterion. The DOK was acceptable for three of the five strands. Range was acceptable for all five strands and balance for four.

Overall, the grade 11 mathematics assessment and standards was acceptable. Only three items would need to be replaced to attain full alignment. Two items that mapped to standards under Strand A and one item that mapped to a standard under Strand S would need to be replaced to attain full alignment. These items would need to be replaced by items with DOK levels that are at least the same as the DOK level of the assigned standard. If one item that was mapped to one of the two over emphasized standards under Strand S is replaced by one that targets another standard then the balance would be improved. Reviewers made a number of comments on individual items and about how the assessment could be improved. Some comments by reviewers include:

Reviewer 1-Once again, the alignment is there---but need to think about the depth of thinking expected. Much of this is school mathematics and not the type of thinking that will be needed for the future, everyday person. This can be nicely combined with the mathematics that students will need for advanced study.

Reviewer 2- The standards were appropriately specific for the most part. There should be more specificity in the standards around the practical applications of percentages that students are more likely to need to know as adults. There is no mention in the standards to substituting values for variables in formulas, although the skill appeared often in the assessment and would be useful to students as they use common formulas.

Reviewer 3- The statistic S.1.1 I thought was below grade level and higher level questions could be placed here. S.1.2 should state compare multiple variable data sets or find mean, median, mode and range in one data set. Standard A.2.1 states that students are able to use algebraic properties to transform multi-step, single variable, first degree equations and there was a question that dealt with one step equations.

Table 4.7

Summary of Acceptable Levels on Alignment Criteria for Mathematics Grade 11 Standards and Assessments for South Dakota Alignment Analysis 2008

| <i>Grade 11 Standards</i> | <i>Alignment Criteria</i> | | | |
|-------------------------------------|--------------------------------|---------------------------------------|---------------------------|----------------------------------|
| | <i>Categorical Concurrence</i> | <i>Depth-of-Knowledge Consistency</i> | <i>Range of Knowledge</i> | <i>Balance of Representation</i> |
| 9-12.A - ALGEBRA | YES | WEAK | YES | YES |
| 9-12.G - GEOMETRY | YES | YES | YES | YES |
| 9-12.M - MEASUREMENT | YES | YES | YES | YES |
| 9-12.N - NUMBER SENSE | YES | YES | YES | YES |
| 9-12.S - STATISTICS AND PROBABILITY | YES | WEAK | YES | WEAK |

Source of Challenge Issue and Reviewers' Comments

Reviewers were instructed to document any source-of-challenge issue and to provide any other comments they may have. These comments can be found in Tables (grade).5 and (grade).7 in Appendix C. Two or more reviewers identified source-of-challenge issues with from one to three items for grades 3 through 6 and no items for grades 7, 8, and 11. Reviewers wrote detailed notes on several items for each grade. After coding each grade-level assessment, reviewers also were asked to respond to five debriefing questions. All of the comments made by the reviewers are given in Appendices D. The notes in general offer an opinion on the item or give an explanation of the reviewers' coding.

Reliability Among Reviewers

The overall intraclass correlations among the mathematics reviewers' assignment of DOK levels to items was high for seven reviewers for grades 3-8 and 11 (Table 5). An intraclass correlation value greater than 0.8 generally indicates a high level of agreement among the reviewers. The intraclass correlations either equaled this high level or were higher. A pairwise comparison was used to determine the degree of reliability of reviewer coding at the standard level and at the strand level. The values for all of the pairwise comparison indices were high, higher than for most alignment studies. Reviewers discussed their codings after analyzing the items for each grade. The intraclass correlations and pairwise agreements were computed after the adjudication when reviewers had the option to change their codings if there was a compelling reason. The reliability coefficients may not represent values obtained from independent codings.

Table 5

Intraclass and Pairwise Comparisons, South Dakota Alignment Analysis for Mathematics Grades 3-8 and 11 Assessments

| Grade | Intraclass Correlation | Pairwise Comparison: | Pairwise: Standard | Pairwise: Strand |
|-------|------------------------|----------------------|--------------------|------------------|
| 3 | .84 | .80 | .87 | .94 |
| 4 | .86 | .78 | .87 | .94 |
| 5 | .93 | .81 | .92 | .96 |
| 6 | .86 | .74 | .91 | .98 |
| 7 | .90 | .77 | .90 | .97 |
| 8 | .88 | .74 | .82 | .92 |
| 11 | .80 | .68 | .78 | .95 |

Summary

A three-day alignment institute was conducted in Sioux Falls, South Dakota to analyze the alignment between the mathematics standards and the assessments administered in the spring of 2008 for grades 3-8 and 11. Seven reviewers participated in the analysis, three from South Dakota and four from other states. The reviewers included

mathematics education experts, classroom teachers, university professors, and a district mathematics coordinator.

The alignment between the mathematics assessment and standards was found to be at least acceptable for all seven grades. The grade 8 assessment and standards were fully aligned. The seven assessments, each with 84 items, had over six items for each of the five mathematics strands, enough to have an acceptable level for the Categorical Concurrence criterion for each strand for each grade. Range also was acceptable for all strands for all seven grades. For most assessments reviewers found at least one item for each of the approximately 20 underlying standards. The main alignment issue was a weak Depth-of-Knowledge Consistency criterion for one or two strands for a grade. On six of the seven assessments fewer than 50% of the items had a DOK level that was the same or higher than the DOK level of the assigned standard for one or two strands. From one to three items would need to be replaced to remove this weakness in DOK. There were also balance weaknesses, but these were associated with a weakness in DOK or where the overemphasis of a standard was considered more a matter of preference than a major alignment issue.

Overall, only one to three items would need to be replaced on six of the assessments to attain full alignment between the assessments and the standards (see the summary table below). As such, the alignment was considered acceptable for all grades. Reviewers did make a number of comments on how individual items could be improved. Reviewers felt the assessments were too long and the emphasis for some grades was missed place while some important topics were not assessed.

Summary Table

Percent of South Dakota Mathematics Standards with Acceptable Level on Each Alignment Criteria for Grade 3-8 and 11

| Grade | <i>Categorical Concurrence</i> (six or more items) | <i>Depth-of-Knowledge Consistency</i> (50% at/above) | <i>Range of Knowledge</i> (50% of objectives) | <i>Balance of Representation</i> (without possible weakness) | <i>Estimated Range of Items per to be Added or Replaced for Full Alignment</i> |
|----------|---|---|--|---|--|
| Grade 3 | 100 | 80 | 100 | 100 | 1 |
| Grade 4 | 100 | 80 | 100 | 100 | 3 |
| Grade 5 | 100 | 80 | 100 | 60 | 1 |
| Grade 6 | 100 | 80 | 100 | 100 | 1 |
| Grade 7 | 100 | 80 | 100 | 100 | 1 |
| Grade 8 | 100 | 100 | 100 | 80 | 0 |
| Grade 11 | 100 | 60 | 100 | 80 | 3 |

- Categorical Concurrence >6 items
- Depth-of-Knowledge >50% with DOK level the same or higher than level of corresponding Objectives
- Range-of-Knowledge >70% of objectives under a standard

Balance of Representation A possible weakness if one or more objectives with a relative large number of items (e.g. five or more than the objective with the next highest number of items)

References

Subkoviak, M. J. (1988). A practitioner's guide to computation and interpretation of reliability indices for mastery tests. *Journal of Educational Measurement*, 25(1), 47-55.

Webb, N. L. (1997). *Criteria for alignment of expectations and assessments in mathematics and science education*. Council of Chief State School Officers and National Institute for Science Education Research Monograph No. 6. Madison: University of Wisconsin, Wisconsin Center for Education Research.

Appendix A

South Dakota
Grades 3-8 and 11
Mathematics
Standards and Group Consensus
DOK Values

Table 3.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 3

| Level | Description | DOK |
|---------|--|-----|
| 3.A | ALGEBRA | 2 |
| 3.A.1 | Use procedures to transform algebraic expressions. | 2 |
| 3.A.1.1 | Students are able to explain the relationship between repeated addition and multiplication. | 2 |
| 3.A.1.2 | Students are able to identify special properties of 0 and 1 with respect to arithmetic operations (addition, subtraction, multiplication). | 1 |
| 3.A.2 | Use a variety of algebraic concepts and methods to solve equations and inequalities. | 2 |
| 3.A.2.1 | Students are able to select appropriate relational symbols (<, >, =) to compare numbers. | 2 |
| 3.A.2.2 | Students are able to solve problems involving addition and subtraction of whole numbers. <ul style="list-style-type: none"> • Use concrete materials to model and solve equations (hands-on). • Represent given problem situations using diagrams, models, and symbolic expressions. | 2 |
| 3.A.3 | Interpret and develop mathematical models. | 1 |
| 3.A.3.1 | Students are able to use the relationship between multiplication and division to compute and check results. | 1 |
| 3.A.4 | Describe and use the properties and behaviors of relations, functions, and inverses. | 2 |
| 3.A.4.1 | Students are able to extend linear patterns. | 2 |
| 3.A.4.2 | Students are able to use number patterns and relationships to learn basic facts. | 2 |
| 3.G | GEOMETRY | 1 |
| 3.G.1 | Use deductive and inductive reasoning to recognize and apply properties of geometric figures. | 1 |
| 3.G.1.1 | Students are able to recognize and compare the following plane and solid geometric figures: square, rectangle, triangle, cube, sphere, and cylinder. | 1 |
| 3.G.1.2 | Students are able to identify points, lines, line segments, and rays. | 1 |
| 3.G.2 | Use properties of geometric figures to solve problems from a variety of perspectives. | 2 |
| 3.G.2.1 | Students are able to demonstrate relationships between figures using similarity and congruence. | 2 |
| 3.M | MEASUREMENT | 1 |
| 3.M.1 | Apply measurement concepts in practical applications. | 1 |
| 3.M.1.1 | Students are able to read and tell time before and after the hour within five-minute intervals on an analog clock. | 1 |
| 3.M.1.2 | Students are able to count, compare, and solve problems using a collection of coins and bills. | 2 |
| 3.M.1.3 | Students are able to identify U.S. Customary units of length (feet), weight (pounds), and capacity (gallons). | 1 |
| 3.M.1.4 | Students are able to select appropriate units to measure length (inch, foot, mile, yard); weight (ounces, pounds, tons); and capacity (cups, pints, quarts, gallons). | 2 |
| 3.M.1.5 | Students are able to measure length to the nearest 1/2 inch. | 1 |
| 3.N | NUMBER SENSE | 1 |
| 3.N.1 | Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real | 1 |

Table 3.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 3

| Level | Description | DOK |
|---------|---|-----|
| | numbers. | |
| 3.N.1.1 | Students are able to place in order and compare whole numbers less than 10,000, using appropriate words and symbols. | 1 |
| 3.N.1.2 | Students are able to find multiples of whole numbers 2, 5, and 10. | 1 |
| 3.N.1.3 | Students are able to name and write fractions from visual representations. <ul style="list-style-type: none"> • Recognize that fractions and decimals are parts of a whole. | 2 |
| 3.N.2 | Apply operations within the set of real numbers. | 1 |
| 3.N.2.1 | Students are able to add and subtract whole numbers up to three digits and multiply two digits by one digit. <ul style="list-style-type: none"> • Recall multiplication facts through the tens. | 1 |
| 3.N.3 | Develop conjectures, predictions, or estimations in the process of problem solving and verify or justify the results. | 1 |
| 3.N.3.1 | Students are able to round two-digit whole numbers to the nearest tens, and three-digit whole numbers to the nearest hundreds. | 1 |
| 3.S | STATISTICS AND PROBABILITY | 2 |
| 3.S.1 | Use statistical models to gather, analyze, and display data to draw conclusions. | 3 |
| 3.S.1.1 | Students are able to ask and answer questions from data represented in bar graphs, pictographs and tally charts. | 3 |
| 3.S.1.2 | Students are able to gather data and use the information to complete a scaled and labeled graph. | 2 |
| 3.S.2 | Apply the concepts of probability to predict outcomes and solve problems. | 1 |
| 3.S.2.1 | Students are able to describe events as certain or impossible. | 1 |

Table 4.14
Group Consensus
South Dakota Content Standards, Mathematics, Grade 4

| Level | Description | DOK |
|---------|--|-----|
| 4.A | ALGEBRA | 1 |
| 4.A.1 | Use procedures to transform algebraic expressions. | 1 |
| 4.A.1.1 | Students are able to simplify whole number expressions involving addition, subtraction, multiplication, and division. | 1 |
| 4.A.1.2 | Students are able to recognize and use the commutative property of addition and multiplication. <ul style="list-style-type: none"> Use models to identify commutative property. | 1 |
| 4.A.1.3 | Students are able to relate the concepts of addition, subtraction, multiplication, and division to one another. | 1 |
| 4.A.2 | Use a variety of algebraic concepts and methods to solve equations and inequalities. | 1 |
| 4.A.2.1 | Students are able to select appropriate relational symbols (<, >, =) to make number sentences true. | 1 |
| 4.A.2.2 | Students are able to simplify a two-step equation using whole numbers. | 1 |
| 4.A.3 | Interpret and develop mathematical models. | 2 |
| 4.A.3.1 | Students are able to write and solve number sentences that represent one-step word problems using whole numbers. <ul style="list-style-type: none"> Use multiple methods, such as physical models, tables and charts, the number line, and graphs. | 2 |
| 4.A.4 | Describe and use the properties and behaviors of relations, functions and inverses. | 2 |
| 4.A.4.1 | Students are able to solve problems involving pattern identification and completion of patterns. | 2 |
| 4.G | GEOMETRY | 1 |
| 4.G.1 | Use deductive and inductive reasoning to recognize and apply properties of geometric figures. | 1 |
| 4.G.1.1 | Students are able to identify the following plane and solid figures: pentagon, hexagon, octagon, pyramid, rectangular prism, and cone. | 1 |
| 4.G.1.2 | Students are able to identify parallel, perpendicular, and intersecting lines. | 1 |
| 4.G.2 | Use properties of geometric figures to solve problems from a variety of perspectives. | 2 |
| 4.G.2.1 | Students are able to compare geometric figures using size, shape, orientation, congruence, and similarity. | 2 |
| 4.G.2.2 | Students are able to identify a slide (translation) of a given figure. | 1 |
| 4.M | MEASUREMENT | 2 |
| 4.M.1 | Apply measurement concepts in practical applications. | 2 |
| 4.M.1.1 | Students are able to identify equivalent periods of time and solve problems. <ul style="list-style-type: none"> Measure time using fractions to 1/4. | 1 |
| 4.M.1.2 | Students are able to solve problems involving money including unit conversion. <ul style="list-style-type: none"> Use of proper notation. | 2 |
| 4.M.1.3 | Students are able to use scales of length, temperature, capacity, and weight. <ul style="list-style-type: none"> Select and use the most appropriate U.S. Customary units for given measurement situations. | 2 |
| 4.M.1.4 | Students are able to measure length to the nearest quarter inch. <ul style="list-style-type: none"> Estimate length to the nearest inch. | 1 |

Table 4.14
Group Consensus
South Dakota Content Standards, Mathematics, Grade 4

| Level | Description | DOK |
|---------|---|-----|
| 4.N | NUMBER SENSE | 1 |
| 4.N.1 | Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers. | 1 |
| 4.N.1.1 | Students are able to read, write, order, and compare numbers from .01 to 1,000,000. <ul style="list-style-type: none"> • Read and write word names and the appropriate symbols in mathematical sentences. • Use expanded form notation. | 1 |
| 4.N.1.2 | Students are able to find multiples of whole numbers through 12. | 1 |
| 4.N.1.3 | Students are able to use a number line to compare numerical value of fractions or mixed numbers (fourths, halves, and thirds). <ul style="list-style-type: none"> • Identify improper fractions, proper fractions, and mixed numbers. | 2 |
| 4.N.1.4 | Students are able to interpret negative integers in temperature. | 1 |
| 4.N.2 | Apply operations within the set of real numbers. | 1 |
| 4.N.2.1 | Students are able to find the products of two-digit factors and quotient of two natural numbers using a one-digit divisor. <ul style="list-style-type: none"> • Recall and apply multiplication and division facts through the 12s. | 1 |
| 4.N.2.2 | Students are able to add and subtract decimals with the same number of decimal places. | 1 |
| 4.N.3 | Develop conjectures, predictions, or estimations in the process of problem solving and verify or justify the results. | 2 |
| 4.N.3.1 | Students are able to estimate sums and differences in whole numbers and money to determine if a given answer is reasonable. | 2 |
| 4.S | STATISTICS AND PROBABILITY | 2 |
| 4.S.1 | Use statistical models to gather, analyze and display data to draw conclusions. | 3 |
| 4.S.1.1 | Students are able to interpret data from graphical representations and draw conclusions. | 3 |
| 4.S.1.2 | Given a small ordered data set of whole number data points (odd number of points), students are able to identify the median, mode, and range. | 1 |
| 4.S.2 | Apply the concepts of probability to predict outcomes and solve problems. | 2 |
| 4.S.2.1 | Students are able to determine the probability of simple events limited to equally likely and not equally likely outcomes. | 2 |

Table 5.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 5

| Level | Description | DOK |
|---------|---|-----|
| 5.A | ALGEBRA | 2 |
| 5.A.1 | Use procedures to transform algebraic expressions. | 2 |
| 5.A.1.1 | Students are able to use a variable to write an addition expression. | 2 |
| 5.A.1.2 | Students are able to recognize and use the associative property of addition and multiplication. | 1 |
| 5.A.2 | Use a variety of algebraic concepts and methods to solve equations and inequalities. | 2 |
| 5.A.2.1 | Students are able to write one-step first degree equations using the set of whole numbers and find a solution. | 2 |
| 5.A.3 | Interpret and develop mathematical models. | 2 |
| 5.A.3.1 | Students are able to, using whole numbers, write and solve number sentences that represent two-step word problems. | 2 |
| 5.A.3.2 | Students are able to identify information and apply it to a given formula. | 1 |
| 5.A.4 | Describe and use the properties and behaviors of relations, functions, and inverses. | 2 |
| 5.A.4.1 | Students are able to solve problems using patterns involving more than one operation. | 2 |
| 5.G | GEOMETRY | 1 |
| 5.G.1 | Use deductive and inductive reasoning to recognize and apply properties of geometric figures. | 1 |
| 5.G.1.1 | Students are able to describe and identify isosceles and equilateral triangles, pyramids, rectangular prisms, and cones. | 1 |
| 5.G.1.2 | Students are able to identify acute, obtuse, and right angles. | 1 |
| 5.G.2 | Use properties of geometric figures to solve problems from a variety of perspectives. | 1 |
| 5.G.2.1 | Students are able to determine lines of symmetry in rectangles, squares, and triangles. | 1 |
| 5.G.2.2 | Students are able to identify a turn or flip (rotation or reflection) of a given figure. | 1 |
| 5.G.2.3 | Students are able to use two-dimensional coordinate grids to find locations and represent points and simple figures. | 1 |
| 5.M | MEASUREMENT | 1 |
| 5.M.1 | Apply measurement concepts in practical applications. | 1 |
| 5.M.1.1 | Students are able to determine elapsed time within an a.m. or p.m. period on the quarter-hour. | 1 |
| 5.M.1.2 | Students are able to solve problems involving money including making change. | 2 |
| 5.M.1.3 | Students are able to use and convert U.S. Customary units of length (inches, feet, yard), and weight (ounces, pounds). | 1 |
| 5.M.1.4 | Students are able to use appropriate tools to measure length, weight, temperature, and area in problem solving. <ul style="list-style-type: none"> • Estimate length and weight. | 1 |
| 5.N | NUMBER SENSE | 1 |
| 5.N.1 | Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers. | 1 |
| 5.N.1.1 | Students are able to read, write, order, and compare numbers from .001 to 1,000,000,000. | 1 |
| 5.N.1.2 | Students are able to find prime, composite, and factors of whole numbers from 1 to 50. | 1 |
| 5.N.1.3 | Students are able to identify alternative representations of fractions and decimals | 2 |

Table 5.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 5

| Level | Description | DOK |
|---------|--|-----|
| | involving tenths, fourths, halves, and hundredths. | |
| 5.N.1.4 | Students are able to locate negative integers on a number line. | 1 |
| 5.N.1.5 | Students are able to determine the squares of numbers 1 – 12. | 1 |
| 5.N.2 | Apply operations within the set of real numbers. | 1 |
| 5.N.2.1 | Students are able to find the quotient of whole numbers using two-digit divisors. <ul style="list-style-type: none"> Use the inverse relationship of multiplication and division to find a missing factor. | 1 |
| 5.N.2.2 | Students are able to determine equivalent fractions including simplification (lowest terms of fractions). | 1 |
| 5.N.2.3 | Students are able to multiply and divide decimals by natural numbers (1 – 9). | 1 |
| 5.N.3 | Develop conjectures, predictions, or estimations in the process of problem solving and verify or justify the results. | 2 |
| 5.N.3.1 | Students are able to use different estimation strategies to solve problems involving whole numbers, decimals, and fractions to the nearest whole number. <ul style="list-style-type: none"> Solve problems using non-routine strategies. | 2 |
| 5.S | STATISTICS AND PROBABILITY | 2 |
| 5.S.1 | Use statistical models to gather, analyze, and display data to draw conclusions. | 4 |
| 5.S.1.1 | Students are able to gather, graph, and interpret data. <ul style="list-style-type: none"> Develop survey questions and collect appropriate data. Use appropriate scales to represent data in simple bar graphs, line graphs, pictographs, and line plots. | 4 |
| 5.S.1.2 | Students are able to calculate and explain mean for a whole number data set. | 2 |
| 5.S.2 | Apply the concepts of probability to predict outcomes and solve problems. | 2 |
| 5.S.2.1 | Students are able to classify probability of simple events as certain, likely, unlikely, or impossible. | 1 |
| 5.S.2.2 | Students are able to use models to display possible outcomes. | 2 |

Table 6.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 6

| Level | Description | DOK |
|---------|--|-----|
| 6.A | ALGEBRA | 2 |
| 6.A.1 | Use procedures to transform algebraic expressions. | 2 |
| 6.A.1.1 | Students are able to use order of operations, excluding nested parentheses and exponents, to simplify whole number expressions. | 1 |
| 6.A.1.2 | Students are able to write algebraic expressions involving addition or multiplication using whole numbers. <ul style="list-style-type: none"> Show multiplication in various forms: $2 \cdot 3$ or $2n$ or $2(3)$. | 2 |
| 6.A.2 | Use a variety of algebraic concepts and methods to solve equations and inequalities. | 2 |
| 6.A.2.1 | Students are able to write and solve one-step 1st degree equations, with one variable, involving inverse operations using the set of whole numbers. | 2 |
| 6.A.3 | Interpret and develop mathematical models. | 1 |
| 6.A.3.1 | Students are able to identify and graph ordered pairs in Quadrant I on a coordinate plane. | 1 |
| 6.A.3.2 | Students are able to solve one-step problems involving ratios and rates. | 1 |
| 6.A.4 | Describe and use properties and behaviors of relations, functions, and inverses. | 2 |
| 6.A.4.1 | Students are able to use concrete materials, graphs and algebraic statements to represent problem situations. <ul style="list-style-type: none"> Recognize, describe, and extend arithmetic sequences and patterns. Use variables to represent given quantities in problem situations. | 2 |
| 6.G | GEOMETRY | 2 |
| 6.G.1 | Use deductive and inductive reasoning to recognize and apply properties of geometric figures. | 2 |
| 6.G.1.1 | Students are able to identify and describe the characteristics of triangles and quadrilaterals. <ul style="list-style-type: none"> Identify and describe similarities and differences of triangles: Scalene Isosceles Equilateral Right Acute Identify and describe similarities and differences of quadrilaterals: Trapezoid Parallelogram Rectangle Rhombus Square Obtuse | 2 |
| 6.G.1.2 | Students are able to identify and describe angles. <ul style="list-style-type: none"> Identify and describe differences of angles: Acute Obtuse Right | 1 |
| 6.G.2 | Use properties of geometric figures to solve problems from a variety of perspectives. | 2 |
| 6.G.2.1 | Students are able to use basic shapes to demonstrate geometric concepts. | 2 |

Table 6.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 6

| Level | Description | DOK |
|---------|--|-----|
| | <ul style="list-style-type: none"> • Demonstrate lines of symmetry. • Use basic shapes to demonstrate congruency (triangle, rectangle, square, parallelogram). • Use basic shapes to demonstrate similarity (triangle, rectangle, square, parallelogram). • Use basic shapes to demonstrate perpendicular lines (triangle, rectangle, square, trapezoid). • Use basic shapes to demonstrate parallel lines (rectangles, squares, parallelograms). • Identify a reflection. | |
| 6.M | MEASUREMENT | 1 |
| 6.M.1 | Apply measurement concepts in practical applications. | 1 |
| 6.M.1.1 | Students are able to select, use, and convert appropriate unit of measurement for a situation. <ul style="list-style-type: none"> • Determine elapsed time. • Convert length, capacity, and mass within the Metric system (kilo-, base unit, centi-, milli-). • Convert weight and length within U.S. Customary system. | 1 |
| 6.M.1.2 | Students are able to find the perimeter and area of squares and rectangles (whole number measurements). <ul style="list-style-type: none"> • Apply strategies and/or formulas. • Use appropriate unit of measure. | 1 |
| 6.N | NUMBER SENSE | 1 |
| 6.N.1 | Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers. | 1 |
| 6.N.1.1 | Students are able to represent fractions in equivalent forms and convert between fractions, decimals, and percents using halves, fourths, tenths, hundredths. <ul style="list-style-type: none"> • Identify both standard and word forms (millions to ten-thousandths) of positive rational numbers. | 1 |
| 6.N.1.2 | Students are able to find factors and multiples of whole numbers. <ul style="list-style-type: none"> • Classify numbers as prime or composite. | 1 |
| 6.N.2 | Apply number operations with real numbers and other number systems. | 1 |
| 6.N.2.1 | Students are able to add, subtract, multiply, and divide decimals. | 1 |
| 6.N.3 | Develop conjectures, predictions, or estimations to solve problems and verify or justify the results. | 2 |
| 6.N.3.1 | Students are able to use various strategies to solve one- and two-step problems involving positive decimals. <ul style="list-style-type: none"> • Formulate rules to solve practical problems (problem solving). • Use estimation strategies to make predictions and test the reasonableness of answer. • Explain strategies and justify answers. | 2 |
| 6.S | STATISTICS AND PROBABILITY | 1 |

Table 6.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 6

| Level | Description | DOK |
|---------|--|-----|
| 6.S.1 | Use statistical models to gather, analyze, and display data to draw conclusions. | 3 |
| 6.S.1.1 | Students are able to find the mean, mode, and range of an ordered set of positive data. | 1 |
| 6.S.1.2 | Students are able to display data using bar and line graphs and draw conclusions from data displayed in a graph. | 3 |
| 6.S.2 | Apply the concepts of probability to predict events/outcomes and solve problems. | 1 |
| 6.S.2.1 | Students are able to find the probability of a simple event. <ul style="list-style-type: none"> • Express the result as a fraction. | 1 |

Table 7.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 7

| Level | Description | DOK |
|---------|---|-----|
| 7.A | ALGEBRA | 2 |
| 7.A.1 | Use procedures to transform algebraic expressions. | 2 |
| 7.A.1.1 | Students are able to write and evaluate algebraic expressions using the set of whole numbers. <ul style="list-style-type: none"> • Use replacement values for variables. • Use order of operations. | 2 |
| 7.A.1.2 | Students are able to identify associative, commutative, distributive, and identity properties involving algebraic expressions. | 1 |
| 7.A.2 | Use a variety of algebraic concepts and methods to solve equations and inequalities. | 2 |
| 7.A.2.1 | Students are able to write and solve one-step 1st degree equations, with one variable, using the set of integers and inequalities, with one variable, using the set of whole numbers. <ul style="list-style-type: none"> • Addition property of equality. • Multiplication property of equality. • Inverse operations. | 2 |
| 7.A.3 | Interpret and develop mathematical models. | 2 |
| 7.A.3.1 | Students are able to identify and graph ordered pairs on a coordinate plane and inequalities on a number line. <ul style="list-style-type: none"> • Quadrants I-IV • Use a scatterplot to draw an approximate line of best fit in a coordinate plane. | 1 |
| 7.A.3.2 | Students are able to model and solve multi-step problems involving rates. <ul style="list-style-type: none"> • Better buy • Unit rates | 2 |
| 7.A.4 | Describe and use properties and behaviors of relations, functions, and inverses. | 2 |
| 7.A.4.1 | Students are able to recognize one-step patterns using tables, graphs, and models and create one-step algebraic expressions representing the pattern. <ul style="list-style-type: none"> • Identify arithmetic and geometric sequences. • Extend arithmetic and geometric sequences. | 2 |
| 7.G | GEOMETRY | 1 |
| 7.G.1 | Use deductive and inductive reasoning to recognize and apply properties of geometric figures. | 1 |
| 7.G.1.1 | Students are able to identify, describe, and classify polygons having up to 10 sides. <ul style="list-style-type: none"> • Relationships among triangles. • Relationships among quadrilaterals. • Sketch two-dimensional figures. | 1 |
| 7.G.1.2 | Students are able to identify and describe elements of geometric figures. <ul style="list-style-type: none"> • Altitude • Midpoint • Bisector • Radius • Diameter | 1 |

Table 7.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 7

| Level | Description | DOK |
|---------|--|-----|
| | <ul style="list-style-type: none"> Chord | |
| 7.G.2 | Use properties of geometric figures to solve problems from a variety of perspectives. | 2 |
| 7.G.2.1 | Students are able to demonstrate ways that shapes can be transformed. <ul style="list-style-type: none"> Translation Rotation Reflection | 2 |
| 7.M | MEASUREMENT | 1 |
| 7.M.1 | Apply measurement concepts in practical applications. | 1 |
| 7.M.1.1 | Students are able to select, use, and convert appropriate units of measurement for a situation including capacity and angle measurement. <ul style="list-style-type: none"> Measure angles to the nearest degree. Measure length, capacity, and mass. Convert within the Metric system (kilo- thru milli-). Convert within the U.S. Customary system (weight, length, capacity). | 1 |
| 7.M.1.2 | Students, when given the formulas, are able to find circumference, perimeter, and area of circles, parallelograms, triangles, and trapezoids (whole number measurements). <ul style="list-style-type: none"> Use appropriate unit of measure. Estimate the area of irregular shapes. | 1 |
| 7.N | NUMBER SENSE | 2 |
| 7.N.1 | Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers. | 2 |
| 7.N.1.1 | Students are able to represent numbers in a variety of forms by describing, ordering, and comparing integers, decimals, percents, and fractions. <ul style="list-style-type: none"> Describe and compare numbers using ratios including appropriate notation, e.g., $a:b$, a/b, a to b. | 2 |
| 7.N.1.2 | Students are able to find and use common multiples and factors of whole numbers. <ul style="list-style-type: none"> Least Common Multiple Greatest Common Factor Divisibility rules (2, 3, 4, 6, 9, 10). | 1 |
| 7.N.2 | Apply number operations with real numbers and other number systems. | 1 |
| 7.N.2.1 | Students are able to add, subtract, multiply, and divide integers and positive fractions. | 1 |
| 7.N.3 | Develop conjectures, predictions, or estimations to solve problems and verify or justify the results. | 2 |
| 7.N.3.1 | Students are able to use various strategies to solve one- and two-step problems involving positive fractions and integers. <ul style="list-style-type: none"> Formulate rules to solve practical problems involving integers (problem solving). Use estimation strategies to make predictions and test the reasonableness of the answer. Explain strategies and justify answers. | 2 |
| 7.S | STATISTICS AND PROBABILITY | 1 |
| 7.S.1 | Use statistical models to gather, analyze, and display data to draw conclusions. | 2 |

Table 7.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 7

| Level | Description | DOK |
|---------|---|-----|
| 7.S.1.1 | Students are able to find the mean, median, mode, and range of a set of data. | 1 |
| 7.S.1.2 | Students are able to display data, using frequency tables, line plots, stem-and-leaf plots, and make predictions from data displayed in a graph. | 2 |
| 7.S.2 | Apply the concepts of probability to predict events/outcomes and solve problems. | 1 |
| 7.S.2.1 | Students are able, given a sample space, to find the probability of a specific outcome. <ul style="list-style-type: none"> • Simple probability. • Express probability as a ratio, decimal, or percent. | 1 |

Table 8.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 8

| Level | Description | DOK |
|---------|--|-----|
| 8.A | ALGEBRA | 2 |
| 8.A.1 | Use procedures to transform algebraic expressions. | 1 |
| 8.A.1.1 | Students are able to use properties to expand, combine, and simplify 1st degree algebraic expressions with the set of integers. <ul style="list-style-type: none"> • Properties include associative, commutative, distributive, and identity properties. • Use order of operations with exponents and nested parentheses. • Determine if two 1st degree algebraic expressions are equivalent. | 1 |
| 8.A.2 | Use a variety of algebraic concepts and methods to solve equations and inequalities. | 2 |
| 8.A.2.1 | Students are able to write and solve two-step 1st degree equations, with one variable, and one-step inequalities, with one variable, using the set of integers. <ul style="list-style-type: none"> • Inverse operations • Addition property of equality. • Multiplication property of equality. | 2 |
| 8.A.3 | Interpret and develop mathematical models. | 2 |
| 8.A.3.1 | Students are able to describe and determine linear relationships. <ul style="list-style-type: none"> • Determine slope from a line or ordered pairs on a graph. • Identify x and y intercepts from a graph. | 2 |
| 8.A.4 | Describe and use properties and behaviors of relations, functions, and inverses. | 2 |
| 8.A.4.1 | Students are able to create rules to explain the relationship between numbers when a change in the first variable affects the second variable. | 2 |
| 8.A.4.2 | Students are able to describe and represent relations using tables, graphs, and rules. <ul style="list-style-type: none"> • Represent situations with patterns and relations to find exact or approximate solutions to problems. • Make predictions relating two variables using a rule or a graph. | 2 |
| 8.G | GEOMETRY | 1 |
| 8.G.1 | Use deductive and inductive reasoning to recognize and apply properties of geometric figures. | 1 |
| 8.G.1.1 | Students are able to describe and classify prisms, pyramids, cylinders, and cone. <ul style="list-style-type: none"> • Faces, edges, and vertices. | 1 |
| 8.G.1.2 | Students, when given any two sides of an illustrated right triangle, are able to use the Pythagorean Theorem to find the third side. <ul style="list-style-type: none"> • Given the formula. • Using whole numbers for the known values. | 1 |
| 8.G.2 | Use properties of geometric figures to solve problems from a variety of perspectives. | 2 |
| 8.G.2.1 | Students are able to write and solve proportions that express the relationships between corresponding parts of similar quadrilaterals and triangles. | 2 |
| 8.M | MEASUREMENT | 2 |
| 8.M.1 | Apply measurement concepts in practical applications. | 2 |
| 8.M.1.1 | Students are able to apply proportional reasoning to solve measurement problems with rational number measurements. <ul style="list-style-type: none"> • Conversion within measurement systems. • Use scale drawings to represent situations. • Indirect measurement. | 2 |

Table 8.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 8

| Level | Description | DOK |
|---------|--|-----|
| 8.M.1.2 | Students are able to find area, volume, and surface area with whole number measurements. <ul style="list-style-type: none"> • Use appropriate unit of measure • Apply strategies and/or formulas. • Volume of rectangular prisms, rectangular pyramids, cylinders, and cones. • Surface area of rectangular prisms and cylinders. • Area of composite shapes. | 1 |
| 8.N | NUMBER SENSE | 1 |
| 8.N.1 | Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers. | 1 |
| 8.N.1.1 | Students are able to represent numbers in a variety of forms and identify the subsets of rational numbers. <ul style="list-style-type: none"> • Exponents • Scientific notation • Absolute value • Radicals (perfect squares) • Graph on a number line | 1 |
| 8.N.2 | Apply number operations with real numbers and other number systems. | 1 |
| 8.N.2.1 | Students are able to read, write, and compute within any subset of rational numbers. <ul style="list-style-type: none"> • Solve problems involving discount, markup, commission, profit, and simple interest. | 1 |
| 8.N.3 | Develop conjectures, predictions, or estimations to solve problems and verify or justify the results. | 2 |
| 8.N.3.1 | Students are able to use various strategies to solve multi-step problems involving rational numbers. <ul style="list-style-type: none"> • Explain strategies and justify answers. • Formulate rules to solve practical problems involving rational numbers. • Use estimation strategies to make predictions and test the reasonableness of the answer. | 2 |
| 8.S | STATISTICS AND PROBABILITY | 2 |
| 8.S.1 | Use statistical models to gather, analyze, and display data to draw conclusions. | 2 |
| 8.S.1.1 | Students are able to find the mean, median, mode, and range of a data set from a stem-and-leaf plot and a line plot. | 1 |
| 8.S.1.2 | Students are able to use a variety of visual representations to display data to make comparisons and predictions. <ul style="list-style-type: none"> • Double bar graph • Double line graph • Scatterplot | 2 |
| 8.S.2 | Apply the concepts of probability to predict events/outcomes and solve problems. | 2 |
| 8.S.2.1 | Students are able to find the sample space and compute probability for two simultaneous independent events. <ul style="list-style-type: none"> • Express probability as a ratio, decimal, or percent. | 2 |

Table 11.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 11

| Level | Description | DOK |
|------------|--|-----|
| 9-12.A | ALGEBRA | 2 |
| 9-12.A.1 | Use procedures to transform algebraic expressions. | 2 |
| 9-12.A.1.1 | Students are able to write equivalent forms of algebraic expressions using properties of the set of real numbers. <ul style="list-style-type: none"> Evaluate algebraic expressions. Use laws of exponents. Use conventional order of operations, including grouping and exponents. | 2 |
| 9-12.A.2 | Use a variety of algebraic concepts and methods to solve equations and inequalities. | 2 |
| 9-12.A.2.1 | Students are able to use algebraic properties to transform multi-step, single-variable, first-degree equations. | 1 |
| 9-12.A.2.2 | Students are able to use algebraic properties to transform multi-step, single-variable, first-degree inequalities and represent solutions using a number line. | 2 |
| 9-12.A.3 | Interpret and develop mathematical models. | 2 |
| 9-12.A.3.1 | Students are able to create linear models to represent problem situations. <ul style="list-style-type: none"> Calculate and interpret slope. | 2 |
| 9-12.A.3.2 | Students are able to distinguish between linear and nonlinear models. | 1 |
| 9-12.A.4 | Describe and use properties and behaviors of relations, functions, and inverses. | 2 |
| 9-12.A.4.1 | Students are able to use graphs, tables, and equations to represent linear functions. | 2 |
| 9-12.G | GEOMETRY | 2 |
| 9-12.G.1 | Use deductive and inductive reasoning to recognize and apply properties of geometric figures. | 2 |
| 9-12.G.1.1 | Students are able to apply the properties of triangles and quadrilaterals to find unknown parts. | 2 |
| 9-12.G.1.2 | Students are able to identify and apply relationships among triangles. <ul style="list-style-type: none"> Definitions and postulates Similarity theorems Congruence theorems | 2 |
| 9-12.G.2 | Use properties of geometric figures to solve problems from a variety of perspectives. | 2 |
| 9-12.G.2.1 | Students are able to recognize the relationship between a three-dimensional figure and its two-dimensional representation. <ul style="list-style-type: none"> Interpret floor plans Follow instructions for assembly of a product, e.g., “some assembly required.” | 2 |
| 9-12.G.2.2 | Students are able to reflect across vertical or horizontal lines, and translate two-dimensional figures. <ul style="list-style-type: none"> Identify lines of symmetry. Use the coordinate plane. | 1 |
| 9-12.G.2.3 | Students are able to use proportions to solve problems. | 2 |
| 9-12.M | MEASUREMENT | 1 |
| 9-12.M.1 | Apply measurement concepts in practical applications. | 1 |

Table 11.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 11

| Level | Description | DOK |
|------------|--|-----|
| 9-12.M.1.1 | Students are able to choose appropriate unit label, scale, and precision. <ul style="list-style-type: none"> Determine appropriate scales for histograms, scatterplots, and other graphs. | 2 |
| 9-12.M.1.2 | Students are able to use suitable units when describing rate of change. | 1 |
| 9-12.M.1.3 | Students are able to use formulas to find perimeter, circumference, and area to solve problems involving common geometric figures. <ul style="list-style-type: none"> Use algebraic expressions with geometric formulas. | 1 |
| 9-12.N | NUMBER SENSE | 1 |
| 9-12.N.1 | Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers. | 1 |
| 9-12.N.1.1 | Students are able to identify multiple representations of a real number. <ul style="list-style-type: none"> Given a real number identify the subset(s) of real numbers to which it belongs. Represent rational and irrational numbers in different forms. | 1 |
| 9-12.N.1.2 | Students are able to apply the concept of place value, magnitude, and relative magnitude of real numbers. <ul style="list-style-type: none"> Scientific notation Infinitely many solutions Completeness of the real numbers (density, i.e. between any two real numbers is another real number). | 1 |
| 9-12.N.2 | Apply number operations with real numbers and other number systems. | 1 |
| 9-12.N.2.1 | Students are able to add, subtract, multiply, and divide real numbers including integral exponents. | 1 |
| 9-12.N.3 | Develop conjectures, predictions, or estimations to solve problems and verify or justify the results. | 3 |
| 9-12.N.3.1 | Students are able to use estimation strategies in problem situations to predict results and to check the reasonableness of results. <ul style="list-style-type: none"> Use rounding as an estimation strategy. Use non-routine estimation strategies. | 2 |
| 9-12.N.3.2 | Students are able to select alternative computational strategies and explain the chosen strategy. <ul style="list-style-type: none"> Use properties of numbers that allow operational shortcuts for computational procedures. | 3 |
| 9-12.S | STATISTICS AND PROBABILITY | 2 |
| 9-12.S.1 | Use statistical models to gather, analyze, and display data to draw conclusions. | 3 |
| 9-12.S.1.1 | Students are able to draw conclusions from a set of data. <ul style="list-style-type: none"> Determine and use appropriate statistical values. Determine which questions can or cannot be answered from a given data set. | 3 |
| 9- | Students are able to compare multiple one-variable data sets, using range, interquartile | 2 |

Table 11.14
Group Consensus
South Dakota Math Content Standards, Mathematics, Grade 11

| Level | Description | DOK |
|------------|---|-----|
| 12.S.1.2 | range, mean, mode, and median. | |
| 9-12.S.1.3 | Represent a set of data in a variety of graphical forms and draw conclusions. <ul style="list-style-type: none"> • Make a scatterplot to draw a regression line and make predictions. • Make a box-and-whisker plot to model a set of one-variable data. • Make a histogram from a frequency distribution. | 3 |
| 9-12.S.2 | Apply the concepts of probability to predict events/outcomes and solve problems. | 2 |
| 9-12.S.2.1 | Students are able to distinguish between experimental and theoretical probability. | 1 |
| 9-12.S.2.2 | Students are able to predict outcomes of simple events using given theoretical probabilities. <ul style="list-style-type: none"> • Determine the sample space of an experiment. | 2 |

Appendix B

Data Analysis Tables

South Dakota Grades 3-8 and 11 Mathematics 2008

Brief Explanation of Data in the Alignment Tables by Column

Tables *grade.1*

| | |
|-------------------------|---|
| Standards # | Number of standards plus one for a generic standard for each standard. |
| Standards # | Average number of standards for reviewers. If the number is greater than the actual number in the standard, then at least one reviewer coded an item for the standard/standard but did not find any standard in the standard that corresponded to the item. |
| Level | The Depth-of-Knowledge level coded by the reviewers for the standards for each standard. |
| # of standards by Level | The number of standards coded at each level |
| % w/in std by Level | The percent of standards coded at each level |
| Hits | |
| Mean & SD | Mean and standard deviation number of items reviewers coded as corresponding to standard. The total is the total number of coded hits. |
| Cat. Conc. Accept. | “Yes” indicates that the standard met the acceptable level for criterion. “Yes” if mean is six or more. “Weak” if mean is five to six. “No” if mean is less than five. |

Tables *grade.2*

| | |
|----------------------------|--|
| | First five columns repeat columns from Table 1. |
| Level of Item w.r.t. Stand | Mean percent and standard deviation of items coded as “under” the Depth-of-Knowledge level of the corresponding standard, as “at” (the same) the Depth-of-Knowledge level of the corresponding standard, and as “above” the Depth-of-Knowledge level of the corresponding standard. |
| Depth-of-Know. Consistency | |
| Accept. | “Yes” indicates that 50% or more of the items were rated as “at” or “above” the Depth-of-Knowledge level of the corresponding standards. “Weak” indicates that 40% to 50% of the items were rated as “at” or “above” the Depth-of-Knowledge level of the corresponding standards. “No” indicates that less than 40% items were rated as “at” or “above” the Depth-of-Knowledge level of the corresponding standards. |

Tables *grade.3*

First five columns repeat columns from Table 1 and 2.

Range of Standards

Standards Hit Average number and standard deviation of the standards hit coded by reviewers.

% of Total Average percent and standard deviation of the total standards that had at least one item coded.

Range of Know.

Accept. “Yes” indicates that 50% or more of the standards had at least one coded standard.
 “Weak” indicates that 40% to 50% of the standards had at least one coded standard.
 “No” indicates that 40% or less of the standards had at least one coded standard.

Balance Index

% Hits in

Std/Ttl Hits Average and standard deviation of the percent of the items hit for a standard of total number of hits (see total under the Hits column).

Index Average and standard deviation of the Balance Index.

$$\text{Note: BALANCE INDEX} = 1 - \left(\sum_{k=1} | 1/(O) - I_{(k)} / (H) | \right) / 2$$

Where O = Total number of standards hit for the standard
 I_(k) = Number of items hit corresponding to standard (k)
 H = Total number of items hit for the standard

Bal. of Rep

Accept. “Yes” indicates that the Balance Index was .7 or above (items evenly distributed among standards).
 “Weak” indicates that the Balance Index was .6 to .7 (a high percentage of items coded as corresponding to two or three standards).
 “No” indicates that the Balance Index was .6 or less (a high percentage of items coded as corresponding to one standard.)

Tables *grade.4*

Summary if standard met the acceptable level for the four criteria by each standard.

Tables *grade.6*

The DOK value for each assessment item given by each reviewer. The intraclass correlation for the group of reviewers is given on the last row.

Tables *grade.8*

The DOK level and standard code assigned by each reviewer for each item.

Tables *grade.9*

This list for each item all of the standards coded by the group of reviewers as corresponding to the item. Repeat of a standard indicates the number of reviewers who coded that standard as corresponding to the item.

Tables *grade.10*

This lists for each standard all of the items coded by the group of reviewers as corresponding to the standard. Repeat of an item indicates the number of reviewers who coded the item as corresponding to the standard.

Tables *grade.12*

This table summarizes the number of reviewers who coded an item as corresponding to a standard. It contains the same information as in Table 10.

Tables *grade.13*

This table can be used to compare the DOK level of a standard to the average DOK level of the items reviewers assigned to the standard. This table is helpful to identify items with a lower DOK level that should be replaced by an item with a higher DOK level to improve the Depth-of-Knowledge Consistency.

Table 3.1
Categorical Concurrence Between Standards and Assessment as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 3
Number of Assessment Items - 84

| Standards | | | Level by Objective | | | Hits | | Cat. Concurr. |
|-------------------------------------|------------|-----------|--------------------|-----------------------|------------------------|-------|------|------------------|
| Title | Goals # | Objs # | Level | # of objs by Level | % w/in std by Level | Mean | S.D. | |
| 3.A - ALGEGRA | 4 | 7 | 1 2 | 2 5 | 28 71 | 26.71 | 1.58 | YES |
| 3.G - GEOMETRY | 2 | 3 | 1 2 | 2 1 | 66 33 | 14 | 0 | YES |
| 3.M - MEASUREMENT | 1 | 5 | 1 2 | 3 2 | 60 40 | 6.29 | 0.70 | YES |
| 3.N - NUMBER SENSE | 3 | 5 | 1 2 | 4 1 | 80 20 | 22.86 | 1.46 | YES |
| 3.S - STATISTICS AND PROBABILITY | 2 | 3 | 1 2 3 | 1 1 1 | 33 33 33 | 14.14 | 0.35 | YES |
| Total | 12 | 23 | 1 2 3 | 12 10 1 | 52 43 4 | 84 | 0 | |

Table 3.2a

Alternate Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Seven Reviewers (Does Not Assume Each Objective Should Have Equal Representation)

South Dakota Mathematics 2008 Grade 3

Number of Assessment Items - 84

| Standards | | | Hits | | Level of Item w.r.t. Standard | | | | | | DOK Consistency |
|----------------------------------|---------|--------|-------|------|-------------------------------|------|------|------|---------|------|-----------------|
| | | | | | % Under | | % At | | % Above | | |
| Title | Goals # | Objs # | M | S.D. | M | S.D. | M | S.D. | M | S.D. | |
| 3.A - ALGEBRA | 4 | 7 | 26.71 | 1.58 | 51 | 235 | 47 | 39 | 2 | 5 | WEAK |
| 3.G - GEOMETRY | 2 | 3 | 14 | 0 | 39 | 301 | 60 | 39 | 1 | 5 | YES |
| 3.M - MEASUREMENT | 1 | 5 | 6.29 | 0.70 | 42 | 96 | 58 | 42 | 0 | 0 | YES |
| 3.N - NUMBER SENSE | 3 | 5 | 22.86 | 1.46 | 13 | 137 | 67 | 36 | 20 | 26 | YES |
| 3.S - STATISTICS AND PROBABILITY | 2 | 3 | 14.14 | 0.35 | 37 | 266 | 57 | 45 | 6 | 13 | YES |
| Total | 12 | 23 | 84 | 0 | 34 | 42 | 62 | 41 | 4 | 15 | |

Table 3.3

Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Seven Reviewers

South Dakota Mathematics 2008 Grade 3

Number of Assessment Items - 84

| Standards | | | Hits | | Range of Objectives | | | | Rng. of Know. | Balance Index | | | | Bal. of Represent. |
|----------------------------------|---------|--------|-------|------|---------------------|------|------------|------|---------------|------------------------|------|-------|------|--------------------|
| | | | | | # Objs Hit | | % of Total | | | % Hits in Std/Ttl Hits | | Index | | |
| Title | Goals # | Objs # | Mean | S.D. | Mean | S.D. | Mean | S.D. | | Mean | S.D. | Mean | S.D. | |
| 3.A - ALGEBRA | 4 | 7 | 26.71 | 1.58 | 6.71 | 0.45 | 96 | 6 | YES | 32 | 2 | 0.85 | 0.04 | YES |
| 3.G - GEOMETRY | 2 | 3 | 14 | 0 | 3 | 0 | 100 | 0 | YES | 17 | 0 | 0.86 | 0.03 | YES |
| 3.M - MEASUREMENT | 1 | 5 | 6.29 | 0.70 | 4 | 0 | 80 | 0 | YES | 7 | 1 | 0.82 | 0.03 | YES |
| 3.N - NUMBER SENSE | 3 | 5 | 22.86 | 1.46 | 5 | 0 | 100 | 0 | YES | 27 | 2 | 0.75 | 0.04 | YES |
| 3.S - STATISTICS AND PROBABILITY | 2 | 3 | 14.14 | 0.35 | 3 | 0 | 100 | 0 | YES | 17 | 0 | 0.82 | 0.07 | YES |
| Total | 12 | 23 | 84 | 0 | 4.34 | 1.41 | 95 | 8 | | 20 | 9 | 0.82 | 0.06 | |

Table 3.4

Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 3
Number of Assessment Items - 84

| Standards | Alignment Criteria | | | |
|----------------------------------|-------------------------|--------------------------------|--------------------|---------------------------|
| | Categorical Concurrence | Depth-of-Knowledge Consistency | Range of Knowledge | Balance of Representation |
| 3.A - ALGEBRA | YES | WEAK | YES | YES |
| 3.G - GEOMETRY | YES | YES | YES | YES |
| 3.M - MEASUREMENT | YES | YES | YES | YES |
| 3.N - NUMBER SENSE | YES | YES | YES | YES |
| 3.S - STATISTICS AND PROBABILITY | YES | YES | YES | YES |

Table 3.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 3

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | 2 | 1 | 1 | 2 | 2 | 1 | 1 |
| 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 11 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | 1 | 2 | 1 | 2 | 2 | 1 | 1 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | 1 | 1 | 2 | 1 | 2 | 1 | 1 |
| 17 | 1 | 2 | 1 | 1 | 1 | 1 | 2 |
| 18 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 19 | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 20 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 21 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| 22 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 23 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 24 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 26 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 27 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| 28 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 29 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 30 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 31 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 32 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 33 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 34 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 35 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 36 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| 37 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 38 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 39 | 1 | 2 | 1 | 2 | 1 | 1 | 1 |
| 40 | | | | | | | |

Table 3.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 3

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 44 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 45 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 46 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 47 | 1 | 1 | 1 | 2 | 2 | 1 | 2 |
| 48 | 2 | 2 | 1 | 2 | 2 | 1 | 2 |
| 49 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 50 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 51 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 52 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 53 | 1 | 2 | 1 | 1 | 2 | 2 | 2 |
| 54 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 55 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 56 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 57 | 1 | 2 | 2 | 2 | 1 | 1 | 1 |
| 58 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 59 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 60 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| 61 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 62 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 63 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 64 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 65 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 66 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 67 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| 68 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 69 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| 70 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 71 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 72 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 73 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 74 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 75 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 76 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 77 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| 78 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 79 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 80 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |

Table 3.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 3

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 84 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 85 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 86 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 87 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 88 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 89 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 90 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 91 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 92 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Intraclass Correlation: 0.8483

Pairwise Comparison: 0.7959

Table 3.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 3

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 1 | 1 | 3.G.2.1 |
| 2 | 1 | 3.G.2.1 | 1 | 3.G.2.1 | 1 | 3.G.2.1 | 1 | 3.G.2.1 | 1 | 3.G.1.2 | 1 | 3.G.2.1 | 1 | 3.G.2.1 |
| 3 | 1 | 3.G.2.1 |
| 4 | 1 | 3.M.1.1 |
| 5 | 2 | 3.N.2.1 | 1 | 3.N.2.1 | 2 | 3.N.2.1 |
| 6 | 1 | 3.A.3.1 |
| 7 | 1 | 3.A.4.1 |
| 8 | 2 | 3.N.2.1 | 1 | 3.N.2.1 | 1 | 3.N.2.1 | 2 | 3.N.2.1 | 2 | 3.N.2.1 | 1 | 3.N.2.1 | 1 | 3.N.2.1 |
| 9 | 1 | 3.A.4.1 | 1 | 3.A.4.1 | 1 | 3.A.4.1 | 1 | 3.A.4.2 | 1 | 3.A.4.1 | 1 | 3.A.4.1 | 1 | 3.A.4.1 |
| 10 | 1 | 3.G.1.1 |
| 11 | 1 | 3.G.1.2 |
| 12 | 1 | 3.N.2.1 | 2 | 3.A.2.2 | 1 | 3.N.2.1 | 2 | 3.N.1.2 | 2 | 3.A.2.2 | 1 | 3.N.2.1 | 1 | 3.N.2.1 |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | 1 | 3.N.1.3 | 1 | 3.N.1.3 | 2 | 3.N.1.3 | 1 | 3.N.1.3 | 2 | 3.N.1.3 | 1 | 3.N.1.3 | 1 | 3.N.1.3 |
| 17 | 1 | 3.N.1.3 | 2 | 3.N.1.3 | 1 | 3.N.1.3 | 1 | 3.N.1.3 | 1 | 3.N.3.1 | 1 | 3.N.1.3 | 2 | 3.N.1.3 |
| 18 | 1 | 3.N.3.1 |
| 19 | 1 | 3.S.1.1 | 2 | 3.S.1.1 | 2 | 3.S.1.1 | 2 | 3.S.1.1 | 2 | 3.S.1.1 | 1 | 3.S.1.1 | 1 | 3.S.1.1 |
| 20 | 2 | 3.S.1.1 |
| 21 | 1 | 3.M.1.2 | 2 | 3.M.1.2 | 1 | 3.M.1.2 | 1 | 3.M.1.2 | 2 | 3.M.1.2 | 1 | 3.M.1.2 | 1 | 3.M.1.2 |
| 22 | 1 | 3.S.2.1 |
| 23 | 1 | 3.A.4.1 | 1 | 3.N.3.1 | 1 | 3.A.4.1 |
| 24 | 1 | 3.G.1.2 |
| 25 | 1 | 3.A.3.1 |
| 26 | 1 | 3.A.2.2 |
| 27 | 1 | 3.S.2.1 | 1 | 3.S.2.1 | 2 | 3.S.2.1 | 1 | 3.S.2.1 | 1 | 3.S.2.1 | 1 | 3.S.2.1 | 1 | 3.S.2.1 |
| 28 | 1 | 3.G.1.2 |
| 29 | 1 | 3.N.2.1 | 2 | 3.N.2.1 | 1 | 3.N.2.1 |
| 30 | 2 | 3.N.2.1 |
| 31 | 1 | 3.A.1.1 | 1 | 3.A.1.1 | 1 | 3.A.1.1 | 1 | 3.A.1.1 | 2 | 3.A.1.1 | 1 | 3.A.1.1 | 1 | 3.A.1.1 |
| 32 | 1 | 3.N.1.1 | 2 | 3.N.1.1 | 1 | 3.N.1.1 |
| 33 | 1 | 3.A.2.1 | 1 | 3.A.2.1 | 1 | 3.A.2.1 | 1 | 3.A.2.1 | 2 | 3.A.2.1 | 1 | 3.A.2.1 | 1 | 3.A.2.1 |
| 34 | 1 | 3.G.1.1 |
| 35 | 1 | 3.N.1.3 | 2 | 3.N.1.3 |
| 36 | 1 | 3.S.1.1 | 2 | 3.S.1.1 | 1 | 3.S.1.1 | 1 | 3.S.1.1 | 2 | 3.S.1.1 | 1 | 3.S.1.1 | 1 | 3.S.1.1 |
| 37 | 2 | 3.S.2.1 | 2 | 3.S.2.1 | 1 | 3.S.2.1 |
| 38 | 1 | 3.A.2.1 | 1 | 3.S.2.1 |

Table 3.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 3

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 39 | 1 | 3.N.3.1 | 2 | 3.N.3.1 | 1 | 3.N.3.1 | 2 | 3.N.3.1 | 1 | 3.N.3.1 | 1 | 3.N.3.1 | 1 | 3.N.3.1 |
| 40 | | | | | | | | | | | | | | |
| 41 | | | | | | | | | | | | | | |
| 42 | | | | | | | | | | | | | | |
| 43 | 1 | 3.S.2.1 | 2 | 3.S.2.1 | 1 | 3.S.2.1 | 1 | 3.S.2.1 | 1 | 3.S.2.1 | 1 | 3.S.1.2 | 1 | 3.S.2.1 |
| 44 | 1 | 3.N.3.1 |
| 45 | 1 | 3.M.1.4 | 1 | 3.M.1.4 | 1 | 3.M.1.4 | 1 | 3.M.1.4 | 2 | 3.M.1.4 | 1 | 3.M.1.4 | 1 | 3.M.1.4 |
| 46 | 1 | 3.S.2.1 | 1 | 3.S.1.2 | 1 | 3.S.2.1 |
| 47 | 1 | 3.A.1.1 | 1 | 3.A.1.1 | 1 | 3.A.1.1 | 2 | 3.A.1.1 | 2 | 3.A.1.1 | 1 | 3.A.1.1 | 2 | 3.A.1.1 |
| 48 | 2 | 3.G.2.1 | 2 | 3.G.2.1 | 1 | 3.G.2.1 | 2 | 3.G.2.1 | 2 | 3.G.2.1 | 1 | 3.G.2.1 | 2 | 3.G.2.1 |
| 49 | 1 | 3.A.1.2 |
| 50 | 1 | 3.A.3.1 | 1 | 3.A.3.1 | 1 | 3.A.3.1 | 2 | 3.A.3.1 | 1 | 3.A.3.1 | 1 | 3.A.3.1 | 1 | 3.A.3.1 |
| 51 | 1 | 3.G.1.2 | 1 | 3.G.1.1 | 1 | 3.G.1.2 | 1 | 3.G.1.2 | 1 | 3.G.1.2 | 1 | 3.G.1.2 | 2 | 3.G.1.2 |
| 52 | 2 | 3.M.1.2 |
| 53 | 1 | 3.A.2.1 | 2 | 3.A.2.1 | 1 | 3.A.2.1 | 1 | 3.A.2.1 | 2 | 3.A.2.1 | 2 | 3.A.2.1 | 2 | 3.A.2.1 |
| 54 | 2 | 3.S.1.2 |
| 55 | 1 | 3.N.1.2 |
| 56 | 1 | 3.A.1.1 | 1 | 3.A.1.1 | 1 | 3.A.1.1 | 2 | 3.A.1.1 | 1 | 3.A.1.1 | 1 | 3.A.1.1 | 1 | 3.A.1.1 |
| 57 | 1 | 3.A.4.2 | 2 | 3.A.4.2 | 2 | 3.A.4.2 | 2 | 3.N.2.1 | 1 | 3.A.4.2 | 1 | 3.N.1.2 | 1 | 3.N.2.1 |
| 58 | 1 | 3.A.4.1 | 1 | 3.A.4.1 | 1 | 3.A.4.1 | 1 | 3.A.4.2 | 1 | 3.A.4.1 | 1 | 3.A.4.1 | 1 | 3.N.1.2 |
| 59 | 1 | 3.N.1.2 | 1 | 3.A.1.1 | 1 | 3.N.1.2 | 1 | 3.N.1.2 | 2 | 3.A.4.2 | 1 | 3.A.2.2 | 1 | 3.N.1.2 |
| 60 | 2 | 3.S.1.2 | 2 | 3.S.1.1 | 1 | 3.S.1.1 | 1 | 3.S.1.2 | 2 | 3.S.1.1 | 1 | 3.S.1.2 | 1 | 3.S.1.1 |
| 61 | 1 | 3.N.3.1 | 2 | 3.N.3.1 | 1 | 3.N.3.1 |
| 62 | 1 | 3.N.1.3 | 1 | 3.N.1.3 | 1 | 3.N.1.3 | 1 | 3.N.1.3 | 2 | 3.N.1.3 | 1 | 3.N.1.3 | 1 | 3.N.1.3 |
| 63 | 1 | 3.G.2.1 |
| 64 | 1 | 3.N.2.1 | 2 | 3.N.2.1 | 1 | 3.A.2.2 |
| 65 | 1 | 3.N.3.1 |
| 66 | 2 | 3.S.1.2 | 2 | 3.S.1.2 | 2 | 3.S.1.2 | 2 | 3.S.1.2 | 2 | 3.S.1.1 | 2 | 3.S.1.2 | 2 | 3.S.1.1 |
| 67 | 1 | 3.G.2.1 | 2 | 3.G.2.1 | 1 | 3.G.2.1 | 1 | 3.G.2.1 | 2 | 3.G.2.1 | 1 | 3.G.2.1 | 1 | 3.G.2.1 |
| 68 | 1 | 3.M.1.2 | 1 | 3.A.3.1 | 1 | 3.N.1.2 | 1 | 3.A.3.1 | 1 | 3.N.2.1 | 1 | 3.A.3.1 | 1 | 3.A.3.1 |
| 69 | 2 | 3.A.4.1 | 2 | 3.A.4.1 | 1 | 3.A.4.1 | 1 | 3.A.4.1 | 2 | 3.A.4.1 | 1 | 3.A.4.1 | 1 | 3.A.4.1 |
| 70 | 1 | 3.A.1.1 |
| 71 | 1 | 3.M.1.2 | 1 | 3.A.3.1 | 1 | 3.N.1.2 | 1 | 3.A.3.1 | 1 | 3.N.2.1 | 1 | 3.A.3.1 | 1 | 3.A.3.1 |
| 72 | 1 | 3.S.2.1 | 2 | 3.S.2.1 | 1 | 3.S.2.1 |
| 73 | 2 | 3.A.2.2 | 1 | 3.A.2.2 | 2 | 3.A.2.2 |
| 74 | 2 | 3.N.2.1 | 1 | 3.N.2.1 | 2 | 3.N.2.1 |
| 75 | 1 | 3.N.3.1 | 2 | 3.N.3.1 | 1 | 3.N.3.1 |
| 76 | 1 | 3.G.1.1 |

Table 3.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 3

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 77 | 1 | 3.A.3.1 | 1 | 3.A.3.1 | 1 | 3.A.3.1 | 2 | 3.A.3.1 | 1 | 3.A.3.1 | 2 | 3.A.2.2 | 2 | 3.A.3.1 |
| 78 | 1 | 3.M.1.4 | 1 | 3.M.1.4 | 1 | 3.M.1.4 | 1 | 3.M.1.4 | 2 | 3.M.1.4 | 1 | 3.M.1.4 | 1 | 3.M.1.4 |
| 79 | 1 | 3.A.1.2 |
| 80 | 1 | 3.G.1.1 | 2 | 3.G.2.1 | 1 | 3.G.1.1 |
| 81 | | | | | | | | | | | | | | |
| 82 | | | | | | | | | | | | | | |
| 83 | 1 | 3.S.2.1 | 2 | 3.S.2.1 | 1 | 3.S.2.1 |
| 84 | 2 | 3.A.4.2 | 1 | 3.A.1.1 | 1 | 3.A.1.1 | 1 | 3.A.1.1 | 1 | 3.A.4.2 | 1 | 3.A.1.1 | 1 | 3.N.2.1 |
| 85 | 1 | 3.N.3.1 |
| 86 | 2 | 3.S.1.2 | 2 | 3.S.1.1 | 1 | 3.S.1.1 |
| 87 | 1 | 3.M.1.5 |
| 88 | 1 | 3.A.3.1 |
| 89 | 2 | 3.A.2.2 | 2 | 3.A.2.2 | 1 | 3.A.2.2 | 1 | 3.N.2.1 | 1 | 3.A.2.2 | 1 | 3.A.2.2 | 1 | 3.A.2.2 |
| 90 | 1 | 3.A.1.2 | 2 | 3.A.2.2 |
| 91 | 1 | 3.A.2.2 | 1 | 3.A.2.2 | 1 | 3.A.2.2 | 1 | 3.N.2.1 | 2 | 3.A.2.2 | 1 | 3.N.2.1 | 1 | 3.A.2.2 |
| 92 | 1 | 3.N.1.2 | 1 | 3.N.1.2 | 1 | 3.N.1.2 | 1 | 3.A.4.1 | 1 | 3.N.1.2 | 1 | 3.N.1.2 | 1 | 3.N.1.2 |

Objective Pairwise Comparison: 0.873
Standard Pairwise Comparison: 0.9354

Table 3.9
 Objectives Coded to Each Item by Reviewers
 South Dakota Mathematics 2008 Grade 3

| Low | | Medium | | High |
|-----|--|----------|--|------|
| 0 | | 6.391304 | | 7 |

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 1 3351226 | 3.G.2.1 |
| 2 3528046 | 3.G.1.2 | 3.G.2.1 | 3.G.2.1 | 3.G.2.1 | 3.G.2.1 | 3.G.2.1 | 3.G.2.1 |
| 3 2176941 | 3.G.2.1 |
| 4 2176949 | 3.M.1.1 |
| 5 3427068 | 3.N.2.1 |
| 6 2176979 | 3.A.3.1 |
| 7 3528467 | 3.A.4.1 |
| 8 2104973 | 3.N.2.1 |
| 9 3529121 | 3.A.4.1 | 3.A.4.1 | 3.A.4.1 | 3.A.4.1 | 3.A.4.1 | 3.A.4.1 | 3.A.4.2 |
| 10 3328607 | 3.G.1.1 |
| 11 3328617 | 3.G.1.2 |
| 12 2104978 | 3.A.2.2 | 3.A.2.2 | 3.N.1.2 | 3.N.2.1 | 3.N.2.1 | 3.N.2.1 | 3.N.2.1 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 2176958 | 3.N.1.3 |
| 17 3528162 | 3.N.1.3 | 3.N.1.3 | 3.N.1.3 | 3.N.1.3 | 3.N.1.3 | 3.N.1.3 | 3.N.3.1 |
| 18 3427064 | 3.N.3.1 |
| 19 3530552 | 3.S.1.1 |
| 20 2176989 | 3.S.1.1 |
| 21 2176972 | 3.M.1.2 |
| 22 3427071 | 3.S.2.1 |
| 23 2176987 | 3.A.4.1 | 3.A.4.1 | 3.A.4.1 | 3.A.4.1 | 3.A.4.1 | 3.A.4.1 | 3.N.3.1 |
| 24 3344689 | 3.G.1.2 |
| 25 2176926 | 3.A.3.1 |
| 26 3528476 | 3.A.2.2 |
| 27 3528688 | 3.S.2.1 |
| 28 2345751 | 3.G.1.2 |
| 29 2176946 | 3.N.2.1 |
| 30 2176966 | 3.N.2.1 |
| 31 3528475 | 3.A.1.1 |
| 32 3528132 | 3.N.1.1 |
| 33 3344686 | 3.A.2.1 |
| 34 3528033 | 3.G.1.1 |
| 35 2176956 | 3.N.1.3 |
| 36 3427067 | 3.S.1.1 |
| 37 3537250 | 3.S.2.1 |
| 38 3525574 | 3.A.2.1 | 3.A.2.1 | 3.A.2.1 | 3.A.2.1 | 3.A.2.1 | 3.A.2.1 | 3.S.2.1 |

Table 3.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 3

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 39 3528048 | 3.N.3.1 |
| 40 | | | | | | | |
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 3528676 | 3.S.1.2 | 3.S.2.1 | 3.S.2.1 | 3.S.2.1 | 3.S.2.1 | 3.S.2.1 | 3.S.2.1 |
| 44 3328564 | 3.N.3.1 |
| 45 2176950 | 3.M.1.4 |
| 46 3528687 | 3.S.1.2 | 3.S.2.1 | 3.S.2.1 | 3.S.2.1 | 3.S.2.1 | 3.S.2.1 | 3.S.2.1 |
| 47 2176903 | 3.A.1.1 |
| 48 3351228 | 3.G.2.1 |
| 49 2176909 | 3.A.1.2 |
| 50 3528731 | 3.A.3.1 |
| 51 2345752 | 3.G.1.1 | 3.G.1.2 | 3.G.1.2 | 3.G.1.2 | 3.G.1.2 | 3.G.1.2 | 3.G.1.2 |
| 52 3537228 | 3.M.1.2 |
| 53 3351210 | 3.A.2.1 |
| 54 3529262 | 3.S.1.2 |
| 55 3528172 | 3.N.1.2 |
| 56 3426897 | 3.A.1.1 |
| 57 3528161 | 3.A.4.2 | 3.A.4.2 | 3.A.4.2 | 3.A.4.2 | 3.N.1.2 | 3.N.2.1 | 3.N.2.1 |
| 58 3525572 | 3.A.4.1 | 3.A.4.1 | 3.A.4.1 | 3.A.4.1 | 3.A.4.1 | 3.A.4.2 | 3.N.1.2 |
| 59 3529153 | 3.A.1.1 | 3.A.2.2 | 3.A.4.2 | 3.N.1.2 | 3.N.1.2 | 3.N.1.2 | 3.N.1.2 |
| 60 3529201 | 3.S.1.1 | 3.S.1.1 | 3.S.1.1 | 3.S.1.1 | 3.S.1.2 | 3.S.1.2 | 3.S.1.2 |
| 61 3528051 | 3.N.3.1 |
| 62 2176969 | 3.N.1.3 |
| 63 3328560 | 3.G.2.1 |
| 64 3528169 | 3.A.2.2 | 3.N.2.1 | 3.N.2.1 | 3.N.2.1 | 3.N.2.1 | 3.N.2.1 | 3.N.2.1 |
| 65 3344693 | 3.N.3.1 |
| 66 3529224 | 3.S.1.1 | 3.S.1.1 | 3.S.1.2 | 3.S.1.2 | 3.S.1.2 | 3.S.1.2 | 3.S.1.2 |
| 67 3351223 | 3.G.2.1 |
| 68 2176976 | 3.A.3.1 | 3.A.3.1 | 3.A.3.1 | 3.A.3.1 | 3.M.1.2 | 3.N.1.2 | 3.N.2.1 |
| 69 3533641 | 3.A.4.1 |
| 70 3528474 | 3.A.1.1 |
| 71 2176973 | 3.A.3.1 | 3.A.3.1 | 3.A.3.1 | 3.A.3.1 | 3.M.1.2 | 3.N.1.2 | 3.N.2.1 |
| 72 3537270 | 3.S.2.1 |
| 73 2176911 | 3.A.2.2 |
| 74 2176964 | 3.N.2.1 |
| 75 3351233 | 3.N.3.1 |
| 76 2176933 | 3.G.1.1 |
| 77 2176919 | 3.A.2.2 | 3.A.3.1 | 3.A.3.1 | 3.A.3.1 | 3.A.3.1 | 3.A.3.1 | 3.A.3.1 |
| 78 3528044 | 3.M.1.4 |
| 79 3525575 | 3.A.1.2 |
| 80 3328559 | 3.G.1.1 | 3.G.1.1 | 3.G.2.1 | 3.G.2.1 | 3.G.2.1 | 3.G.2.1 | 3.G.2.1 |

Table 3.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 3

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 3528645 | 3.S.2.1 |
| 84 3529171 | 3.A.1.1 | 3.A.1.1 | 3.A.1.1 | 3.A.1.1 | 3.A.4.2 | 3.A.4.2 | 3.N.2.1 |
| 85 3351231 | 3.N.3.1 |
| 86 2176988 | 3.S.1.1 | 3.S.1.1 | 3.S.1.1 | 3.S.1.1 | 3.S.1.1 | 3.S.1.1 | 3.S.1.2 |
| 87 3526951 | 3.M.1.5 |
| 88 2176921 | 3.A.3.1 |
| 89 3528482 | 3.A.2.2 | 3.A.2.2 | 3.A.2.2 | 3.A.2.2 | 3.A.2.2 | 3.A.2.2 | 3.N.2.1 |
| 90 3525576 | 3.A.1.2 | 3.A.1.2 | 3.A.1.2 | 3.A.1.2 | 3.A.1.2 | 3.A.1.2 | 3.A.2.2 |
| 91 3525573 | 3.A.2.2 | 3.A.2.2 | 3.A.2.2 | 3.A.2.2 | 3.A.2.2 | 3.N.2.1 | 3.N.2.1 |
| 92 3528485 | 3.A.4.1 | 3.N.1.2 | 3.N.1.2 | 3.N.1.2 | 3.N.1.2 | 3.N.1.2 | 3.N.1.2 |

Table 3.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 3

| Low | | Medium | | High | | | | | | | | | | | | | | | |
|---------|---|----------|---|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 14.34146 | | 53 | | | | | | | | | | | | | | | |
| 3.A | | | | | | | | | | | | | | | | | | | |
| 3.A.1 | | | | | | | | | | | | | | | | | | | |
| 3.A.1.1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 6 |
| | 5 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | | | | | | |
| | 6 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 4 | 4 | | | | | | |
| 3.A.1.2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | 9 | 9 | 9 | 9 |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 |
| 3.A.2 | | | | | | | | | | | | | | | | | | | |
| 3.A.2.1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 8 | 8 | 8 | 8 | 8 | 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| 3.A.2.2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 |
| | 2 | 2 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 9 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 |
| | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | | | | | | | | 9 |
| | 9 | 9 | 9 | 9 | 9 | 0 | 1 | 1 | 1 | 1 | 1 | | | | | | | | |
| 3.A.3 | | | | | | | | | | | | | | | | | | | |
| 3.A.3.1 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 5 | 5 | 5 | 5 |
| | | | | | | | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 |
| | 0 | 8 | 8 | 8 | 8 | 1 | 1 | 1 | 1 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 |
| | 8 | 8 | 8 | | | | | | | | | | | | | | | | |
| | 8 | 8 | 8 | | | | | | | | | | | | | | | | |
| 3.A.4 | | | | | | | | | | | | | | | | | | | |
| 3.A.4.1 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 2 | 2 | 2 | 2 | 2 |
| | | | | | | | | | | | | | | | 3 | 3 | 3 | 3 | 3 |
| | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 9 | | | | | | | |
| | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 2 | | | | | | | |
| 3.A.4.2 | 9 | 5 | 5 | 5 | 5 | 5 | 5 | 8 | 8 | | | | | | | | | | |
| | | 7 | 7 | 7 | 7 | 8 | 9 | 4 | 4 | | | | | | | | | | |
| 3.G | | | | | | | | | | | | | | | | | | | |
| 3.G.1 | | | | | | | | | | | | | | | | | | | |
| 3.G.1.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 7 | 7 | 7 | 7 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 1 | 6 | 6 | 6 | 6 |
| | 7 | 7 | 8 | 8 | | | | | | | | | | | | | | | |
| | 6 | 6 | 0 | 0 | | | | | | | | | | | | | | | |
| 3.G.1.2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 8 | 8 | 8 | 8 |

Table 3.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 3

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|--|
| | 2 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | | | | | | | | | | | | | | | |
| | 8 | 8 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 3.G.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.G.2.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | | | | |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | |
| | 6 | 6 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | | | | | | | | | | | |
| | 7 | 7 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | |
| 3.M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.M.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.M.1.1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | |
| 3.M.1.2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 7 | | | | | | | | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 8 | 1 | | | | | | | | | | | | | | |
| 3.M.1.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.M.1.4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | | | | | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | | | | |
| 3.M.1.5 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | | | | | | | | | | | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | | | | | | | | | | | | |
| 3.N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.N.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.N.1.1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| 3.N.1.2 | 1 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 7 | 9 | 9 | 9 | 9 | | | | | | | | | | |
| | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 8 | 9 | 9 | 9 | 8 | 1 | 2 | 2 | 2 | 2 | | | | | | | | | | |
| | 9 | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.N.1.3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | | | |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| 3.N.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.N.2.1 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 1 | 1 | 1 | 1 | 2 | 2 | | | | | | | | | | |
| | | | | | | | | | | | | | | | 2 | 2 | 2 | 2 | 9 | 9 | | | | | | | | | | |
| | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | | | | |
| | 9 | 9 | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | |
| | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 9 | 9 | | | | | | | | | | | | | | | | | |
| | 4 | 8 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 9 | 1 | 1 | | | | | | | | | | | | | | | | |
| 3.N.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.N.3.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | | | | | | | | | | |
| | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 3 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 4 | 4 | 4 | 4 | | | | | | | | | | |

Table 3.10
Items Coded by Reviewers to Each Objective
South Dakota Mathematics 2008 Grade 3

| | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | | |
| | 4 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | |
| | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | |
| 3.S | | | | | | | | | | | | | | | | | | | | |
| 3.S.1 | | | | | | | | | | | | | | | | | | | | |
| 3.S.1.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 3 | 6 | 6 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | |
| | 6 | 0 | 0 | 0 | 0 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | |
| 3.S.1.2 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 8 | |
| | 3 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| 3.S.2 | | | | | | | | | | | | | | | | | | | | |
| 3.S.2.1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 7 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | |
| | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | |

Table 3.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 3

| Low | | Medium | | High | | | | | | | | | |
|---------|------|--------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | | 3 | | 7 | | | | | | | | | |
| 3.A | | | | | | | | | | | | | |
| 3.A.1 | | | | | | | | | | | | | |
| 3.A.1.1 | 31:7 | 47:7 | 56:7 | 59:1 | 70:7 | 84:4 | | | | | | | |
| 3.A.1.2 | 49:7 | 79:7 | 90:6 | | | | | | | | | | |
| 3.A.2 | | | | | | | | | | | | | |
| 3.A.2.1 | 33:7 | 38:6 | 53:7 | | | | | | | | | | |
| 3.A.2.2 | 12:2 | 26:7 | 59:1 | 64:1 | 73:7 | 77:1 | 89:6 | 90:1 | 91:5 | | | | |
| 3.A.3 | | | | | | | | | | | | | |
| 3.A.3.1 | 6:7 | 25:7 | 50:7 | 68:4 | 71:4 | 77:6 | 88:7 | | | | | | |
| 3.A.4 | | | | | | | | | | | | | |
| 3.A.4.1 | 7:7 | 9:6 | 23:6 | 58:5 | 69:7 | 92:1 | | | | | | | |
| 3.A.4.2 | 9:1 | 57:4 | 58:1 | 59:1 | 84:2 | | | | | | | | |
| 3.G | | | | | | | | | | | | | |
| 3.G.1 | | | | | | | | | | | | | |
| 3.G.1.1 | 10:7 | 34:7 | 51:1 | 76:7 | 80:2 | | | | | | | | |
| 3.G.1.2 | 2:1 | 11:7 | 24:7 | 28:7 | 51:6 | | | | | | | | |
| 3.G.2 | | | | | | | | | | | | | |
| 3.G.2.1 | 1:7 | 2:6 | 3:7 | 48:7 | 63:7 | 67:7 | 80:5 | | | | | | |
| 3.M | | | | | | | | | | | | | |
| 3.M.1 | | | | | | | | | | | | | |
| 3.M.1.1 | 4:7 | | | | | | | | | | | | |
| 3.M.1.2 | 21:7 | 52:7 | 68:1 | 71:1 | | | | | | | | | |
| 3.M.1.3 | | | | | | | | | | | | | |
| 3.M.1.4 | 45:7 | 78:7 | | | | | | | | | | | |
| 3.M.1.5 | 87:7 | | | | | | | | | | | | |
| 3.N | | | | | | | | | | | | | |
| 3.N.1 | | | | | | | | | | | | | |
| 3.N.1.1 | 32:7 | | | | | | | | | | | | |
| 3.N.1.2 | 12:1 | 55:7 | 57:1 | 58:1 | 59:4 | 68:1 | 71:1 | 92:6 | | | | | |
| 3.N.1.3 | 16:7 | 17:6 | 35:7 | 62:7 | | | | | | | | | |
| 3.N.2 | | | | | | | | | | | | | |
| 3.N.2.1 | 5:7 | 8:7 | 12:4 | 29:7 | 30:7 | 57:2 | 64:6 | 68:1 | 71:1 | 74:7 | 84:1 | 89:1 | 91:2 |
| 3.N.3 | | | | | | | | | | | | | |
| 3.N.3.1 | 17:1 | 18:7 | 23:1 | 39:7 | 44:7 | 61:7 | 65:7 | 75:7 | 85:7 | | | | |
| 3.S | | | | | | | | | | | | | |
| 3.S.1 | | | | | | | | | | | | | |
| 3.S.1.1 | 19:7 | 20:7 | 36:7 | 60:4 | 66:2 | 86:6 | | | | | | | |
| 3.S.1.2 | 43:1 | 46:1 | 54:7 | 60:3 | 66:5 | 86:1 | | | | | | | |

Table 3.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
South Dakota Mathematics 2008 Grade 3

| | | | | | | | | |
|---------|------|------|------|------|------|------|------|------|
| 3.S.2 | | | | | | | | |
| 3.S.2.1 | 22:7 | 27:7 | 37:7 | 38:1 | 43:6 | 46:6 | 72:7 | 83:7 |

Table 3.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 3

| Low | | Medium | | High |
|-----|--|--------|--|------|
| 1 | | 3 | | 7 |

| | | | |
|------------|-----------|-----------|-----------|
| 1 3351226 | 3.G.2.1:7 | | |
| 2 3528046 | 3.G.1.2:1 | 3.G.2.1:6 | |
| 3 2176941 | 3.G.2.1:7 | | |
| 4 2176949 | 3.M.1.1:7 | | |
| 5 3427068 | 3.N.2.1:7 | | |
| 6 2176979 | 3.A.3.1:7 | | |
| 7 3528467 | 3.A.4.1:7 | | |
| 8 2104973 | 3.N.2.1:7 | | |
| 9 3529121 | 3.A.4.1:6 | 3.A.4.2:1 | |
| 10 3328607 | 3.G.1.1:7 | | |
| 11 3328617 | 3.G.1.2:7 | | |
| 12 2104978 | 3.A.2.2:2 | 3.N.1.2:1 | 3.N.2.1:4 |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 2176958 | 3.N.1.3:7 | | |
| 17 3528162 | 3.N.1.3:6 | 3.N.3.1:1 | |
| 18 3427064 | 3.N.3.1:7 | | |
| 19 3530552 | 3.S.1.1:7 | | |
| 20 2176989 | 3.S.1.1:7 | | |
| 21 2176972 | 3.M.1.2:7 | | |
| 22 3427071 | 3.S.2.1:7 | | |
| 23 2176987 | 3.A.4.1:6 | 3.N.3.1:1 | |
| 24 3344689 | 3.G.1.2:7 | | |
| 25 2176926 | 3.A.3.1:7 | | |
| 26 3528476 | 3.A.2.2:7 | | |
| 27 3528688 | 3.S.2.1:7 | | |
| 28 2345751 | 3.G.1.2:7 | | |
| 29 2176946 | 3.N.2.1:7 | | |
| 30 2176966 | 3.N.2.1:7 | | |
| 31 3528475 | 3.A.1.1:7 | | |
| 32 3528132 | 3.N.1.1:7 | | |
| 33 3344686 | 3.A.2.1:7 | | |
| 34 3528033 | 3.G.1.1:7 | | |
| 35 2176956 | 3.N.1.3:7 | | |
| 36 3427067 | 3.S.1.1:7 | | |
| 37 3537250 | 3.S.2.1:7 | | |
| 38 3525574 | 3.A.2.1:6 | 3.S.2.1:1 | |

Table 3.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 3

| | | | | | |
|------------|-----------|-----------|-----------|-----------|--|
| 39 3528048 | 3.N.3.1:7 | | | | |
| 40 | | | | | |
| 41 | | | | | |
| 42 | | | | | |
| 43 3528676 | 3.S.1.2:1 | 3.S.2.1:6 | | | |
| 44 3328564 | 3.N.3.1:7 | | | | |
| 45 2176950 | 3.M.1.4:7 | | | | |
| 46 3528687 | 3.S.1.2:1 | 3.S.2.1:6 | | | |
| 47 2176903 | 3.A.1.1:7 | | | | |
| 48 3351228 | 3.G.2.1:7 | | | | |
| 49 2176909 | 3.A.1.2:7 | | | | |
| 50 3528731 | 3.A.3.1:7 | | | | |
| 51 2345752 | 3.G.1.1:1 | 3.G.1.2:6 | | | |
| 52 3537228 | 3.M.1.2:7 | | | | |
| 53 3351210 | 3.A.2.1:7 | | | | |
| 54 3529262 | 3.S.1.2:7 | | | | |
| 55 3528172 | 3.N.1.2:7 | | | | |
| 56 3426897 | 3.A.1.1:7 | | | | |
| 57 3528161 | 3.A.4.2:4 | 3.N.1.2:1 | 3.N.2.1:2 | | |
| 58 3525572 | 3.A.4.1:5 | 3.A.4.2:1 | 3.N.1.2:1 | | |
| 59 3529153 | 3.A.1.1:1 | 3.A.2.2:1 | 3.A.4.2:1 | 3.N.1.2:4 | |
| 60 3529201 | 3.S.1.1:4 | 3.S.1.2:3 | | | |
| 61 3528051 | 3.N.3.1:7 | | | | |
| 62 2176969 | 3.N.1.3:7 | | | | |
| 63 3328560 | 3.G.2.1:7 | | | | |
| 64 3528169 | 3.A.2.2:1 | 3.N.2.1:6 | | | |
| 65 3344693 | 3.N.3.1:7 | | | | |
| 66 3529224 | 3.S.1.1:2 | 3.S.1.2:5 | | | |
| 67 3351223 | 3.G.2.1:7 | | | | |
| 68 2176976 | 3.A.3.1:4 | 3.M.1.2:1 | 3.N.1.2:1 | 3.N.2.1:1 | |
| 69 3533641 | 3.A.4.1:7 | | | | |
| 70 3528474 | 3.A.1.1:7 | | | | |
| 71 2176973 | 3.A.3.1:4 | 3.M.1.2:1 | 3.N.1.2:1 | 3.N.2.1:1 | |
| 72 3537270 | 3.S.2.1:7 | | | | |
| 73 2176911 | 3.A.2.2:7 | | | | |
| 74 2176964 | 3.N.2.1:7 | | | | |
| 75 3351233 | 3.N.3.1:7 | | | | |
| 76 2176933 | 3.G.1.1:7 | | | | |
| 77 2176919 | 3.A.2.2:1 | 3.A.3.1:6 | | | |
| 78 3528044 | 3.M.1.4:7 | | | | |
| 79 3525575 | 3.A.1.2:7 | | | | |
| 80 3328559 | 3.G.1.1:2 | 3.G.2.1:5 | | | |

Table 3.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
South Dakota Mathematics 2008 Grade 3

| | | | |
|------------|-----------|-----------|-----------|
| 81 | | | |
| 82 | | | |
| 83 3528645 | 3.S.2.1:7 | | |
| 84 3529171 | 3.A.1.1:4 | 3.A.4.2:2 | 3.N.2.1:1 |
| 85 3351231 | 3.N.3.1:7 | | |
| 86 2176988 | 3.S.1.1:6 | 3.S.1.2:1 | |
| 87 3526951 | 3.M.1.5:7 | | |
| 88 2176921 | 3.A.3.1:7 | | |
| 89 3528482 | 3.A.2.2:6 | 3.N.2.1:1 | |
| 90 3525576 | 3.A.1.2:6 | 3.A.2.2:1 | |
| 91 3525573 | 3.A.2.2:5 | 3.N.2.1:2 | |
| 92 3528485 | 3.A.4.1:1 | 3.N.1.2:6 | |

Table 3.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 3

| | | | | | | | | | |
|---------------------|--------------------|--------------------|-------------|--------------------|--------------------|--------------------|---------------|------|--|
| 1 [1]: | | | | | | | | | |
| 3.G. 1.1 [1]: | 10:7 [1] | 34:7 [1] | 51:1 [1] | 76:7 [1] | 80:2 [1] | | | | |
| 3.G. 1.2 [1]: | 2:1[1] | 11:7 [1] | 24:7 [1] | 28:7 [1] | 51:6 [1.1 7] | | | | |
| 3.G. 2 [2]: | | | | | | | | | |
| 3.G. 2.1 [2]: | 1:7[1] | 2:6[1] | 3:7[1] | 48:7 [1.7 1] | 63:7 [1] | 67:7 [1.2 9] | 80:5 [1.2] | | |
| 3.M [1]: | | | | | | | | | |
| 3.M. 1 [1]: | | | | | | | | | |
| 3.M. 1.1 [1]: | 4:7[1] | | | | | | | | |
| 3.M. 1.2 [2]: | 21:7 [1.2 9] | 52:7 [2] | 68:1 [1] | 71:1 [1] | | | | | |
| 3.M. 1.3 [1]: | | | | | | | | | |
| 3.M. 1.4 [2]: | 45:7 [1.1 4] | 78:7 [1.1 4] | | | | | | | |
| 3.M. 1.5 [1]: | 87:7 [1] | | | | | | | | |
| 3.N [1]: | | | | | | | | | |
| 3.N. 1 [1]: | | | | | | | | | |
| 3.N. 1.1 [1]: | 32:7 [1.1 4] | | | | | | | | |
| 3.N. | 12:1 | 55:7 | 57:1 | 58:1 | 59:4 | 68:1 | 71:1 | 92:6 | |

Table 3.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 3

| | | | | | | | | | | | | | |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|--------------------|-------------|-------------|-------------|
| 1.2 [1]: | [2] | [1] | [1] | [1] | [1] | [1] | [1] | [1] | [1] | [1] | [1] | [1] | [1] |
| 3.N. 1.3 [2]: | 16:7 [1.2 9] | 17:6 [1.3 3] | 35:7 [1.1 4] | 62:7 [1.1 4] | | | | | | | | | |
| 3.N. 2 [1]: | | | | | | | | | | | | | |
| 3.N. 2.1 [1]: | 5:7 1.86 [1] | 8:7 1.43 [1] | 12:4 [1] | 29:7 [1.1 4] | 30:7 [2] | 57:2 [1.5] | 64:6 [1.1 7] | 68:1 [1] | 71:1 [1] | 74:7 [1.8 6] | 84:1 [1] | 89:1 [1] | 91:2 [1] |
| 3.N. 3 [1]: | | | | | | | | | | | | | |
| 3.N. 3.1 [1]: | 17:1 [1] | 18:7 [1] | 23:1 [1] | 39:7 [1.2 9] | 44:7 [1] | 61:7 [1.1 4] | 65:7 [1] | 75:7 [1.1 4] | 85:7 [1] | | | | |
| 3.S [2]: | | | | | | | | | | | | | |
| 3.S. 1 [3]: | | | | | | | | | | | | | |
| 3.S. 1.1 [3]: | 19:7 [1.5 7] | 20:7 [2] | 36:7 [1.2 9] | 60:4 [1.5] | 66:2 [2] | 86:6 [1.8 3] | | | | | | | |
| 3.S. 1.2 [2]: | 43:1 [1] | 46:1 [1] | 54:7 [2] | 60:3 [1.3 3] | 66:5 [2] | 86:1 [2] | | | | | | | |
| 3.S. 2 [1]: | | | | | | | | | | | | | |
| 3.S. 2.1 [1]: | 22:7 [1] | 27:7 [1.1 4] | 37:7 [1.2 9] | 38:1 [1] | 43:6 [1.1 7] | 46:6 [1] | 72:7 [1.1 4] | 83:7 [1.1 4] | | | | | |

Table 4.1
Categorical Concurrence Between Standards and Assessment as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 4
Number of Assessment Items - 84

| Standards | | | Level by Objective | | | Hits | | Cat. Concurr. |
|----------------------------------|---------|--------|--------------------|--------------------|---------------------|-------|------|---------------|
| Title | Goals # | Objs # | Level | # of objs by Level | % w/in std by Level | Mean | S.D. | |
| 4.A - ALGEBRA | 4 | 7 | 1 2 | 5 2 | 71 28 | 26.29 | 0.45 | YES |
| 4.G - GEOMETRY | 2 | 5 | 1 2 | 3 1 | 75 25 | 13.86 | 0.35 | YES |
| 4.M - MEASUREMENT | 1 | 4 | 1 2 | 2 2 | 50 50 | 9.57 | 1.05 | YES |
| 4.N - NUMBER SENSE | 3 | 8.43 | 1 2 | 5 2 | 71 28 | 21.29 | 1.39 | YES |
| 4.S - STATISTICS AND PROBABILITY | 2 | 4 | 1 2 3 | 1 1 1 | 33 33 33 | 13 | 0 | YES |
| Total | 12 | 28.43 | 1 2 3 | 16 8 1 | 64 32 4 | 84 | 0 | |

Table 4.2a

Alternate Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Seven Reviewers (Does Not Assume Each Objective Should Have Equal Representation)

South Dakota Mathematics 2008 Grade 4

Number of Assessment Items - 84

| Standards | | | Hits | | Level of Item w.r.t. Standard | | | | | | DOK Consistency |
|----------------------------------|---------|--------|-------|------|-------------------------------|------|------|------|---------|------|-----------------|
| | | | | | % Under | | % At | | % Above | | |
| Title | Goals # | Objs # | M | S.D. | M | S.D. | M | S.D. | M | S.D. | |
| 4.A - ALGEBRA | 4 | 7 | 26.29 | 0.45 | 22 | 170 | 67 | 26 | 11 | 19 | YES |
| 4.G - GEOMETRY | 2 | 5 | 13.86 | 0.35 | 7 | 48 | 81 | 26 | 11 | 23 | YES |
| 4.M - MEASUREMENT | 1 | 4 | 9.57 | 1.05 | 35 | 120 | 58 | 38 | 7 | 19 | YES |
| 4.N - NUMBER SENSE | 3 | 8.43 | 21.29 | 1.39 | 20 | 123 | 75 | 30 | 5 | 15 | YES |
| 4.S - STATISTICS AND PROBABILITY | 2 | 4 | 13 | 0 | 63 | 233 | 35 | 40 | 2 | 11 | NO |
| Total | 12 | 28.43 | 84 | 0 | 23 | 36 | 70 | 36 | 8 | 18 | |

Table 4.3

Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Seven Reviewers

South Dakota Mathematics 2008 Grade 4

Number of Assessment Items - 84

| Standards | | | Hits | | Range of Objectives | | | | Rng. of Know. | Balance Index | | | | Bal. of Represent. |
|----------------------------------|---------|--------|-------|------|---------------------|------|------------|------|---------------|------------------------|------|-------|------|--------------------|
| | | | | | # Objs Hit | | % of Total | | | % Hits in Std/Ttl Hits | | Index | | |
| Title | Goals # | Objs # | Mean | S.D. | Mean | S.D. | Mean | S.D. | | Mean | S.D. | Mean | S.D. | |
| 4.A - ALGEBRA | 4 | 7 | 26.29 | 0.45 | 7 | 0 | 100 | 0 | YES | 31 | 1 | 0.80 | 0.01 | YES |
| 4.G - GEOMETRY | 2 | 5 | 13.86 | 0.35 | 5 | 0 | 100 | 0 | YES | 16 | 0 | 0.84 | 0.03 | YES |
| 4.M - MEASUREMENT | 1 | 4 | 9.57 | 1.05 | 4 | 0 | 100 | 0 | YES | 11 | 1 | 0.78 | 0.05 | YES |
| 4.N - NUMBER SENSE | 3 | 8.43 | 21.29 | 1.39 | 8.14 | 0.35 | 97 | 5 | YES | 25 | 2 | 0.77 | 0.03 | YES |
| 4.S - STATISTICS AND PROBABILITY | 2 | 4 | 13 | 0 | 4 | 0 | 100 | 0 | YES | 15 | 0 | 0.71 | 0.01 | YES |
| Total | 12 | 28.43 | 84 | 0 | 5.63 | 1.67 | 99 | 3 | | 20 | 7 | 0.78 | 0.05 | |

Table 4.4

Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 4
Number of Assessment Items - 84

| Standards | Alignment Criteria | | | |
|----------------------------------|-------------------------|--------------------------------|--------------------|---------------------------|
| | Categorical Concurrence | Depth-of-Knowledge Consistency | Range of Knowledge | Balance of Representation |
| 4.A - ALGEBRA | YES | YES | YES | YES |
| 4.G - GEOMETRY | YES | YES | YES | YES |
| 4.M - MEASUREMENT | YES | YES | YES | YES |
| 4.N - NUMBER SENSE | YES | YES | YES | YES |
| 4.S - STATISTICS AND PROBABILITY | YES | NO | YES | YES |

Table 4.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 4

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 6 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| 7 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 11 | 1 | 1 | 2 | 1 | 2 | 1 | 1 |
| 12 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | 1 | 1 | 2 | 1 | 1 | 1 | 2 |
| 17 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 18 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 19 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 20 | 1 | 2 | 2 | 1 | 2 | 2 | 2 |
| 21 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 22 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 23 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 24 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 26 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 27 | 2 | 2 | 1 | 1 | 1 | 2 | 2 |
| 28 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 29 | 1 | 2 | 2 | 1 | 1 | 2 | 1 |
| 30 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 31 | 2 | 2 | 1 | 1 | 2 | 2 | 2 |
| 32 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 33 | 2 | 2 | 1 | 1 | 1 | 1 | 2 |
| 34 | 2 | 2 | 2 | 2 | 1 | 1 | 2 |
| 35 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 36 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 37 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 38 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 39 | 2 | 2 | 1 | 1 | 2 | 1 | 2 |
| 40 | | | | | | | |

Table 4.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 4

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 44 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 45 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 46 | 2 | 2 | 2 | 1 | 1 | 1 | 2 |
| 47 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| 48 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| 49 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 50 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 51 | 2 | 2 | 2 | 1 | 2 | 1 | 2 |
| 52 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 53 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 54 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| 55 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 56 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 57 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 58 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 59 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 60 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 61 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 62 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 63 | 2 | 2 | 1 | 1 | 1 | 1 | 2 |
| 64 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 65 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 66 | 1 | 1 | 2 | 1 | 1 | 1 | 2 |
| 67 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 68 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 69 | 1 | 2 | 1 | 1 | 1 | 1 | 2 |
| 70 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 71 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 72 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 73 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| 74 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 75 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 76 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 77 | 1 | 2 | 1 | 1 | 2 | 1 | 2 |
| 78 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| 79 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 80 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Table 4.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 4

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 84 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| 85 | 1 | 2 | 1 | 1 | 1 | 1 | 2 |
| 86 | 2 | 1 | 2 | 1 | 1 | 1 | 1 |
| 87 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 88 | 2 | 2 | 2 | 1 | 2 | 1 | 1 |
| 89 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 90 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 91 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 92 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Intraclass Correlation: 0.8695

Pairwise Comparison: 0.7789

Table 4.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 4

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 1 | 1 | 4.A.2.2 |
| 2 | 1 | 4.N.1.1 |
| 3 | 2 | 4.A.4.1 |
| 4 | 1 | 4.G.1.2 |
| 5 | 1 | 4.N.1 | 1 | 4.N.1 | 1 | 4.N.1 | 1 | 4.N.1 | 1 | 4.N.3 | 1 | 4.N.1 | 1 | 4.N.1 |
| 6 | 2 | 4.N.1.3 | 1 | 4.N.1.3 | 2 | 4.N.1.3 | 2 | 4.N.1.3 | 2 | 4.N.1.3 | 1 | 4.N.1.3 | 2 | 4.N.1.3 |
| 7 | 1 | 4.S.2.1 | 1 | 4.S.2.1 | 1 | 4.S.2.1 | 2 | 4.S.1.1 | 1 | 4.S.2.1 | 1 | 4.S.2.1 | 1 | 4.S.2.1 |
| 8 | 1 | 4.A.1.3 |
| 9 | 1 | 4.A.1.1 | 1 | 4.A.1.1 | 1 | 4.A.1.1 | 2 | 4.A.1.1 | 1 | 4.A.1.1 | 1 | 4.A.1.1 | 2 | 4.A.1.1 |
| 10 | 1 | 4.G.1.2 |
| 11 | 1 | 4.M.1.3 | 1 | 4.M.1.3 | 2 | 4.M.1.3 | 1 | 4.M.1.3 | 2 | 4.M.1.3 | 1 | 4.M.1.3 | 1 | 4.M.1.3 |
| 12 | 1 | 4.N.1 |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | 1 | 4.M.1.2 | 1 | 4.M.1.2 | 2 | 4.M.1.2 | 1 | 4.M.1.2 | 1 | 4.M.1.2 | 1 | 4.M.1.2 | 2 | 4.M.1.2 |
| 17 | 1 | 4.M.1.4 |
| 18 | 1 | 4.N.1.1 |
| 19 | 1 | 4.S.1.1 | 2 | 4.S.1.1 |
| 20 | 1 | 4.S.1.1 | 2 | 4.S.1.1 | 2 | 4.S.1.1 | 1 | 4.S.1.1 | 2 | 4.S.1.1 | 2 | 4.S.1.1 | 2 | 4.S.1.1 |
| 21 | 2 | 4.M.1.2 | 1 | 4.M.1.2 | 1 | 4.M.1.2 |
| 22 | 1 | 4.N.2.2 |
| 23 | 1 | 4.A.2.1 |
| 24 | 2 | 4.M.1.2 | 2 | 4.A.4.1 | 2 | 4.M.1.2 | 2 | 4.M.1.2 | 2 | 4.M.1.2 | 1 | 4.M.1.2 | 2 | 4.M.1.2 |
| 25 | 1 | 4.N.2.1 |
| 26 | 2 | 4.S.2.1 | 1 | 4.S.2.1 |
| 27 | 2 | 4.A.4.1 | 2 | 4.N.2.1 | 1 | 4.A.4.1 | 1 | 4.A.4.1 | 1 | 4.A.4.1 | 2 | 4.A.4.1 | 2 | 4.A.4.1 |
| 28 | 1 | 4.G.2.2 | 1 | 4.G.2.1 | 1 | 4.G.2.2 |
| 29 | 1 | 4.N.1.3 | 2 | 4.N.1.3 | 2 | 4.N.1.3 | 1 | 4.N.1.3 | 1 | 4.N.1.3 | 2 | 4.N.1.3 | 1 | 4.N.1.3 |
| 30 | 1 | 4.N.1.2 | 1 | 4.N.2.1 |
| 31 | 2 | 4.S.1.1 | 2 | 4.S.1.1 | 1 | 4.S.1.1 | 1 | 4.S.1.1 | 2 | 4.S.1.1 | 2 | 4.S.1.2 | 2 | 4.S.1.1 |
| 32 | 1 | 4.A.1.1 |
| 33 | 2 | 4.G.1.1 | 2 | 4.G.2.1 | 1 | 4.G.1.1 | 1 | 4.G.1.1 | 1 | 4.G.1.1 | 1 | 4.G.1.1 | 2 | 4.G.1.1 |
| 34 | 2 | 4.M.1.1 | 2 | 4.M.1.1 | 2 | 4.M.1.1 | 2 | 4.M.1.1 | 1 | 4.M.1.1 | 1 | 4.M.1.1 | 2 | 4.M.1.1 |
| 35 | 1 | 4.S.1.2 | 2 | 4.S.1.2 | 1 | 4.S.1.2 |
| 36 | 1 | 4.A.3.1 | 1 | 4.A.1.3 | 1 | 4.A.1.1 | 2 | 4.A.3.1 | 1 | 4.A.3.1 | 1 | 4.A.3.1 | 1 | 4.A.3.1 |
| 37 | 1 | 4.M.1.3 | 1 | 4.N.1.4 |
| 38 | 1 | 4.N.1 | 1 | 4.N.1 | 1 | 4.N.1 | 1 | 4.N.1 | 1 | 4.N.3 | 1 | 4.N.1 | 1 | 4.N.1 |

Table 4.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 4

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 39 | 2 | 4.S.2.1 | 2 | 4.S.2.1 | 1 | 4.S.2.1 | 1 | 4.S.2.1 | 2 | 4.S.2.1 | 1 | 4.S.2.1 | 2 | 4.S.2.1 |
| 40 | | | | | | | | | | | | | | |
| 41 | | | | | | | | | | | | | | |
| 42 | | | | | | | | | | | | | | |
| 43 | 2 | 4.G.2.1 | 1 | 4.G.2.1 |
| 44 | 1 | 4.A.1.2 |
| 45 | 2 | 4.A.2.1 |
| 46 | 2 | 4.N.3.1 | 2 | 4.N.3.1 | 2 | 4.N.3.1 | 1 | 4.N.3.1 | 1 | 4.N.3.1 | 1 | 4.N.3.1 | 2 | 4.N.3.1 |
| 47 | 2 | 4.A.4.1 | 2 | 4.A.4.1 | 2 | 4.M.1.2 | 2 | 4.M.1.2 | 1 | 4.A.4.1 | 2 | 4.A.4.1 | 2 | 4.A.4.1 |
| 48 | 2 | 4.A.4.1 | 1 | 4.N.3.1 | 2 | 4.N.2.2 |
| 49 | 1 | 4.A.2.1 | 1 | 4.A.2.1 | 1 | 4.A.2.1 | 2 | 4.A.2.1 | 1 | 4.A.2.1 | 1 | 4.N.3.1 | 1 | 4.A.2.1 |
| 50 | 2 | 4.N.3 | 2 | 4.N.2.1 | 2 | 4.A.3.1 | 2 | 4.A.3.1 | 2 | 4.N.2.1 | 2 | 4.N.2 | 2 | 4.N.2.1 |
| 51 | 2 | 4.S.2.1 | 2 | 4.S.2.1 | 2 | 4.S.2.1 | 1 | 4.S.2.1 | 2 | 4.S.2.1 | 1 | 4.S.2.1 | 2 | 4.S.2.1 |
| 52 | 2 | 4.N.2.1 | 1 | 4.N.2.1 |
| 53 | 1 | 4.G.1.1 |
| 54 | 2 | 4.S.2.1 | 1 | 4.S.2.1 | 2 | 4.S.2.1 |
| 55 | 1 | 4.N.1.1 | 1 | 4.A.2.1 | 1 | 4.N.1.1 | 1 | 4.N.1.1 | 1 | 4.N.1.1 | 1 | 4.A.2.1 | 1 | 4.A.2.1 |
| 56 | 2 | 4.N.3.1 | 1 | 4.N.3.1 | 2 | 4.N.3.1 |
| 57 | 2 | 4.G.2.1 |
| 58 | 1 | 4.A.4.1 | 1 | 4.A.4.1 | 1 | 4.A.4.1 | 1 | 4.A.4.1 | 1 | 4.A.3.1 | 1 | 4.N.2.1 | 2 | 4.A.4.1 |
| 59 | 1 | 4.M.1.2 |
| 60 | 1 | 4.G.1.2 | 1 | 4.G.1.1 | 1 | 4.G.1.2 |
| 61 | 1 | 4.A.1.1 |
| 62 | 1 | 4.G.1.1 |
| 63 | 2 | 4.A.3.1 | 2 | 4.A.3.1 | 1 | 4.A.3.1 | 1 | 4.A.3.1 | 1 | 4.A.3.1 | 1 | 4.A.3.1 | 2 | 4.A.3.1 |
| 64 | 1 | 4.S.1.2 |
| 65 | 1 | 4.A.2.2 | 2 | 4.A.2.2 | 2 | 4.A.2.2 | 2 | 4.A.2.2 | 2 | 4.A.1.1 | 2 | 4.A.1.1 | 2 | 4.A.2.2 |
| 66 | 1 | 4.N.3.1 | 1 | 4.N.3.1 | 2 | 4.N.3.1 | 1 | 4.N.3.1 | 1 | 4.N.3.1 | 1 | 4.N.3.1 | 2 | 4.N.3.1 |
| 67 | 1 | 4.M.1.2 | 1 | 4.N.2.2 | 1 | 4.M.1.2 | 1 | 4.N.2.2 | 1 | 4.N.2.2 | 1 | 4.N.2.2 | 1 | 4.N.2.2 |
| 68 | 1 | 4.M.1.4 | 1 | 4.M.1.4 | 1 | 4.M.1.4 | 1 | 4.M.1.4 | 1 | 4.M.1.1 | 1 | 4.M.1.4 | 1 | 4.M.1.4 |
| 69 | 1 | 4.A.3.1 | 2 | 4.A.3.1 | 1 | 4.A.3.1 | 1 | 4.A.3.1 | 1 | 4.A.3.1 | 1 | 4.A.3.1 | 2 | 4.A.3.1 |
| 70 | 1 | 4.G.1 | 1 | 4.G.1 | 1 | 4.G.1 | 1 | 4.G.1 | 2 | 4.G.1 | 1 | 4.G.1 | 1 | 4.G.1 |
| 71 | 2 | 4.A.4.1 |
| 72 | 1 | 4.N.2.1 |
| 73 | 1 | 4.A.1.3 | 2 | 4.A.3.1 | 2 | 4.A.3.1 | 2 | 4.A.3.1 | 1 | 4.A.3.1 | 1 | 4.A.3.1 | 2 | 4.A.3.1 |
| 74 | 1 | 4.M.1.1 |
| 75 | 2 | 4.A.3.1 | 2 | 4.A.2.2 | 1 | 4.A.3.1 | 2 | 4.A.3.1 | 1 | 4.A.3.1 | 1 | 4.A.3.1 | 2 | 4.A.3.1 |
| 76 | 1 | 4.G.2.2 |

Table 4.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 4

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 77 | 1 | 4.S.2.1 | 2 | 4.S.2.1 | 1 | 4.S.2.1 | 1 | 4.S.2.1 | 2 | 4.S.2.1 | 1 | 4.S.2.1 | 2 | 4.S.2.1 |
| 78 | 2 | 4.G.1.1 | 2 | 4.G.1.1 | 2 | 4.G.2.1 | 2 | 4.G.1.1 | 1 | 4.G.1.1 | 2 | 4.G.1 | 2 | 4.G.1.1 |
| 79 | 1 | 4.N.1.2 | 1 | 4.N.2.1 | 1 | 4.N.1.2 |
| 80 | 1 | 4.N.3.1 |
| 81 | | | | | | | | | | | | | | |
| 82 | | | | | | | | | | | | | | |
| 83 | 1 | 4.A.4.1 |
| 84 | 2 | 4.A.3.1 | 2 | 4.A.3.1 | 2 | 4.A.3.1 | 2 | 4.A.3.1 | 1 | 4.A.2.2 | 2 | 4.A.3.1 | 2 | 4.A.3.1 |
| 85 | 1 | 4.A.2.2 | 2 | 4.A.2.2 | 1 | 4.A.2.2 | 1 | 4.A.1.1 | 1 | 4.A.2.2 | 1 | 4.A.2.2 | 2 | 4.A.2.2 |
| 86 | 2 | 4.G.2.2 | 1 | 4.G.2.2 | 2 | 4.G.2.2 | 1 | 4.G.2.2 | 1 | 4.G.2.2 | 1 | 4.A.2.2 | 1 | 4.G.2.2 |
| 87 | 1 | 4.A.2.2 | 2 | 4.A.2.2 | 1 | 4.A.2.2 |
| 88 | 2 | 4.S.2.1 | 2 | 4.S.2.1 | 2 | 4.S.2.1 | 1 | 4.S.2.1 | 2 | 4.S.2.1 | 1 | 4.S.2.1 | 1 | 4.S.2.1 |
| 89 | 1 | 4.S.1 | 1 | 4.S.1 | 1 | 4.S.1 | 1 | 4.S.1 | 2 | 4.S.1 | 1 | 4.S.1 | 1 | 4.S.1 |
| 90 | 2 | 4.A.3.1 | 1 | 4.A.3.1 |
| 91 | 2 | 4.G.2.2 | 1 | 4.G.2.2 |
| 92 | 1 | 4.A.1.3 | 1 | 4.N.1.1 | 1 | 4.A.1.3 |

Objective Pairwise Comparison: 0.8736
Standard Pairwise Comparison: 0.949

Table 4.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 4

| Low | | Medium | | High | | | |
|------------|---------|----------|---------|---------|---------|---------|---------|
| 0 | | 6.391304 | | 7 | | | |
| 1 3427083 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 |
| 2 3529690 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 |
| 3 2177083 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 |
| 4 3328672 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 |
| 5 3541264 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.3 |
| 6 2177070 | 4.N.1.3 | 4.N.1.3 | 4.N.1.3 | 4.N.1.3 | 4.N.1.3 | 4.N.1.3 | 4.N.1.3 |
| 7 2177092 | 4.S.1.1 | 4.S.2.1 | 4.S.2.1 | 4.S.2.1 | 4.S.2.1 | 4.S.2.1 | 4.S.2.1 |
| 8 3328681 | 4.A.1.3 | 4.A.1.3 | 4.A.1.3 | 4.A.1.3 | 4.A.1.3 | 4.A.1.3 | 4.A.1.3 |
| 9 3531518 | 4.A.1.1 | 4.A.1.1 | 4.A.1.1 | 4.A.1.1 | 4.A.1.1 | 4.A.1.1 | 4.A.1.1 |
| 10 3328671 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 |
| 11 2177004 | 4.M.1.3 | 4.M.1.3 | 4.M.1.3 | 4.M.1.3 | 4.M.1.3 | 4.M.1.3 | 4.M.1.3 |
| 12 2177007 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.1 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 2177048 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 |
| 17 2177053 | 4.M.1.4 | 4.M.1.4 | 4.M.1.4 | 4.M.1.4 | 4.M.1.4 | 4.M.1.4 | 4.M.1.4 |
| 18 2177073 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 |
| 19 2105473 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 |
| 20 2105474 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 |
| 21 2177050 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 |
| 22 3530256 | 4.N.2.2 | 4.N.2.2 | 4.N.2.2 | 4.N.2.2 | 4.N.2.2 | 4.N.2.2 | 4.N.2.2 |
| 23 3344670 | 4.A.2.1 | 4.A.2.1 | 4.A.2.1 | 4.A.2.1 | 4.A.2.1 | 4.A.2.1 | 4.A.2.1 |
| 24 2177080 | 4.A.4.1 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 | 4.M.1.2 |
| 25 2177065 | 4.N.2.1 | 4.N.2.1 | 4.N.2.1 | 4.N.2.1 | 4.N.2.1 | 4.N.2.1 | 4.N.2.1 |
| 26 3532346 | 4.S.2.1 | 4.S.2.1 | 4.S.2.1 | 4.S.2.1 | 4.S.2.1 | 4.S.2.1 | 4.S.2.1 |
| 27 2177084 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.N.2.1 |
| 28 2345758 | 4.G.2.1 | 4.G.2.2 | 4.G.2.2 | 4.G.2.2 | 4.G.2.2 | 4.G.2.2 | 4.G.2.2 |
| 29 3530250 | 4.N.1.3 | 4.N.1.3 | 4.N.1.3 | 4.N.1.3 | 4.N.1.3 | 4.N.1.3 | 4.N.1.3 |
| 30 3530253 | 4.N.1.2 | 4.N.2.1 | 4.N.2.1 | 4.N.2.1 | 4.N.2.1 | 4.N.2.1 | 4.N.2.1 |
| 31 3532338 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.1 | 4.S.1.2 |
| 32 3531517 | 4.A.1.1 | 4.A.1.1 | 4.A.1.1 | 4.A.1.1 | 4.A.1.1 | 4.A.1.1 | 4.A.1.1 |
| 33 3531531 | 4.G.1.1 | 4.G.1.1 | 4.G.1.1 | 4.G.1.1 | 4.G.1.1 | 4.G.1.1 | 4.G.2.1 |
| 34 3531536 | 4.M.1.1 | 4.M.1.1 | 4.M.1.1 | 4.M.1.1 | 4.M.1.1 | 4.M.1.1 | 4.M.1.1 |
| 35 3532339 | 4.S.1.2 | 4.S.1.2 | 4.S.1.2 | 4.S.1.2 | 4.S.1.2 | 4.S.1.2 | 4.S.1.2 |
| 36 3351204 | 4.A.1.1 | 4.A.1.3 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 |
| 37 3530251 | 4.M.1.3 | 4.N.1.4 | 4.N.1.4 | 4.N.1.4 | 4.N.1.4 | 4.N.1.4 | 4.N.1.4 |
| 38 3530260 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.1 | 4.N.3 |

Table 4.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 4

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 39 3532341 | 4.S.2.1 |
| 40 | | | | | | | |
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 2177040 | 4.G.2.1 |
| 44 3328669 | 4.A.1.2 |
| 45 3531523 | 4.A.2.1 |
| 46 3351152 | 4.N.3.1 |
| 47 2177074 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.M.1.2 | 4.M.1.2 |
| 48 3530261 | 4.A.4.1 | 4.N.2.2 | 4.N.3.1 | 4.N.3.1 | 4.N.3.1 | 4.N.3.1 | 4.N.3.1 |
| 49 3531522 | 4.A.2.1 | 4.A.2.1 | 4.A.2.1 | 4.A.2.1 | 4.A.2.1 | 4.A.2.1 | 4.N.3.1 |
| 50 2177023 | 4.A.3.1 | 4.A.3.1 | 4.N.2 | 4.N.2.1 | 4.N.2.1 | 4.N.2.1 | 4.N.3 |
| 51 3532345 | 4.S.2.1 |
| 52 3530252 | 4.N.2.1 |
| 53 3345354 | 4.G.1.1 |
| 54 3532342 | 4.S.2.1 |
| 55 3531521 | 4.A.2.1 | 4.A.2.1 | 4.A.2.1 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 | 4.N.1.1 |
| 56 3345358 | 4.N.3.1 |
| 57 3536202 | 4.G.2.1 |
| 58 2345754 | 4.A.3.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.A.4.1 | 4.N.2.1 |
| 59 2177075 | 4.M.1.2 |
| 60 2177038 | 4.G.1.1 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 | 4.G.1.2 |
| 61 3531528 | 4.A.1.1 |
| 62 3536071 | 4.G.1.1 |
| 63 2177013 | 4.A.3.1 |
| 64 2177087 | 4.S.1.2 |
| 65 3531526 | 4.A.1.1 | 4.A.1.1 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 |
| 66 3530258 | 4.N.3.1 |
| 67 2177066 | 4.M.1.2 | 4.M.1.2 | 4.N.2.2 | 4.N.2.2 | 4.N.2.2 | 4.N.2.2 | 4.N.2.2 |
| 68 3536523 | 4.M.1.1 | 4.M.1.4 | 4.M.1.4 | 4.M.1.4 | 4.M.1.4 | 4.M.1.4 | 4.M.1.4 |
| 69 2177016 | 4.A.3.1 |
| 70 3536484 | 4.G.1 |
| 71 3531529 | 4.A.4.1 |
| 72 2345755 | 4.N.2.1 |
| 73 2177021 | 4.A.1.3 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 |
| 74 3531537 | 4.M.1.1 |
| 75 2177014 | 4.A.2.2 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 |
| 76 2177001 | 4.G.2.2 |
| 77 3532344 | 4.S.2.1 |
| 78 2345761 | 4.G.1 | 4.G.1.1 | 4.G.1.1 | 4.G.1.1 | 4.G.1.1 | 4.G.1.1 | 4.G.2.1 |
| 79 3536075 | 4.N.1.2 | 4.N.1.2 | 4.N.1.2 | 4.N.1.2 | 4.N.1.2 | 4.N.1.2 | 4.N.2.1 |
| 80 3530259 | 4.N.3.1 |

Table 4.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 4

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 3531530 | 4.A.4.1 |
| 84 2177027 | 4.A.2.2 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 | 4.A.3.1 |
| 85 2177028 | 4.A.1.1 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 | 4.A.2.2 |
| 86 3531534 | 4.A.2.2 | 4.G.2.2 | 4.G.2.2 | 4.G.2.2 | 4.G.2.2 | 4.G.2.2 | 4.G.2.2 |
| 87 3427084 | 4.A.2.2 |
| 88 3532343 | 4.S.2.1 |
| 89 2177089 | 4.S.1 |
| 90 3531516 | 4.A.3.1 |
| 91 3531535 | 4.G.2.2 |
| 92 3536065 | 4.A.1.3 | 4.A.1.3 | 4.A.1.3 | 4.A.1.3 | 4.A.1.3 | 4.A.1.3 | 4.N.1.1 |

Table 4.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 4

| Low | | Medium | | High |
|-----|--|----------|--|------|
| 0 | | 13.67442 | | 48 |

| | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.A | | | | | | | | | | | | | | | | | | | | |
| 4.A.1 | | | | | | | | | | | | | | | | | | | | |
| 4.A.1.1 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 6 | 6 | 6 | 6 | |
| | | | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 1 | 1 | 1 | 1 | 1 |
| | 6 | 6 | 6 | 6 | 8 | | | | | | | | | | | | | | | |
| | 1 | 1 | 5 | 5 | 5 | | | | | | | | | | | | | | | |
| 4.A.1.2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | | | | |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | | | | |
| 4.A.1.3 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 3 | 7 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | | |
| | | | | | | | | 6 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | |
| 4.A.2 | | | | | | | | | | | | | | | | | | | | |
| 4.A.2.1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 9 | 9 | 9 | 9 | 9 |
| | 5 | 5 | 5 | | | | | | | | | | | | | | | | | |
| | 5 | 5 | 5 | | | | | | | | | | | | | | | | | |
| 4.A.2.2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 6 | 6 | 6 | 6 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | |
| | | | | | | | | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | |
| | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | |
| 4.A.3 | | | | | | | | | | | | | | | | | | | | |
| 4.A.3.1 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | 6 | 6 | 6 | 6 | 6 | 0 | 0 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 9 | 9 | 9 | 9 | 9 |
| | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | |
| | 9 | 9 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | |
| | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | | | | | | | | | | |
| | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| 4.A.4 | | | | | | | | | | | | | | | | | | | | |
| 4.A.4.1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | |
| | | | | | | | | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 |
| | 5 | 5 | 5 | 5 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | |
| | 8 | 8 | 8 | 8 | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 4.G | | | | | | | | | | | | | | | | | | | | |
| 4.G.1 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | | | | | | | | | | | | |
| 4.G.1.1 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 2 | 2 | 2 | 2 | 2 |
| | 6 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | | | |
| | 2 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | | |

Table 4.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 4

| | | | | | | | | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.G.1. 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 6 | 6 | 6 | 6 | 6 |
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4.G.2 | | | | | | | | | | | | | | | | | | | | |
| 4.G.2. 1 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | | | |
| | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | | | |
| 4.G.2. 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 9 |
| | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 1 |
| | 9 | 9 | 9 | 9 | 9 | 9 | | | | | | | | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | |
| 4.M | | | | | | | | | | | | | | | | | | | | |
| 4.M.1 | | | | | | | | | | | | | | | | | | | | |
| 4.M.1. 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 8 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | |
| 4.M.1. 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | | | | | | | | | |
| | 7 | 7 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 7 | 7 | | | | | | | | | |
| 4.M.1. 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | | | | | | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | | | | | | | | | | | | |
| 4.M.1. 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | |
| 4.N | | | | | | | | | | | | | | | | | | | | |
| 4.N.1 | 5 | 5 | 5 | 5 | 5 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | | | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 4.N.1. 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 5 | 5 | 5 | 9 | |
| | | | | | | | | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 5 | 5 | 5 | 5 | 2 | |
| 4.N.1. 2 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | | |
| | 0 | 9 | 9 | 9 | 9 | 9 | 9 | | | | | | | | | | | | | |
| 4.N.1. 3 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | |
| | | | | | | | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | | | |
| 4.N.1. 4 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | | | | |
| | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | | | |
| 4.N.2 | 5 | | | | | | | | | | | | | | | | | | | |
| | 0 | | | | | | | | | | | | | | | | | | | |
| 4.N.2. 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| | 5 | 5 | 5 | 5 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | |
| | 2 | 2 | 2 | 2 | 8 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 9 | | | | | | |
| 4.N.2. 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 6 | 6 | 6 | 6 | 6 | | | | | | | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 8 | 7 | 7 | 7 | 7 | 7 | | | | | | | |
| 4.N.3 | 5 | 3 | 5 | | | | | | | | | | | | | | | | | |
| | | 8 | 0 | | | | | | | | | | | | | | | | | |

Table 4.10
Items Coded by Reviewers to Each Objective
South Dakota Mathematics 2008 Grade 4

| | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.N.3.1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| 4.S | | | | | | | | | | | | | | | | | | | | |
| 4.S.1 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | | | | | | | | | | | |
| 4.S.1.1 | 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| | 3 | | | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | | | |
| 4.S.1.2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | |
| | 1 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | |
| 4.S.2 | | | | | | | | | | | | | | | | | | | | |
| 4.S.2.1 | 7 | 7 | 7 | 7 | 7 | 7 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | | | | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | |
| | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | |

Table 4.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 4

| Low | | Medium | | High | | | | | |
|---------|------|--------|------|------|------|------|------|------|------|
| 1 | | 3 | | 7 | | | | | |
| 4.A | | | | | | | | | |
| 4.A.1 | | | | | | | | | |
| 4.A.1.1 | 9:7 | 32:7 | 36:1 | 61:7 | 65:2 | 85:1 | | | |
| 4.A.1.2 | 44:7 | | | | | | | | |
| 4.A.1.3 | 8:7 | 36:1 | 73:1 | 92:6 | | | | | |
| 4.A.2 | | | | | | | | | |
| 4.A.2.1 | 23:7 | 45:7 | 49:6 | 55:3 | | | | | |
| 4.A.2.2 | 1:7 | 65:5 | 75:1 | 84:1 | 85:6 | 86:1 | 87:7 | | |
| 4.A.3 | | | | | | | | | |
| 4.A.3.1 | 36:5 | 50:2 | 58:1 | 63:7 | 69:7 | 73:6 | 75:6 | 84:6 | 90:7 |
| 4.A.4 | | | | | | | | | |
| 4.A.4.1 | 3:7 | 24:1 | 27:6 | 47:5 | 48:1 | 58:5 | 71:7 | 83:7 | |
| 4.G | | | | | | | | | |
| 4.G.1 | 70:7 | 78:1 | | | | | | | |
| 4.G.1.1 | 33:6 | 53:7 | 60:1 | 62:7 | 78:5 | | | | |
| 4.G.1.2 | 4:7 | 10:7 | 60:6 | | | | | | |
| 4.G.2 | | | | | | | | | |
| 4.G.2.1 | 28:1 | 33:1 | 43:7 | 57:7 | 78:1 | | | | |
| 4.G.2.2 | 28:6 | 76:7 | 86:6 | 91:7 | | | | | |
| 4.M | | | | | | | | | |
| 4.M.1 | | | | | | | | | |
| 4.M.1.1 | 34:7 | 68:1 | 74:7 | | | | | | |
| 4.M.1.2 | 16:7 | 21:7 | 24:6 | 47:2 | 59:7 | 67:2 | | | |
| 4.M.1.3 | 11:7 | 37:1 | | | | | | | |
| 4.M.1.4 | 17:7 | 68:6 | | | | | | | |
| 4.N | | | | | | | | | |
| 4.N.1 | 5:6 | 12:7 | 38:6 | | | | | | |
| 4.N.1.1 | 2:7 | 18:7 | 55:4 | 92:1 | | | | | |
| 4.N.1.2 | 30:1 | 79:6 | | | | | | | |
| 4.N.1.3 | 6:7 | 29:7 | | | | | | | |
| 4.N.1.4 | 37:6 | | | | | | | | |
| 4.N.2 | 50:1 | | | | | | | | |
| 4.N.2.1 | 25:7 | 27:1 | 30:6 | 50:3 | 52:7 | 58:1 | 72:7 | 79:1 | |
| 4.N.2.2 | 22:7 | 48:1 | 67:5 | | | | | | |
| 4.N.3 | 5:1 | 38:1 | 50:1 | | | | | | |
| 4.N.3.1 | 46:7 | 48:5 | 49:1 | 56:7 | 66:7 | 80:7 | | | |
| 4.S | | | | | | | | | |
| 4.S.1 | 89:7 | | | | | | | | |

Table 4.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
South Dakota Mathematics 2008 Grade 4

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| 4.S.1.1 | 7:1 | 19:7 | 20:7 | 31:6 | | | |
| 4.S.1.2 | 31:1 | 35:7 | 64:7 | | | | |
| 4.S.2 | | | | | | | |
| 4.S.2.1 | 7:6 | 26:7 | 39:7 | 51:7 | 54:7 | 77:7 | 88:7 |

Table 4.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 4

| Low | | Medium | | High |
|-----|--|--------|--|------|
| 1 | | 3 | | 7 |

| | | | |
|------------|-----------|-----------|-----------|
| 1 3427083 | 4.A.2.2:7 | | |
| 2 3529690 | 4.N.1.1:7 | | |
| 3 2177083 | 4.A.4.1:7 | | |
| 4 3328672 | 4.G.1.2:7 | | |
| 5 3541264 | 4.N.1:6 | 4.N.3:1 | |
| 6 2177070 | 4.N.1.3:7 | | |
| 7 2177092 | 4.S.1.1:1 | 4.S.2.1:6 | |
| 8 3328681 | 4.A.1.3:7 | | |
| 9 3531518 | 4.A.1.1:7 | | |
| 10 3328671 | 4.G.1.2:7 | | |
| 11 2177004 | 4.M.1.3:7 | | |
| 12 2177007 | 4.N.1:7 | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 2177048 | 4.M.1.2:7 | | |
| 17 2177053 | 4.M.1.4:7 | | |
| 18 2177073 | 4.N.1.1:7 | | |
| 19 2105473 | 4.S.1.1:7 | | |
| 20 2105474 | 4.S.1.1:7 | | |
| 21 2177050 | 4.M.1.2:7 | | |
| 22 3530256 | 4.N.2.2:7 | | |
| 23 3344670 | 4.A.2.1:7 | | |
| 24 2177080 | 4.A.4.1:1 | 4.M.1.2:6 | |
| 25 2177065 | 4.N.2.1:7 | | |
| 26 3532346 | 4.S.2.1:7 | | |
| 27 2177084 | 4.A.4.1:6 | 4.N.2.1:1 | |
| 28 2345758 | 4.G.2.1:1 | 4.G.2.2:6 | |
| 29 3530250 | 4.N.1.3:7 | | |
| 30 3530253 | 4.N.1.2:1 | 4.N.2.1:6 | |
| 31 3532338 | 4.S.1.1:6 | 4.S.1.2:1 | |
| 32 3531517 | 4.A.1.1:7 | | |
| 33 3531531 | 4.G.1.1:6 | 4.G.2.1:1 | |
| 34 3531536 | 4.M.1.1:7 | | |
| 35 3532339 | 4.S.1.2:7 | | |
| 36 3351204 | 4.A.1.1:1 | 4.A.1.3:1 | 4.A.3.1:5 |
| 37 3530251 | 4.M.1.3:1 | 4.N.1.4:6 | |
| 38 3530260 | 4.N.1:6 | 4.N.3:1 | |

Table 4.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 4

| | | | | |
|------------|-----------|-----------|-----------|---------|
| 39 3532341 | 4.S.2.1:7 | | | |
| 40 | | | | |
| 41 | | | | |
| 42 | | | | |
| 43 2177040 | 4.G.2.1:7 | | | |
| 44 3328669 | 4.A.1.2:7 | | | |
| 45 3531523 | 4.A.2.1:7 | | | |
| 46 3351152 | 4.N.3.1:7 | | | |
| 47 2177074 | 4.A.4.1:5 | 4.M.1.2:2 | | |
| 48 3530261 | 4.A.4.1:1 | 4.N.2.2:1 | 4.N.3.1:5 | |
| 49 3531522 | 4.A.2.1:6 | 4.N.3.1:1 | | |
| 50 2177023 | 4.A.3.1:2 | 4.N.2:1 | 4.N.2.1:3 | 4.N.3:1 |
| 51 3532345 | 4.S.2.1:7 | | | |
| 52 3530252 | 4.N.2.1:7 | | | |
| 53 3345354 | 4.G.1.1:7 | | | |
| 54 3532342 | 4.S.2.1:7 | | | |
| 55 3531521 | 4.A.2.1:3 | 4.N.1.1:4 | | |
| 56 3345358 | 4.N.3.1:7 | | | |
| 57 3536202 | 4.G.2.1:7 | | | |
| 58 2345754 | 4.A.3.1:1 | 4.A.4.1:5 | 4.N.2.1:1 | |
| 59 2177075 | 4.M.1.2:7 | | | |
| 60 2177038 | 4.G.1.1:1 | 4.G.1.2:6 | | |
| 61 3531528 | 4.A.1.1:7 | | | |
| 62 3536071 | 4.G.1.1:7 | | | |
| 63 2177013 | 4.A.3.1:7 | | | |
| 64 2177087 | 4.S.1.2:7 | | | |
| 65 3531526 | 4.A.1.1:2 | 4.A.2.2:5 | | |
| 66 3530258 | 4.N.3.1:7 | | | |
| 67 2177066 | 4.M.1.2:2 | 4.N.2.2:5 | | |
| 68 3536523 | 4.M.1.1:1 | 4.M.1.4:6 | | |
| 69 2177016 | 4.A.3.1:7 | | | |
| 70 3536484 | 4.G.1:7 | | | |
| 71 3531529 | 4.A.4.1:7 | | | |
| 72 2345755 | 4.N.2.1:7 | | | |
| 73 2177021 | 4.A.1.3:1 | 4.A.3.1:6 | | |
| 74 3531537 | 4.M.1.1:7 | | | |
| 75 2177014 | 4.A.2.2:1 | 4.A.3.1:6 | | |
| 76 2177001 | 4.G.2.2:7 | | | |
| 77 3532344 | 4.S.2.1:7 | | | |
| 78 2345761 | 4.G.1:1 | 4.G.1.1:5 | 4.G.2.1:1 | |
| 79 3536075 | 4.N.1.2:6 | 4.N.2.1:1 | | |
| 80 3530259 | 4.N.3.1:7 | | | |

Table 4.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
South Dakota Mathematics 2008 Grade 4

| | | |
|------------|-----------|-----------|
| 81 | | |
| 82 | | |
| 83 3531530 | 4.A.4.1:7 | |
| 84 2177027 | 4.A.2.2:1 | 4.A.3.1:6 |
| 85 2177028 | 4.A.1.1:1 | 4.A.2.2:6 |
| 86 3531534 | 4.A.2.2:1 | 4.G.2.2:6 |
| 87 3427084 | 4.A.2.2:7 | |
| 88 3532343 | 4.S.2.1:7 | |
| 89 2177089 | 4.S.1:7 | |
| 90 3531516 | 4.A.3.1:7 | |
| 91 3531535 | 4.G.2.2:7 | |
| 92 3536065 | 4.A.1.3:6 | 4.N.1.1:1 |

Table 4.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 4

| Low DOK | | Matched DOK | | High DOK |
|---------|--|-------------|--|----------|
| 1 | | 3 | | 7 |

| | | | | | | | | | |
|---------------------|------------------|---------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|--------------------|
| 4.A [1]: | | | | | | | | | |
| 4.A. 1 [1]: | | | | | | | | | |
| 4.A. 1.1 [1]: | 9:7 1.29] | 32:7 [1] | 36:1 [1] | 61:7 [1] | 65:2 [2] | 85:1 [1] | | | |
| 4.A. 1.2 [1]: | 44:7 [1] | | | | | | | | |
| 4.A. 1.3 [1]: | 8:7 [1] | 36:1 [1] | 73:1 [1] | 92:6 [1] | | | | | |
| 4.A. 2 [1]: | | | | | | | | | |
| 4.A. 2.1 [1]: | 23:7 [1] | 45:7 [2] | 49:6 [1.1 7] | 55:3 [1] | | | | | |
| 4.A. 2.2 [1]: | 1:7 [1] | 65:5 [1.8] | 75:1 [2] | 84:1 [1] | 85:6 [1.3 3] | 86:1 [1] | 87:7 [1.1 4] | | |
| 4.A. 3 [2]: | | | | | | | | | |
| 4.A. 3.1 [2]: | 36:5 [1.2] | 50:2 [2] | 58:1 [1] | 63:7 [1.4 3] | 69:7 [1.2 9] | 73:6 [1.6 7] | 75:6 [1.5] | 84:6 [2] | 90:7 [1.1 4] |
| 4.A. 4 [2]: | | | | | | | | | |
| 4.A. 4.1 [2]: | 3:7 [2] | 24:1 [2] | 27:6 [1.5] | 47:5 [1.8] | 48:1 [2] | 58:5 [1.2] | 71:7 [2] | 83:7 [1] | |
| 4.G [1]: | | | | | | | | | |
| 4.G. | 70:7 | 78:1 | | | | | | | |

Table 4.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 4

| | | | | | | |
|---------------------|--------------------|--------------------|--------------------|--------------------|---------------|-------------|
| 1 [1]: | [1.1 4] | [2] | | | | |
| 4.G. 1.1 [1]: | 33:6 [1.3 3] | 53:7 [1] | 60:1 [1] | 62:7 [1] | 78:5 [1.8] | |
| 4.G. 1.2 [1]: | 4:7[1] | 10:7 [1] | 60:6 [1] | | | |
| 4.G. 2 [2]: | | | | | | |
| 4.G. 2.1 [2]: | 28:1 [1] | 33:1 [2] | 43:7 [1.1 4] | 57:7 [2] | 78:1 [2] | |
| 4.G. 2.2 [1]: | 28:6 [1] | 76:7 [1] | 86:6 [1.3 3] | 91:7 [1.1 4] | | |
| 4.M [2]: | | | | | | |
| 4.M. 1 [2]: | | | | | | |
| 4.M. 1.1 [1]: | 34:7 [1.7 1] | 68:1 [1] | 74:7 [1] | | | |
| 4.M. 1.2 [2]: | 16:7 [1.2 9] | 21:7 [1.7 1] | 24:6 [1.8 3] | 47:2 [2] | 59:7 [1] | 67:2 [1] |
| 4.M. 1.3 [2]: | 11:7 [1.2 9] | 37:1 [1] | | | | |
| 4.M. 1.4 [1]: | 17:7 [1] | 68:6 [1] | | | | |
| 4.N [1]: | | | | | | |
| 4.N. 1 [1]: | 5:6[1] | 12:7 [1] | 38:6 [1] | | | |
| 4.N. 1.1 [1]: | 2:7[1] | 18:7 [1] | 55:4 [1] | 92:1 [1] | | |
| 4.N. | 30:1 | 79:6 | | | | |

Table 4.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 4

| | | | | | | | | |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|
| 1.2 [1]: | [1] | [1] | | | | | | |
| 4.N. 1.3 [2]: | 6:7 1.71] | 29:7 [1.4 3] | | | | | | |
| 4.N. 1.4 [1]: | 37:6 [1] | | | | | | | |
| 4.N. 2 [1]: | 50:1 [2] | | | | | | | |
| 4.N. 2.1 [1]: | 25:7 [1] | 27:1 [2] | 30:6 [1] | 50:3 [2] | 52:7 [1.1 4] | 58:1 [1] | 72:7 [1] | 79:1 [1] |
| 4.N. 2.2 [1]: | 22:7 [1] | 48:1 [2] | 67:5 [1] | | | | | |
| 4.N. 3 [2]: | 5:1 [1] | 38:1 [1] | 50:1 [2] | | | | | |
| 4.N. 3.1 [2]: | 46:7 [1.5 7] | 48:5 [1] | 49:1 [1] | 56:7 [1.8 6] | 66:7 [1.2 9] | 80:7 [1] | | |
| 4.S [2]: | | | | | | | | |
| 4.S. 1 [3]: | 89:7 [1.1 4] | | | | | | | |
| 4.S. 1.1 [3]: | 7:1 [2] | 19:7 [1.8 6] | 20:7 [1.7 1] | 31:6 [1.6 7] | | | | |
| 4.S. 1.2 [1]: | 31:1 [2] | 35:7 [1.1 4] | 64:7 [1] | | | | | |
| 4.S. 2 [2]: | | | | | | | | |
| 4.S. 2.1 [2]: | 7:6 [1] | 26:7 [1.1 4] | 39:7 [1.5 7] | 51:7 [1.7 1] | 54:7 [1.2 9] | 77:7 [1.4 3] | 88:7 [1.5 7] | |

Table 5.1
Categorical Concurrence Between Standards and Assessment as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 5
Number of Assessment Items - 84

| Standards | | | Level by Objective | | | Hits | | Cat. Concurr. |
|-------------------------------------|------------|-----------|--------------------|-----------------------|------------------------|-------|------|------------------|
| Title | Goals # | Objs # | Level | # of objs by Level | % w/in std by Level | Mean | S.D. | |
| 5.A - ALGEBRA | 4 | 6.86 | 1 2 | 2 4 | 33 66 | 24.14 | 0.64 | YES |
| 5.G - GEOMETRY | 2 | 5 | 1 | 5 | 100 | 14 | 0 | YES |
| 5.M - MEASUREMENT | 1 | 4 | 1 2 | 3 1 | 75 25 | 12.86 | 0.83 | YES |
| 5.N - NUMBER SENSE | 3 | 11 | 1 2 | 7 2 | 77 22 | 20.71 | 1.16 | YES |
| 5.S - STATISTICS AND PROBABILITY | 2 | 5 | 1 2 4 | 1 2 1 | 25 50 25 | 12.29 | 0.88 | YES |
| Total | 12 | 31.86 | 1 2 4 | 18 9 1 | 64 32 3 | 84 | 0 | |

Table 5.2a

Alternate Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Seven Reviewers (Does Not Assume Each Objective Should Have Equal Representation)

South Dakota Mathematics 2008 Grade 5

Number of Assessment Items - 84

| Standards | | | Hits | | Level of Item w.r.t. Standard | | | | | | DOK Consistency |
|----------------------------------|---------|--------|-------|------|-------------------------------|------|------|------|---------|------|-----------------|
| | | | | | % Under | | % At | | % Above | | |
| Title | Goals # | Objs # | M | S.D. | M | S.D. | M | S.D. | M | S.D. | |
| 5.A - ALGEBRA | 4 | 6.86 | 24.14 | 0.64 | 24 | 130 | 67 | 33 | 9 | 33 | YES |
| 5.G - GEOMETRY | 2 | 5 | 14 | 0 | 0 | 0 | 76 | 28 | 24 | 28 | YES |
| 5.M - MEASUREMENT | 1 | 4 | 12.86 | 0.83 | 40 | 248 | 37 | 35 | 23 | 44 | YES |
| 5.N - NUMBER SENSE | 3 | 11 | 20.71 | 1.16 | 3 | 32 | 83 | 27 | 15 | 27 | YES |
| 5.S - STATISTICS AND PROBABILITY | 2 | 5 | 12.29 | 0.88 | 57 | 244 | 37 | 48 | 6 | 22 | WEAK |
| Total | 12 | 31.86 | 84 | 0 | 14 | 30 | 66 | 38 | 20 | 33 | |

Table 5.3

Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Seven Reviewers

South Dakota Mathematics 2008 Grade 5

Number of Assessment Items - 84

| Standards | | | Hits | | Range of Objectives | | | | Rng. of Know. | Balance Index | | | | Bal. of Represent. |
|----------------------------------|---------|--------|-------|------|---------------------|------|------------|------|---------------|------------------------|------|-------|------|--------------------|
| | | | | | # Objs Hit | | % of Total | | | % Hits in Std/Ttl Hits | | Index | | |
| Title | Goals # | Objs # | Mean | S.D. | Mean | S.D. | Mean | S.D. | | Mean | S.D. | Mean | S.D. | |
| 5.A - ALGEBRA | 4 | 6.86 | 24.14 | 0.64 | 6.86 | 0.35 | 100 | 0 | YES | 29 | 1 | 0.79 | 0.03 | YES |
| 5.G - GEOMETRY | 2 | 5 | 14 | 0 | 4 | 0 | 80 | 0 | YES | 17 | 0 | 0.93 | 0 | YES |
| 5.M - MEASUREMENT | 1 | 4 | 12.86 | 0.83 | 4 | 0 | 100 | 0 | YES | 15 | 1 | 0.65 | 0.01 | WEAK |
| 5.N - NUMBER SENSE | 3 | 11 | 20.71 | 1.16 | 8.14 | 0.35 | 74 | 3 | YES | 25 | 1 | 0.74 | 0.03 | YES |
| 5.S - STATISTICS AND PROBABILITY | 2 | 5 | 12.29 | 0.88 | 5 | 0.53 | 100 | 0 | YES | 15 | 1 | 0.67 | 0.04 | WEAK |
| Total | 12 | 31.86 | 84 | 0 | 5.6 | 1.68 | 91 | 12 | | 20 | 6 | 0.76 | 0.10 | |

Table 5.4

Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 5
Number of Assessment Items - 84

| Standards | Alignment Criteria | | | |
|----------------------------------|-------------------------|--------------------------------|--------------------|---------------------------|
| | Categorical Concurrence | Depth-of-Knowledge Consistency | Range of Knowledge | Balance of Representation |
| 5.A - ALGEBRA | YES | YES | YES | YES |
| 5.G - GEOMETRY | YES | YES | YES | YES |
| 5.M - MEASUREMENT | YES | YES | YES | WEAK |
| 5.N - NUMBER SENSE | YES | YES | YES | YES |
| 5.S - STATISTICS AND PROBABILITY | YES | WEAK | YES | WEAK |

Table 5.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 5

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 8 | 2 | 1 | 2 | 2 | 1 | 2 | 1 |
| 9 | 2 | 1 | 1 | 1 | 2 | 1 | 1 |
| 10 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 11 | 2 | 1 | 1 | 2 | 1 | 2 | 1 |
| 12 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 17 | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| 18 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| 19 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 20 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| 21 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 22 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 23 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 24 | 2 | 2 | 2 | 2 | 1 | 1 | 2 |
| 25 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 26 | 1 | 2 | 1 | 2 | 2 | 2 | 2 |
| 27 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| 28 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 29 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 30 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 31 | 2 | 1 | 1 | 1 | 2 | 2 | 1 |
| 32 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 33 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 34 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 35 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 36 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 37 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 38 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 39 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 40 | | | | | | | |

Table 5.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 5

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| 44 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| 45 | 2 | 2 | 3 | 2 | 2 | 2 | 2 |
| 46 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 47 | 1 | 2 | 1 | 1 | 1 | 2 | 1 |
| 48 | 1 | 1 | 2 | 2 | 1 | 2 | 1 |
| 49 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 50 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 51 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 52 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 53 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 54 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| 55 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 56 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 57 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 58 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| 59 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 60 | 2 | 2 | 1 | 2 | 2 | 1 | 1 |
| 61 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 62 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 63 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 64 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 65 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 66 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 67 | 2 | 2 | 2 | 2 | 1 | 1 | 2 |
| 68 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 69 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 70 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 71 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 72 | 1 | 2 | 1 | 2 | 1 | 2 | 1 |
| 73 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 74 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 75 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 76 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 77 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 78 | 2 | 1 | 1 | 2 | 1 | 1 | 1 |
| 79 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 80 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |

Table 5.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 5

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 | 2 | 2 | 1 | 2 | 2 | 1 | 1 |
| 84 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 85 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 86 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| 87 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 88 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 89 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 90 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 91 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 92 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |

Intraclass Correlation: 0.9323

Pairwise Comparison: 0.8107

Table 5.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 5

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 1 | 1 | 5.N.2 | 1 | 5.N.2 | 1 | 5.N.2 | 1 | 5.N.2 | 1 | 5.N.1 | 1 | 5.N.2 | 1 | 5.N.1 |
| 2 | 2 | 5.A.3.2 | 1 | 5.A.3.2 | 2 | 5.A.3.2 |
| 3 | 1 | 5.G.1.1 |
| 4 | 2 | 5.N.3.1 |
| 5 | 2 | 5.A.2.1 |
| 6 | 1 | 5.S.2.1 |
| 7 | 2 | 5.G.2.3 |
| 8 | 2 | 5.M.1.2 | 1 | 5.M.1.2 | 2 | 5.M.1.2 | 2 | 5.M.1.2 | 1 | 5.M.1.2 | 2 | 5.M.1.2 | 1 | 5.M.1.2 |
| 9 | 2 | 5.G.2.1 | 1 | 5.G.2.1 | 1 | 5.G.2.1 | 1 | 5.G.2.1 | 2 | 5.G.2.1 | 1 | 5.G.2.1 | 1 | 5.G.2.1 |
| 10 | 2 | 5.N.1.1 |
| 11 | 2 | 5.N.1.4 | 1 | 5.N.1.4 | 1 | 5.N.1.4 | 2 | 5.N.1.4 | 1 | 5.N.1.4 | 2 | 5.N.1.4 | 1 | 5.N.1.4 |
| 12 | 1 | 5.N.2.2 |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | 2 | 5.A.2.1 | 2 | 5.N.2.1 | 2 | 5.A.2.1 | 2 | 5.A.2.1 | 2 | 5.A.1.1 | 2 | 5.A.2.1 | 2 | 5.A.2.1 |
| 17 | 1 | 5.M.1.4 | 1 | 5.M.1.4 | 1 | 5.M.1.4 | 2 | 5.M.1.4 | 1 | 5.M.1.4 | 2 | 5.M.1.4 | 1 | 5.M.1.4 |
| 18 | 3 | 5.N.3.1 | 2 | 5.N.3.1 | 3 | 5.N.3.1 |
| 19 | 2 | 5.M.1.1 |
| 20 | 2 | 5.M.1.2 | 2 | 5.M.1.2 | 2 | 5.M.1.2 | 2 | 5.M.1.2 | 1 | 5.M.1.2 | 2 | 5.M.1.2 | 2 | 5.M.1.2 |
| 21 | 1 | 5.N.2.2 |
| 22 | 2 | 5.S.1.1 |
| 23 | 1 | 5.M.1.2 | 1 | 5.M.1.2 | 1 | 5.M.1.2 | 2 | 5.M.1.2 | 1 | 5.M.1.2 | 1 | 5.M.1.2 | 1 | 5.M.1.2 |
| 24 | 2 | 5.A.2.1 | 2 | 5.A.3.1 | 2 | 5.A.3.1 | 2 | 5.A.3.1 | 1 | 5.A.3.1 | 1 | 5.A.3.1 | 2 | 5.A.3.1 |
| 25 | 1 | 5.N.1.1 | 1 | 5.N.1.1 | 1 | 5.N.1.1 | 2 | 5.N.1.1 | 1 | 5.N.1.1 | 1 | 5.N.1.1 | 1 | 5.N.1.1 |
| 26 | 1 | 5.S.1.1 | 2 | 5.S.1.1 | 1 | 5.S.1.1 | 2 | 5.S.1.1 | 2 | 5.S.1.1 | 2 | 5.S.1.1 | 2 | 5.S.1.1 |
| 27 | 1 | 5.A.4.1 | 1 | 5.A.4.1 | 1 | 5.A.4.1 | 2 | 5.A.4.1 | 2 | 5.A.4.1 | 2 | 5.A.4.1 | 2 | 5.A.4.1 |
| 28 | 1 | 5.S.1.1 | 1 | 5.S.1.1 | 1 | 5.S.1.1 | 2 | 5.S.1 | 1 | 5.S.1.1 | 1 | 5.N.1.1 | 1 | 5.S.1.1 |
| 29 | 2 | 5.N.1.3 |
| 30 | 1 | 5.N.1 |
| 31 | 2 | 5.A.1.1 | 1 | 5.A.1.1 | 1 | 5.A.1.1 | 1 | 5.A.1.1 | 2 | 5.A.1.1 | 2 | 5.A.1.2 | 1 | 5.A.1.1 |
| 32 | 1 | 5.G.1.2 |
| 33 | 2 | 5.A.3.1 | 2 | 5.A.4.1 | 2 | 5.A.4.1 | 2 | 5.A.3.1 | 2 | 5.A.4.1 | 2 | 5.A.4.1 | 2 | 5.A.4.1 |
| 34 | 2 | 5.N.1.4 | 1 | 5.N.1.4 |
| 35 | 1 | 5.G.2.3 |
| 36 | 1 | 5.A.2.1 |
| 37 | 1 | 5.S.2 | 2 | 5.S.2 | 1 | 5.S.2 | 1 | 5.S.2 | 1 | 5.S.2.2 | 1 | 5.S.2 | 1 | 5.S.2 |
| 38 | 1 | 5.M.1.2 | 1 | 5.M.1.2 | 1 | 5.M.1.2 | 1 | 5.N.2.1 | 1 | 5.M.1.2 | 1 | 5.N.2.1 | 1 | 5.M.1.2 |

Table 5.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 5

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 39 | 1 | 5.M.1.4 |
| 40 | | | | | | | | | | | | | | |
| 41 | | | | | | | | | | | | | | |
| 42 | | | | | | | | | | | | | | |
| 43 | 2 | 5.M.1.2 | 2 | 5.M.1.2 | 2 | 5.M.1.2 | 2 | 5.M.1.2 | 1 | 5.M.1.2 | 2 | 5.M.1.2 | 2 | 5.S.1.1 |
| 44 | 2 | 5.N.3.1 | 1 | 5.N.3.1 | 2 | 5.N.3.1 |
| 45 | 2 | 5.S.1.2 | 2 | 5.S.1.2 | 3 | 5.S.1.2 | 2 | 5.S.1.2 | 2 | 5.S.1.2 | 2 | 5.S.1.2 | 2 | 5.S.1.2 |
| 46 | 2 | 5.A.1.1 |
| 47 | 1 | 5.G.1.1 | 2 | 5.G.1.1 | 1 | 5.G.1.1 | 1 | 5.G.1.1 | 1 | 5.G.1.2 | 2 | 5.G.1.1 | 1 | 5.G.1.1 |
| 48 | 1 | 5.N.3.1 | 1 | 5.N.3.1 | 2 | 5.N.3.1 | 2 | 5.N.3.1 | 1 | 5.A.3.1 | 2 | 5.N.3.1 | 1 | 5.N.3.1 |
| 49 | 1 | 5.A.1.2 |
| 50 | 2 | 5.N.3.1 |
| 51 | 2 | 5.S.2.1 | 2 | 5.S.2.1 | 1 | 5.S.2.1 |
| 52 | 2 | 5.A.1.2 | 1 | 5.A.1.2 | 2 | 5.A.1.2 |
| 53 | 2 | 5.S.2.2 |
| 54 | 1 | 5.A.1.2 | 2 | 5.A.1.2 | 1 | 5.A.1.2 |
| 55 | 1 | 5.N.2.1 |
| 56 | 2 | 5.N.3.1 | 1 | 5.N.2.1 |
| 57 | 2 | 5.S.1.1 |
| 58 | 2 | 5.A.3.1 | 1 | 5.A.3.1 | 2 | 5.A.3.1 |
| 59 | 1 | 5.G.2.3 |
| 60 | 2 | 5.G.2.1 | 2 | 5.G.2.1 | 1 | 5.G.2.1 | 2 | 5.G.2.1 | 2 | 5.G.2.1 | 1 | 5.G.2.1 | 1 | 5.G.2.1 |
| 61 | 1 | 5.M.1.2 | 1 | 5.M.1.2 | 1 | 5.M.1.2 | 1 | 5.M.1.2 | 2 | 5.M.1.2 | 1 | 5.M.1.2 | 1 | 5.M.1.2 |
| 62 | 2 | 5.A.1.1 | 1 | 5.A.1.1 |
| 63 | 2 | 5.A.3.2 | 2 | 5.N.3.1 | 2 | 5.N.3.1 | 2 | 5.N.3.1 | 2 | 5.N.3.1 | 2 | 5.A.3.2 | 2 | 5.N.3.1 |
| 64 | 2 | 5.S.1.1 |
| 65 | 1 | 5.G.1.1 | 1 | 5.G.1.1 | 1 | 5.G.1.1 | 1 | 5.G.1.1 | 2 | 5.G.1.1 | 1 | 5.G.1.1 | 1 | 5.G.1.1 |
| 66 | 1 | 5.M.1.2 |
| 67 | 2 | 5.A.2.1 | 2 | 5.A.2.1 | 2 | 5.A.2.1 | 2 | 5.A.2.1 | 1 | 5.A.2.1 | 1 | 5.A.2.1 | 2 | 5.A.2.1 |
| 68 | 1 | 5.N.2 |
| 69 | 1 | 5.G.1.2 |
| 70 | 2 | 5.G.2.1 |
| 71 | 2 | 5.A.4.1 |
| 72 | 1 | 5.M.1.3 | 2 | 5.M.1.3 | 1 | 5.M.1.3 | 2 | 5.M.1.3 | 1 | 5.M.1.3 | 2 | 5.M.1.3 | 1 | 5.M.1.3 |
| 73 | 2 | 5.S.1.1 | 1 | 5.S.1.1 |
| 74 | 1 | 5.M.1.2 |
| 75 | 1 | 5.G.1.2 |
| 76 | 2 | 5.A.3.1 |

Table 5.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 5

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 77 | 2 | 5.A.2.1 |
| 78 | 2 | 5.A.1.1 | 1 | 5.A.1.1 | 1 | 5.A.1.1 | 2 | 5.A.1.1 | 1 | 5.A.1.1 | 1 | 5.A.1.1 | 1 | 5.A.1.1 |
| 79 | 2 | 5.M.1.4 |
| 80 | 2 | 5.G.2.3 | 1 | 5.G.2.3 |
| 81 | | | | | | | | | | | | | | |
| 82 | | | | | | | | | | | | | | |
| 83 | 2 | 5.A.1.1 | 2 | 5.A.1.1 | 1 | 5.A.1.1 | 2 | 5.A.1.1 | 2 | 5.A.1.1 | 1 | 5.A.1.1 | 1 | 5.A.1.1 |
| 84 | 1 | 5.N.2.1 | 2 | 5.N.2.1 | 1 | 5.N.2.1 | 1 | 5.N.2.1 | 1 | 5.S.2.1 | 1 | 5.N.2.1 | 1 | 5.N.2.1 |
| 85 | 1 | 5.A.1.2 | 1 | 5.A.1.2 | 1 | 5.A.2.1 | 1 | 5.A.1.2 | 1 | 5.S.2.1 | 1 | 5.A.1.2 | 1 | 5.A.1.2 |
| 86 | 2 | 5.A.2.1 | 2 | 5.A.2.1 | 1 | 5.A.2.1 | 2 | 5.A.2.1 | 2 | 5.A.2.1 | 2 | 5.A.2.1 | 1 | 5.A.2.1 |
| 87 | 1 | 5.A.4.1 | 1 | 5.A.4.1 | 2 | 5.A.4.1 | 2 | 5.A.4.1 | 1 | 5.A.4.1 | 2 | 5.A.4.1 | 2 | 5.A.4.1 |
| 88 | 2 | 5.M.1.4 | 2 | 5.M.1.4 | 2 | 5.N.3.1 |
| 89 | 2 | 5.A.4 | 2 | 5.A.4.1 | 2 | 5.A.4 |
| 90 | 2 | 5.N.3.1 | 2 | 5.N.3.1 | 2 | 5.N.3.1 | 2 | 5.N.3.1 | 2 | 5.N.2.3 | 2 | 5.N.3.1 | 2 | 5.N.3.1 |
| 91 | 1 | 5.G.1.1 |
| 92 | 2 | 5.S.2.1 | 2 | 5.S.2.1 | 1 | 5.S.2.1 | 1 | 5.S.2.1 | 1 | 5.S.2.1 | 1 | 5.S.2 | 1 | 5.S.2.1 |

Objective Pairwise Comparison: 0.9155
Standard Pairwise Comparison: 0.9626

Table 5.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 5

| Low | | Medium | | High | | | |
|------------|---------|----------|---------|---------|---------|---------|---------|
| 0 | | 6.391304 | | 7 | | | |
| 1 3528669 | 5.N.1 | 5.N.1 | 5.N.2 | 5.N.2 | 5.N.2 | 5.N.2 | 5.N.2 |
| 2 3351216 | 5.A.3.2 | 5.A.3.2 | 5.A.3.2 | 5.A.3.2 | 5.A.3.2 | 5.A.3.2 | 5.A.3.2 |
| 3 2177124 | 5.G.1.1 | 5.G.1.1 | 5.G.1.1 | 5.G.1.1 | 5.G.1.1 | 5.G.1.1 | 5.G.1.1 |
| 4 2345787 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 |
| 5 3351215 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 |
| 6 2177195 | 5.S.2.1 | 5.S.2.1 | 5.S.2.1 | 5.S.2.1 | 5.S.2.1 | 5.S.2.1 | 5.S.2.1 |
| 7 3328673 | 5.G.2.3 | 5.G.2.3 | 5.G.2.3 | 5.G.2.3 | 5.G.2.3 | 5.G.2.3 | 5.G.2.3 |
| 8 2177138 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 |
| 9 2345771 | 5.G.2.1 | 5.G.2.1 | 5.G.2.1 | 5.G.2.1 | 5.G.2.1 | 5.G.2.1 | 5.G.2.1 |
| 10 2177166 | 5.N.1.1 | 5.N.1.1 | 5.N.1.1 | 5.N.1.1 | 5.N.1.1 | 5.N.1.1 | 5.N.1.1 |
| 11 3529465 | 5.N.1.4 | 5.N.1.4 | 5.N.1.4 | 5.N.1.4 | 5.N.1.4 | 5.N.1.4 | 5.N.1.4 |
| 12 3328817 | 5.N.2.2 | 5.N.2.2 | 5.N.2.2 | 5.N.2.2 | 5.N.2.2 | 5.N.2.2 | 5.N.2.2 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 3344789 | 5.A.1.1 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 | 5.N.2.1 |
| 17 2345776 | 5.M.1.4 | 5.M.1.4 | 5.M.1.4 | 5.M.1.4 | 5.M.1.4 | 5.M.1.4 | 5.M.1.4 |
| 18 2177191 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 |
| 19 3529472 | 5.M.1.1 | 5.M.1.1 | 5.M.1.1 | 5.M.1.1 | 5.M.1.1 | 5.M.1.1 | 5.M.1.1 |
| 20 2177161 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 |
| 21 3529469 | 5.N.2.2 | 5.N.2.2 | 5.N.2.2 | 5.N.2.2 | 5.N.2.2 | 5.N.2.2 | 5.N.2.2 |
| 22 2177188 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 |
| 23 2177142 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 |
| 24 2345770 | 5.A.2.1 | 5.A.3.1 | 5.A.3.1 | 5.A.3.1 | 5.A.3.1 | 5.A.3.1 | 5.A.3.1 |
| 25 2177165 | 5.N.1.1 | 5.N.1.1 | 5.N.1.1 | 5.N.1.1 | 5.N.1.1 | 5.N.1.1 | 5.N.1.1 |
| 26 3529474 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 |
| 27 3328812 | 5.A.4.1 | 5.A.4.1 | 5.A.4.1 | 5.A.4.1 | 5.A.4.1 | 5.A.4.1 | 5.A.4.1 |
| 28 2345765 | 5.N.1.1 | 5.S.1 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 | 5.S.1.1 |
| 29 2177151 | 5.N.1.3 | 5.N.1.3 | 5.N.1.3 | 5.N.1.3 | 5.N.1.3 | 5.N.1.3 | 5.N.1.3 |
| 30 3529470 | 5.N.1 | 5.N.1 | 5.N.1 | 5.N.1 | 5.N.1 | 5.N.1 | 5.N.1 |
| 31 3344792 | 5.A.1.1 | 5.A.1.1 | 5.A.1.1 | 5.A.1.1 | 5.A.1.1 | 5.A.1.1 | 5.A.1.2 |
| 32 2345773 | 5.G.1.2 | 5.G.1.2 | 5.G.1.2 | 5.G.1.2 | 5.G.1.2 | 5.G.1.2 | 5.G.1.2 |
| 33 3351219 | 5.A.3.1 | 5.A.3.1 | 5.A.4.1 | 5.A.4.1 | 5.A.4.1 | 5.A.4.1 | 5.A.4.1 |
| 34 3529464 | 5.N.1.4 | 5.N.1.4 | 5.N.1.4 | 5.N.1.4 | 5.N.1.4 | 5.N.1.4 | 5.N.1.4 |
| 35 2177134 | 5.G.2.3 | 5.G.2.3 | 5.G.2.3 | 5.G.2.3 | 5.G.2.3 | 5.G.2.3 | 5.G.2.3 |
| 36 2177121 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 | 5.A.2.1 |
| 37 3529477 | 5.S.2 | 5.S.2 | 5.S.2 | 5.S.2 | 5.S.2 | 5.S.2 | 5.S.2.2 |
| 38 2177171 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.N.2.1 | 5.N.2.1 |

Table 5.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 5

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 39 3547120 | 5.M.1.4 |
| 40 | | | | | | | |
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 3528677 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.M.1.2 | 5.S.1.1 |
| 44 3351227 | 5.N.3.1 |
| 45 3529476 | 5.S.1.2 |
| 46 3351209 | 5.A.1.1 |
| 47 3351222 | 5.G.1.1 | 5.G.1.1 | 5.G.1.1 | 5.G.1.1 | 5.G.1.1 | 5.G.1.1 | 5.G.1.2 |
| 48 2345767 | 5.A.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 |
| 49 2177112 | 5.A.1.2 |
| 50 3529473 | 5.N.3.1 |
| 51 2177194 | 5.S.2.1 |
| 52 3351211 | 5.A.1.2 |
| 53 3529480 | 5.S.2.2 |
| 54 3528668 | 5.A.1.2 |
| 55 3529468 | 5.N.2.1 |
| 56 3328587 | 5.N.2.1 | 5.N.2.1 | 5.N.2.1 | 5.N.2.1 | 5.N.2.1 | 5.N.2.1 | 5.N.3.1 |
| 57 2177185 | 5.S.1.1 |
| 58 2177101 | 5.A.3.1 |
| 59 3528684 | 5.G.2.3 |
| 60 3328583 | 5.G.2.1 |
| 61 3528686 | 5.M.1.2 |
| 62 3344797 | 5.A.1.1 |
| 63 2177137 | 5.A.3.2 | 5.A.3.2 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 |
| 64 3529479 | 5.S.1.1 |
| 65 3351224 | 5.G.1.1 |
| 66 2345779 | 5.M.1.2 |
| 67 3344798 | 5.A.2.1 |
| 68 3528671 | 5.N.2 |
| 69 3328582 | 5.G.1.2 |
| 70 2177136 | 5.G.2.1 |
| 71 3351217 | 5.A.4.1 |
| 72 2177146 | 5.M.1.3 |
| 73 2177115 | 5.S.1.1 |
| 74 2345780 | 5.M.1.2 |
| 75 3328581 | 5.G.1.2 |
| 76 2345774 | 5.A.3.1 |
| 77 2177181 | 5.A.2.1 |
| 78 3344800 | 5.A.1.1 |
| 79 2345775 | 5.M.1.4 |
| 80 3328674 | 5.G.2.3 |

Table 5.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 5

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 3351207 | 5.A.1.1 |
| 84 3529467 | 5.N.2.1 | 5.N.2.1 | 5.N.2.1 | 5.N.2.1 | 5.N.2.1 | 5.N.2.1 | 5.S.2.1 |
| 85 3328811 | 5.A.1.2 | 5.A.1.2 | 5.A.1.2 | 5.A.1.2 | 5.A.1.2 | 5.A.2.1 | 5.S.2.1 |
| 86 3351213 | 5.A.2.1 |
| 87 3345114 | 5.A.4.1 |
| 88 3344787 | 5.M.1.4 | 5.M.1.4 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 |
| 89 2177182 | 5.A.4 | 5.A.4 | 5.A.4 | 5.A.4 | 5.A.4 | 5.A.4 | 5.A.4.1 |
| 90 3328819 | 5.N.2.3 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 | 5.N.3.1 |
| 91 3351225 | 5.G.1.1 |
| 92 2177190 | 5.S.2 | 5.S.2.1 | 5.S.2.1 | 5.S.2.1 | 5.S.2.1 | 5.S.2.1 | 5.S.2.1 |

Table 5.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 5

| | | | | |
|-----|--|----------|--|------|
| Low | | Medium | | High |
| 0 | | 12.78261 | | 53 |

| | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5.A | | | | | | | | | | | | | | | | | | | | |
| 5.A.1 | | | | | | | | | | | | | | | | | | | | |
| 5.A.1.1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | |
| | 2 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | |
| 5.A.1.2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 1 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 |
| | 5 | 5 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | |
| | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | | | | | |
| 5.A.2 | | | | | | | | | | | | | | | | | | | | |
| 5.A.2.1 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 6 | 6 | 6 | 6 | 6 |
| | 8 | 8 | 8 | | | | | | | | | | | | | | | | | |
| | 6 | 6 | 6 | | | | | | | | | | | | | | | | | |
| 5.A.3 | | | | | | | | | | | | | | | | | | | | |
| 5.A.3.1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 7 | 7 | 7 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 6 | 6 | 6 |
| | 7 | 7 | 7 | | | | | | | | | | | | | | | | | |
| | 6 | 6 | 6 | | | | | | | | | | | | | | | | | |
| 5.A.3.2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | | | | | | | | | | | |
| | | | | | | | | 3 | 3 | | | | | | | | | | | |
| 5.A.4 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | | | | | | | | | | | |
| 5.A.4.1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 9 | | | | | | | | | | | | | |
| 5.G | | | | | | | | | | | | | | | | | | | | |
| 5.G.1 | | | | | | | | | | | | | | | | | | | | |
| 5.G.1.1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 |
| | | | | | | | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | | | | | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | |
| 5.G.1.2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 5 | 5 | 5 | 5 | 5 |
| | 7 | 7 | | | | | | | | | | | | | | | | | | |

Table 5.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 5

| | | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 5 | | | | | | | | | | | | | | | | | | | |
| 5.G.2 | | | | | | | | | | | | | | | | | | | | | |
| 5.G.2.1 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 7 | 0 | | | | | | | | | | | | | | | | | | | |
| 5.G.2.2 | | | | | | | | | | | | | | | | | | | | | |
| 5.G.2.3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 5 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | |
| | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| 5.M | | | | | | | | | | | | | | | | | | | | | |
| 5.M.1 | | | | | | | | | | | | | | | | | | | | | |
| 5.M.1.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | | | | | | | | | | | | |
| 5.M.1.2 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 2 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 3 | 8 | 8 | 8 | 8 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | |
| 5.M.1.3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | | | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | |
| 5.M.1.4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| | 7 | 8 | 8 | | | | | | | | | | | | | | | | | | |
| | 9 | 8 | 8 | | | | | | | | | | | | | | | | | | |
| 5.N | | | | | | | | | | | | | | | | | | | | | |
| 5.N.1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | |
| 5.N.1.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 8 |
| 5.N.1.2 | | | | | | | | | | | | | | | | | | | | | |
| 5.N.1.3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | | | | | | | | | | | | |
| 5.N.1.4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 5.N.1.5 | | | | | | | | | | | | | | | | | | | | | |
| 5.N.2 | 1 | 1 | 1 | 1 | 1 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | |
| | | | | | | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | |

Table 5.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 5

| | | | | | | | | | | | | | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 5.N.2.1 | 1 6 | 3 8 | 3 8 | 5 5 | 5 6 | 5 6 | 5 6 | 5 6 | 5 6 | 8 4 | 8 4 | 8 4 | 8 4 |
| | 8 4 | 8 4 | | | | | | | | | | | | | | | | | | |
| 5.N.2.2 | 1 2 | 2 1 | | | | |
| 5.N.2.3 | 9 0 | | | | | | | | | | | | | | | | | | | |
| 5.N.3 | | | | | | | | | | | | | | | | | | | | |
| 5.N.3.1 | 4 4 | 4 8 | 4 8 | 4 8 | 4 8 | 4 8 | 4 8 | 1 0 | 4 6 | 4 3 | 4 3 | 4 3 | 4 3 |
| | 4 4 | 4 8 | 4 8 | 4 8 | 4 8 | 4 8 | 4 8 | 5 0 | 5 6 | 6 3 | 6 3 | 6 3 | 6 3 |
| | 6 3 | 8 8 | 8 8 | 8 8 | 8 8 | 8 8 | 9 0 | | | | | |
| 5.S | | | | | | | | | | | | | | | | | | | | |
| 5.S.1 | 2 8 | | | | | | | | | | | | | | | | | | | |
| 5.S.1.1 | 2 2 | 2 6 | 2 8 | 2 8 | 2 8 | 2 8 | 2 8 |
| | 5 7 | 6 4 | 7 3 | 7 3 | 7 3 | 7 3 | 7 3 |
| | 7 3 | 7 3 | | | | | | | | | | | | | | | | | | |
| 5.S.1.2 | 4 5 | | | | | | | | | | | | | |
| 5.S.2 | 3 7 | 3 7 | 3 7 | 3 7 | 3 7 | 3 7 | 9 2 | | | | | | | | | | | | | |
| 5.S.2.1 | 6 9 | 5 1 | 8 4 | 8 5 | 9 2 | 9 2 | 9 2 |
| | 9 2 | 9 2 | | | | | | | | | | | | | | | | | | |
| 5.S.2.2 | 3 7 | 5 3 | | | | | |

Table 5.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 5

| Low | | Medium | | High | | | | | |
|---------|------|--------|------|------|------|------|------|------|------|
| 1 | | 3 | | 7 | | | | | |
| 5.A | | | | | | | | | |
| 5.A.1 | | | | | | | | | |
| 5.A.1.1 | 16:1 | 31:6 | 46:7 | 62:7 | 78:7 | 83:7 | | | |
| 5.A.1.2 | 31:1 | 49:7 | 52:7 | 54:7 | 85:5 | | | | |
| 5.A.2 | | | | | | | | | |
| 5.A.2.1 | 5:7 | 16:5 | 24:1 | 36:7 | 67:7 | 77:7 | 85:1 | 86:7 | |
| 5.A.3 | | | | | | | | | |
| 5.A.3.1 | 24:6 | 33:2 | 48:1 | 58:7 | 76:7 | | | | |
| 5.A.3.2 | 2:7 | 63:2 | | | | | | | |
| 5.A.4 | 89:6 | | | | | | | | |
| 5.A.4.1 | 27:7 | 33:5 | 71:7 | 87:7 | 89:1 | | | | |
| 5.G | | | | | | | | | |
| 5.G.1 | | | | | | | | | |
| 5.G.1.1 | 3:7 | 47:6 | 65:7 | 91:7 | | | | | |
| 5.G.1.2 | 32:7 | 47:1 | 69:7 | 75:7 | | | | | |
| 5.G.2 | | | | | | | | | |
| 5.G.2.1 | 9:7 | 60:7 | 70:7 | | | | | | |
| 5.G.2.2 | | | | | | | | | |
| 5.G.2.3 | 7:7 | 35:7 | 59:7 | 80:7 | | | | | |
| 5.M | | | | | | | | | |
| 5.M.1 | | | | | | | | | |
| 5.M.1.1 | 19:7 | | | | | | | | |
| 5.M.1.2 | 8:7 | 20:7 | 23:7 | 38:5 | 43:6 | 61:7 | 66:7 | 74:7 | |
| 5.M.1.3 | 72:7 | | | | | | | | |
| 5.M.1.4 | 17:7 | 39:7 | 79:7 | 88:2 | | | | | |
| 5.N | | | | | | | | | |
| 5.N.1 | 1:2 | 30:7 | | | | | | | |
| 5.N.1.1 | 10:7 | 25:7 | 28:1 | | | | | | |
| 5.N.1.2 | | | | | | | | | |
| 5.N.1.3 | 29:7 | | | | | | | | |
| 5.N.1.4 | 11:7 | 34:7 | | | | | | | |
| 5.N.1.5 | | | | | | | | | |
| 5.N.2 | 1:5 | 68:7 | | | | | | | |
| 5.N.2.1 | 16:1 | 38:2 | 55:7 | 56:6 | 84:6 | | | | |
| 5.N.2.2 | 12:7 | 21:7 | | | | | | | |
| 5.N.2.3 | 90:1 | | | | | | | | |
| 5.N.3 | | | | | | | | | |
| 5.N.3.1 | 4:7 | 18:7 | 44:7 | 48:6 | 50:7 | 56:1 | 63:5 | 88:5 | 90:6 |

Table 5.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
South Dakota Mathematics 2008 Grade 5

| | | | | | | | |
|---------|------|------|------|------|------|------|------|
| 5.S | | | | | | | |
| 5.S.1 | 28:1 | | | | | | |
| 5.S.1.1 | 22:7 | 26:7 | 28:5 | 43:1 | 57:7 | 64:7 | 73:7 |
| 5.S.1.2 | 45:7 | | | | | | |
| 5.S.2 | 37:6 | 92:1 | | | | | |
| 5.S.2.1 | 6:7 | 51:7 | 84:1 | 85:1 | 92:6 | | |
| 5.S.2.2 | 37:1 | 53:7 | | | | | |

Table 5.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 5

| Low | | Medium | | High |
|-----|--|--------|--|------|
| 1 | | 3 | | 7 |

| | | | | |
|------------|-----------|-----------|-----------|--|
| 1 3528669 | 5.N.1.2 | 5.N.2.5 | | |
| 2 3351216 | 5.A.3.2:7 | | | |
| 3 2177124 | 5.G.1.1:7 | | | |
| 4 2345787 | 5.N.3.1:7 | | | |
| 5 3351215 | 5.A.2.1:7 | | | |
| 6 2177195 | 5.S.2.1:7 | | | |
| 7 3328673 | 5.G.2.3:7 | | | |
| 8 2177138 | 5.M.1.2:7 | | | |
| 9 2345771 | 5.G.2.1:7 | | | |
| 10 2177166 | 5.N.1.1:7 | | | |
| 11 3529465 | 5.N.1.4:7 | | | |
| 12 3328817 | 5.N.2.2:7 | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 3344789 | 5.A.1.1:1 | 5.A.2.1:5 | 5.N.2.1:1 | |
| 17 2345776 | 5.M.1.4:7 | | | |
| 18 2177191 | 5.N.3.1:7 | | | |
| 19 3529472 | 5.M.1.1:7 | | | |
| 20 2177161 | 5.M.1.2:7 | | | |
| 21 3529469 | 5.N.2.2:7 | | | |
| 22 2177188 | 5.S.1.1:7 | | | |
| 23 2177142 | 5.M.1.2:7 | | | |
| 24 2345770 | 5.A.2.1:1 | 5.A.3.1:6 | | |
| 25 2177165 | 5.N.1.1:7 | | | |
| 26 3529474 | 5.S.1.1:7 | | | |
| 27 3328812 | 5.A.4.1:7 | | | |
| 28 2345765 | 5.N.1.1:1 | 5.S.1.1 | 5.S.1.1:5 | |
| 29 2177151 | 5.N.1.3:7 | | | |
| 30 3529470 | 5.N.1:7 | | | |
| 31 3344792 | 5.A.1.1:6 | 5.A.1.2:1 | | |
| 32 2345773 | 5.G.1.2:7 | | | |
| 33 3351219 | 5.A.3.1:2 | 5.A.4.1:5 | | |
| 34 3529464 | 5.N.1.4:7 | | | |
| 35 2177134 | 5.G.2.3:7 | | | |
| 36 2177121 | 5.A.2.1:7 | | | |
| 37 3529477 | 5.S.2:6 | 5.S.2.2:1 | | |
| 38 2177171 | 5.M.1.2:5 | 5.N.2.1:2 | | |

Table 5.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 5

| | | |
|------------|-----------|-----------|
| 39 3547120 | 5.M.1.4:7 | |
| 40 | | |
| 41 | | |
| 42 | | |
| 43 3528677 | 5.M.1.2:6 | 5.S.1.1:1 |
| 44 3351227 | 5.N.3.1:7 | |
| 45 3529476 | 5.S.1.2:7 | |
| 46 3351209 | 5.A.1.1:7 | |
| 47 3351222 | 5.G.1.1:6 | 5.G.1.2:1 |
| 48 2345767 | 5.A.3.1:1 | 5.N.3.1:6 |
| 49 2177112 | 5.A.1.2:7 | |
| 50 3529473 | 5.N.3.1:7 | |
| 51 2177194 | 5.S.2.1:7 | |
| 52 3351211 | 5.A.1.2:7 | |
| 53 3529480 | 5.S.2.2:7 | |
| 54 3528668 | 5.A.1.2:7 | |
| 55 3529468 | 5.N.2.1:7 | |
| 56 3328587 | 5.N.2.1:6 | 5.N.3.1:1 |
| 57 2177185 | 5.S.1.1:7 | |
| 58 2177101 | 5.A.3.1:7 | |
| 59 3528684 | 5.G.2.3:7 | |
| 60 3328583 | 5.G.2.1:7 | |
| 61 3528686 | 5.M.1.2:7 | |
| 62 3344797 | 5.A.1.1:7 | |
| 63 2177137 | 5.A.3.2:2 | 5.N.3.1:5 |
| 64 3529479 | 5.S.1.1:7 | |
| 65 3351224 | 5.G.1.1:7 | |
| 66 2345779 | 5.M.1.2:7 | |
| 67 3344798 | 5.A.2.1:7 | |
| 68 3528671 | 5.N.2:7 | |
| 69 3328582 | 5.G.1.2:7 | |
| 70 2177136 | 5.G.2.1:7 | |
| 71 3351217 | 5.A.4.1:7 | |
| 72 2177146 | 5.M.1.3:7 | |
| 73 2177115 | 5.S.1.1:7 | |
| 74 2345780 | 5.M.1.2:7 | |
| 75 3328581 | 5.G.1.2:7 | |
| 76 2345774 | 5.A.3.1:7 | |
| 77 2177181 | 5.A.2.1:7 | |
| 78 3344800 | 5.A.1.1:7 | |
| 79 2345775 | 5.M.1.4:7 | |
| 80 3328674 | 5.G.2.3:7 | |

Table 5.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
South Dakota Mathematics 2008 Grade 5

| | | | |
|------------|-----------|-----------|-----------|
| 81 | | | |
| 82 | | | |
| 83 3351207 | 5.A.1.1:7 | | |
| 84 3529467 | 5.N.2.1:6 | 5.S.2.1:1 | |
| 85 3328811 | 5.A.1.2:5 | 5.A.2.1:1 | 5.S.2.1:1 |
| 86 3351213 | 5.A.2.1:7 | | |
| 87 3345114 | 5.A.4.1:7 | | |
| 88 3344787 | 5.M.1.4:2 | 5.N.3.1:5 | |
| 89 2177182 | 5.A.4:6 | 5.A.4.1:1 | |
| 90 3328819 | 5.N.2.3:1 | 5.N.3.1:6 | |
| 91 3351225 | 5.G.1.1:7 | | |
| 92 2177190 | 5.S.2:1 | 5.S.2.1:6 | |

Table 5.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 5

| Low DOK | | Matched DOK | | High DOK |
|---------|--|-------------|--|----------|
| 1 | | 3 | | 7 |

| | | | | | | | | |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|--------------------|
| 5.A [2]: | | | | | | | | |
| 5.A. 1 [2]: | | | | | | | | |
| 5.A. 1.1 [2]: | 16:1 [2] | 31:6 [1.3 3] | 46:7 [2] | 62:7 [1.1 4] | 78:7 [1.2 9] | 83:7 [1.5 7] | | |
| 5.A. 1.2 [1]: | 31:1 [2] | 49:7 [1] | 52:7 [1.8 6] | 54:7 [1.1 4] | 85:5 [1] | | | |
| 5.A. 2 [2]: | | | | | | | | |
| 5.A. 2.1 [2]: | 5:7[2] | 16:5 [2] | 24:1 [2] | 36:7 [1] | 67:7 [1.7 1] | 77:7 [2] | 85:1 [1] | 86:7 [1.7 1] |
| 5.A. 3 [2]: | | | | | | | | |
| 5.A. 3.1 [2]: | 24:6 [1.6 7] | 33:2 [2] | 48:1 [1] | 58:7 [1.8 6] | 76:7 [2] | | | |
| 5.A. 3.2 [1]: | 2:7[1.86] | 63:2 [2] | | | | | | |
| 5.A. 4 [2]: | 89:6 [2] | | | | | | | |
| 5.A. 4.1 [2]: | 27:7 [1.5 7] | 33:5 [2] | 71:7 [2] | 87:7 [1.5 7] | 89:1 [2] | | | |
| 5.G [1]: | | | | | | | | |
| 5.G. 1 [1]: | | | | | | | | |
| 5.G. | 3:7[| 47:6 | 65:7 | 91:7 | | | | |

Table 5.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 5

| | | | | | |
|---------------------|-------------|--------------------|-------------|-------------|--------------------|
| 5.S. 2.1 [1]: | 6:7[1] | 51:7 [1.2 9] | 84:1 [1] | 85:1 [1] | 92:6 [1.3 3] |
| 5.S. 2.2 [2]: | 37:1 [1] | 53:7 [2] | | | |

Table 6.1
Categorical Concurrence Between Standards and Assessment as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 6
Number of Assessment Items - 84

| Standards | | | Level by Objective | | | Hits | | Cat. Concurr. |
|-------------------------------------|------------|-----------|--------------------|-----------------------|------------------------|-------|------|------------------|
| Title | Goals # | Objs # | Level | # of objs by Level | % w/in std by Level | Mean | S.D. | |
| 6.A - ALGEBRA | 4 | 6 | 1 2 | 3 3 | 50 50 | 32.14 | 0.64 | YES |
| 6.G - GEOMETRY | 2 | 4 | 1 2 | 1 2 | 33 66 | 14 | 0 | YES |
| 6.M - MEASUREMENT | 1 | 2 | 1 | 2 | 100 | 7.14 | 0.35 | YES |
| 6.N - NUMBER SENSE | 3 | 5 | 1 2 | 3 1 | 75 25 | 16.86 | 0.64 | YES |
| 6.S - STATISTICS AND PROBABILITY | 2 | 4 | 1 3 | 2 1 | 66 33 | 13.86 | 0.35 | YES |
| Total | 12 | 21 | 1 2 3 | 11 6 1 | 61 33 5 | 84 | 0 | |

Table 6.2a

Alternate Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Seven Reviewers (Does Not Assume Each Objective Should Have Equal Representation)

South Dakota Mathematics 2008 Grade 6

Number of Assessment Items - 84

| Standards | | | Hits | | Level of Item w.r.t. Standard | | | | | | DOK Consistency |
|----------------------------------|---------|--------|-------|------|-------------------------------|------|------|------|---------|------|-----------------|
| | | | | | % Under | | % At | | % Above | | |
| Title | Goals # | Objs # | M | S.D. | M | S.D. | M | S.D. | M | S.D. | |
| 6.A - ALGEBRA | 4 | 6 | 32.14 | 0.64 | 32 | 267 | 58 | 30 | 10 | 20 | YES |
| 6.G - GEOMETRY | 2 | 4 | 14 | 0 | 51 | 200 | 43 | 34 | 6 | 19 | WEAK |
| 6.M - MEASUREMENT | 1 | 2 | 7.14 | 0.35 | 0 | 0 | 58 | 28 | 42 | 28 | YES |
| 6.N - NUMBER SENSE | 3 | 5 | 16.86 | 0.64 | 1 | 17 | 88 | 19 | 11 | 19 | YES |
| 6.S - STATISTICS AND PROBABILITY | 2 | 4 | 13.86 | 0.35 | 34 | 222 | 39 | 46 | 27 | 38 | YES |
| Total | 12 | 21 | 84 | 0 | 23 | 37 | 61 | 36 | 16 | 27 | |

Table 6.3

Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Seven Reviewers

South Dakota Mathematics 2008 Grade 6

Number of Assessment Items - 84

| Standards | | | Hits | | Range of Objectives | | | | Rng. of Know. | Balance Index | | | | Bal. of Represent. |
|----------------------------------|---------|--------|-------|------|---------------------|------|------------|------|---------------|------------------------|------|-------|------|--------------------|
| | | | | | # Objs Hit | | % of Total | | | % Hits in Std/Ttl Hits | | Index | | |
| Title | Goals # | Objs # | Mean | S.D. | Mean | S.D. | Mean | S.D. | | Mean | S.D. | Mean | S.D. | |
| 6.A - ALGEBRA | 4 | 6 | 32.14 | 0.64 | 6 | 0 | 100 | 0 | YES | 38 | 1 | 0.81 | 0.02 | YES |
| 6.G - GEOMETRY | 2 | 4 | 14 | 0 | 4 | 0 | 100 | 0 | YES | 17 | 0 | 0.76 | 0.04 | YES |
| 6.M - MEASUREMENT | 1 | 2 | 7.14 | 0.35 | 2 | 0 | 100 | 0 | YES | 9 | 0 | 0.94 | 0.02 | YES |
| 6.N - NUMBER SENSE | 3 | 5 | 16.86 | 0.64 | 5 | 0 | 100 | 0 | YES | 20 | 1 | 0.83 | 0.02 | YES |
| 6.S - STATISTICS AND PROBABILITY | 2 | 4 | 13.86 | 0.35 | 4 | 0 | 100 | 0 | YES | 16 | 0 | 0.77 | 0.04 | YES |
| Total | 12 | 21 | 84 | 0 | 4.2 | 1.33 | 100 | 0 | | 20 | 10 | 0.82 | 0.07 | |

Table 6.4

Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 6
Number of Assessment Items - 84

| Standards | Alignment Criteria | | | |
|----------------------------------|-------------------------|--------------------------------|--------------------|---------------------------|
| | Categorical Concurrence | Depth-of-Knowledge Consistency | Range of Knowledge | Balance of Representation |
| 6.A - ALGEBRA | YES | YES | YES | YES |
| 6.G - GEOMETRY | YES | WEAK | YES | YES |
| 6.M - MEASUREMENT | YES | YES | YES | YES |
| 6.N - NUMBER SENSE | YES | YES | YES | YES |
| 6.S - STATISTICS AND PROBABILITY | YES | YES | YES | YES |

Table 6.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 6

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 3 | 1 | 2 | 2 | 2 | 2 | 2 | 1 |
| 4 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |
| 5 | 1 | 2 | 1 | 1 | 1 | 1 | 2 |
| 6 | 1 | 1 | 1 | 2 | 2 | 1 | 1 |
| 7 | 1 | 2 | 2 | 2 | 2 | 1 | 1 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 10 | 2 | 2 | 2 | 1 | 2 | 2 | 1 |
| 11 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 17 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 18 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 19 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 20 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 21 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 22 | 1 | 2 | 1 | 2 | 1 | 2 | 2 |
| 23 | 2 | 2 | 2 | 2 | 2 | 3 | 2 |
| 24 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 25 | 2 | 2 | 1 | 2 | 1 | 1 | 1 |
| 26 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 27 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| 28 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 29 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 30 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 31 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| 32 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 33 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 34 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 35 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 36 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 37 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 38 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 39 | 2 | 1 | 1 | 2 | 1 | 1 | 1 |
| 40 | | | | | | | |

Table 6.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 6

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 44 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 45 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| 46 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 47 | 1 | 1 | 1 | 2 | 2 | 1 | 1 |
| 48 | 2 | 1 | 1 | 2 | 1 | 1 | 1 |
| 49 | 1 | 2 | 1 | 2 | 1 | 2 | 1 |
| 50 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 51 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 52 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 53 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 54 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 55 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| 56 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 57 | 2 | 2 | 1 | 2 | 1 | 1 | 1 |
| 58 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 59 | 2 | 1 | 2 | 2 | 1 | 1 | 1 |
| 60 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 61 | 1 | 1 | 2 | 1 | 1 | 1 | 2 |
| 62 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| 63 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| 64 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 65 | 2 | 2 | 1 | 2 | 2 | 1 | 2 |
| 66 | 1 | 2 | 1 | 2 | 1 | 2 | 1 |
| 67 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 68 | 2 | 2 | 1 | 1 | 1 | 2 | 2 |
| 69 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| 70 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| 71 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 72 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 73 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| 74 | 2 | 2 | 1 | 2 | 1 | 2 | 1 |
| 75 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 76 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 77 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| 78 | 2 | 1 | 2 | 1 | 1 | 1 | 1 |
| 79 | 2 | 1 | 1 | 2 | 1 | 1 | 1 |
| 80 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

Table 6.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 6

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 84 | 2 | 1 | 1 | 2 | 2 | 2 | 1 |
| 85 | 2 | 2 | 2 | 1 | 2 | 2 | 1 |
| 86 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 87 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 88 | 2 | 2 | 1 | 2 | 1 | 1 | 1 |
| 89 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 90 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 91 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 92 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |

Intraclass Correlation: 0.8648

Pairwise Comparison: 0.7381

Table 6.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 6

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 1 | 1 | 6.G.2 |
| 2 | 1 | 6.M.1.2 | 1 | 6.M.1.2 | 1 | 6.M.1.2 | 2 | 6.M.1.2 | 1 | 6.M.1.2 | 1 | 6.M.1.2 | 1 | 6.M.1.2 |
| 3 | 1 | 6.A.4.1 | 2 | 6.A.4.1 | 2 | 6.A.4.1 | 2 | 6.A.4.1 | 2 | 6.A.3.1 | 2 | 6.A.4.1 | 1 | 6.A.4.1 |
| 4 | 2 | 6.S.2.1 | 2 | 6.S.2.1 | 1 | 6.S.2.1 | 2 | 6.S.2.1 | 2 | 6.S.2.1 | 2 | 6.S.2.1 | 2 | 6.S.2.1 |
| 5 | 1 | 6.A.1.1 | 2 | 6.A.1.1 | 1 | 6.A.1.1 | 1 | 6.A.1.1 | 1 | 6.A.1.1 | 1 | 6.A.1.1 | 2 | 6.A.1.1 |
| 6 | 1 | 6.A.2.1 | 1 | 6.A.2.1 | 1 | 6.A.2.1 | 2 | 6.A.2.1 | 2 | 6.A.2.1 | 1 | 6.A.2.1 | 1 | 6.A.2.1 |
| 7 | 1 | 6.G.1.1 | 2 | 6.G.2.1 | 2 | 6.G.1.1 | 2 | 6.G.2.1 | 2 | 6.G.1.1 | 1 | 6.G.1.1 | 1 | 6.G.1.1 |
| 8 | 1 | 6.N.1.2 |
| 9 | 1 | 6.A.1.1 | 2 | 6.A.1.1 |
| 10 | 2 | 6.G.1.1 | 2 | 6.G.2.1 | 2 | 6.G.1.1 | 1 | 6.G.2.1 | 2 | 6.G.1.1 | 2 | 6.G.1.1 | 1 | 6.G.1.1 |
| 11 | 1 | 6.M.1.1 |
| 12 | 1 | 6.N.1.1 |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | 2 | 6.N.3.1 |
| 17 | 2 | 6.S.1.2 | 1 | 6.S.1.2 | 2 | 6.S.1.2 |
| 18 | 2 | 6.A.1.2 |
| 19 | 1 | 6.G.1.1 |
| 20 | 2 | 6.A.4.1 |
| 21 | 1 | 6.N.1.2 |
| 22 | 1 | 6.N.1.1 | 2 | 6.N.1.1 | 1 | 6.N.1.1 | 2 | 6.N.1.1 | 1 | 6.N.1.1 | 2 | 6.N.1.1 | 2 | 6.N.1.1 |
| 23 | 2 | 6.N.3.1 | 3 | 6.N.3.1 | 2 | 6.N.3.1 |
| 24 | 2 | 6.S.1.2 | 1 | 6.S.1.2 | 2 | 6.S.1.2 |
| 25 | 2 | 6.S.2.1 | 2 | 6.S.2.1 | 1 | 6.S.2.1 | 2 | 6.S.2.1 | 1 | 6.S.2.1 | 1 | 6.S.2.1 | 1 | 6.S.2.1 |
| 26 | 1 | 6.A.3.2 |
| 27 | 2 | 6.G.2.1 | 2 | 6.G.2.1 | 2 | 6.G.2.1 | 1 | 6.G.2.1 | 1 | 6.G.2.1 | 1 | 6.G.2.1 | 1 | 6.G.2.1 |
| 28 | 1 | 6.N.1.2 | 2 | 6.N.1.2 | 1 | 6.N.1.2 |
| 29 | 1 | 6.S.1.2 | 1 | 6.S.1.2 | 1 | 6.S.1.2 | 2 | 6.S.1.2 | 1 | 6.S.1.2 | 1 | 6.S.2.1 | 1 | 6.S.1.2 |
| 30 | 1 | 6.N.2 |
| 31 | 1 | 6.A.1.2 | 2 | 6.A.1.1 | 2 | 6.A.1.1 | 2 | 6.A.1.2 | 1 | 6.A.1.1 | 1 | 6.A.1.1 | 2 | 6.A.1.1 |
| 32 | 1 | 6.A.3.2 |
| 33 | 2 | 6.A.3.2 |
| 34 | 2 | 6.S.1.2 | 1 | 6.S.1.2 | 2 | 6.S.1.2 |
| 35 | 2 | 6.G.1.1 |
| 36 | 1 | 6.A.3.2 |
| 37 | 1 | 6.S.1.1 |
| 38 | 2 | 6.N.3.1 | 1 | 6.N.2.1 | 2 | 6.N.3.1 |

Table 6.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 6

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 39 | 2 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 | 2 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 |
| 40 | | | | | | | | | | | | | | |
| 41 | | | | | | | | | | | | | | |
| 42 | | | | | | | | | | | | | | |
| 43 | 1 | 6.N.2.1 |
| 44 | 1 | 6.A.3.2 | 1 | 6.A.3.2 | 1 | 6.A.3.2 | 2 | 6.N.1.2 | 1 | 6.A.3.2 | 1 | 6.A.3.2 | 1 | 6.A.3.2 |
| 45 | 1 | 6.A.2.1 | 1 | 6.A.2.1 | 2 | 6.A.2.1 | 2 | 6.A.2.1 | 1 | 6.A.2.1 | 1 | 6.A.2.1 | 1 | 6.A.2.1 |
| 46 | 1 | 6.G.2.1 | 1 | 6.G.2.1 | 1 | 6.G.2.1 | 1 | 6.G.2.1 | 1 | 6.G.1.1 | 1 | 6.G.2.1 | 1 | 6.G.2.1 |
| 47 | 1 | 6.A.4.1 | 1 | 6.A.4.1 | 1 | 6.A.4.1 | 2 | 6.A.4.1 | 2 | 6.A.4.1 | 1 | 6.A.4.1 | 1 | 6.A.4.1 |
| 48 | 2 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 | 2 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 |
| 49 | 1 | 6.G.1.2 | 2 | 6.G.1.2 | 1 | 6.G.1.2 | 2 | 6.G.1.2 | 1 | 6.G.1.2 | 2 | 6.G.1.2 | 1 | 6.G.1.2 |
| 50 | 1 | 6.M.1.1 |
| 51 | 2 | 6.N.1.2 | 2 | 6.M.1.2 | 2 | 6.N.1.2 | 2 | 6.N.1.2 | 2 | 6.N.1.2 | 1 | 6.N.1.2 | 2 | 6.N.1.2 |
| 52 | 1 | 6.S.1.1 | 1 | 6.S.1.1 | 1 | 6.S.1.1 | 2 | 6.S.1.1 | 1 | 6.S.1.1 | 1 | 6.S.1.1 | 1 | 6.S.1.1 |
| 53 | 1 | 6.A.3.2 |
| 54 | 2 | 6.A.3.2 |
| 55 | 1 | 6.G.1.1 | 1 | 6.G.1.1 | 2 | 6.G.1.1 | 1 | 6.G.1.2 | 1 | 6.G.1.1 | 1 | 6.G.1.1 | 1 | 6.G.1.1 |
| 56 | 1 | 6.A.3.2 |
| 57 | 2 | 6.S.2.1 | 2 | 6.S.2.1 | 1 | 6.S.2.1 | 2 | 6.S.2.1 | 1 | 6.S.2.1 | 1 | 6.S.2.1 | 1 | 6.S.2.1 |
| 58 | 1 | 6.N.2 |
| 59 | 2 | 6.A.2.1 | 1 | 6.A.2.1 | 2 | 6.A.2.1 | 2 | 6.A.2.1 | 1 | 6.A.2.1 | 1 | 6.A.2.1 | 1 | 6.A.2.1 |
| 60 | 1 | 6.G.2.1 |
| 61 | 1 | 6.G.1.1 | 1 | 6.G.1.1 | 2 | 6.G.1.1 | 1 | 6.G.1.1 | 1 | 6.G.1.1 | 1 | 6.G.1.1 | 2 | 6.G.1.1 |
| 62 | 2 | 6.M.1.2 | 2 | 6.M.1.2 | 2 | 6.M.1.2 | 2 | 6.M.1.2 | 1 | 6.M.1.2 | 2 | 6.M.1.2 | 2 | 6.M.1.2 |
| 63 | 2 | 6.A.1.2 | 2 | 6.A.1.2 | 2 | 6.A.1.2 | 2 | 6.A.1.2 | 1 | 6.A.1.2 | 2 | 6.A.1.1 | 1 | 6.A.2.1 |
| 64 | 1 | 6.N.2.1 |
| 65 | 2 | 6.S.2.1 | 2 | 6.S.2.1 | 1 | 6.S.2.1 | 2 | 6.S.2.1 | 2 | 6.S.2.1 | 1 | 6.S.2.1 | 2 | 6.S.2.1 |
| 66 | 1 | 6.M.1.1 | 2 | 6.M.1.1 | 1 | 6.M.1.1 | 2 | 6.M.1.1 | 1 | 6.M.1.1 | 2 | 6.M.1.1 | 1 | 6.M.1.1 |
| 67 | 1 | 6.A.3.1 |
| 68 | 2 | 6.M.1.1 | 2 | 6.M.1.1 | 1 | 6.M.1.1 | 1 | 6.M.1.1 | 1 | 6.M.1.1 | 2 | 6.M.1.1 | 2 | 6.M.1.1 |
| 69 | 2 | 6.G.2.1 | 2 | 6.G.2.1 | 2 | 6.G.2.1 | 2 | 6.G.2.1 | 1 | 6.G.2.1 | 2 | 6.G.2.1 | 1 | 6.G.2.1 |
| 70 | 2 | 6.S.2 | 2 | 6.S.2 | 1 | 6.S.2 | 1 | 6.S.2 | 2 | 6.S.2 | 1 | 6.S.2 | 1 | 6.S.2 |
| 71 | 2 | 6.A.1.2 | 1 | 6.A.1.1 | 1 | 6.A.1.2 |
| 72 | 1 | 6.N.2.1 | 1 | 6.N.2.1 | 1 | 6.N.2.1 | 1 | 6.N.2.1 | 2 | 6.N.2.1 | 1 | 6.N.2.1 | 1 | 6.N.2.1 |
| 73 | 2 | 6.A.4.1 | 2 | 6.A.4.1 | 2 | 6.A.4.1 | 2 | 6.A.4.1 | 1 | 6.A.4.1 | 2 | 6.A.4.1 | 1 | 6.A.4.1 |
| 74 | 2 | 6.G.1.1 | 2 | 6.G.1.2 | 1 | 6.G.1.2 | 2 | 6.G.1.2 | 1 | 6.G.1.1 | 2 | 6.G.1.2 | 1 | 6.G.1.2 |
| 75 | 1 | 6.G.1.2 |
| 76 | 1 | 6.N.3.1 | 1 | 6.N.2.1 |

Table 6.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 6

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 77 | 2 | 6.A.2.1 | 2 | 6.A.2.1 | 2 | 6.A.2.1 | 2 | 6.A.2.1 | 1 | 6.A.2.1 | 2 | 6.A.2.1 | 1 | 6.A.2.1 |
| 78 | 2 | 6.A.1.2 | 1 | 6.A.1.2 | 2 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.2.1 | 1 | 6.A.1.2 |
| 79 | 2 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 | 2 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 |
| 80 | 2 | 6.A.4.1 | 2 | 6.S.1.2 |
| 81 | | | | | | | | | | | | | | |
| 82 | | | | | | | | | | | | | | |
| 83 | 2 | 6.N.3.1 | 2 | 6.A.3.1 | 2 | 6.N.3.1 |
| 84 | 2 | 6.A.2.1 | 1 | 6.A.2.1 | 1 | 6.A.1.2 | 2 | 6.A.2.1 | 2 | 6.A.1.2 | 2 | 6.A.2.1 | 1 | 6.A.2.1 |
| 85 | 2 | 6.A.4.1 | 2 | 6.A.4.1 | 2 | 6.A.4.1 | 1 | 6.A.4.1 | 2 | 6.A.4.1 | 2 | 6.A.4.1 | 1 | 6.A.4.1 |
| 86 | 1 | 6.M.1.2 | 2 | 6.M.1.2 |
| 87 | 1 | 6.A.2.1 | 1 | 6.A.2.1 | 1 | 6.A.2.1 | 1 | 6.A.2.1 | 2 | 6.A.2.1 | 1 | 6.A.2.1 | 1 | 6.A.2.1 |
| 88 | 2 | 6.S.2.1 | 2 | 6.S.2.1 | 1 | 6.S.2.1 | 2 | 6.S.2.1 | 1 | 6.S.2.1 | 1 | 6.S.2.1 | 1 | 6.S.2.1 |
| 89 | 1 | 6.A.3.1 |
| 90 | 1 | 6.N.2.1 |
| 91 | 1 | 6.A.4.1 | 1 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.1.2 | 1 | 6.A.2.1 | 1 | 6.A.1.2 |
| 92 | 2 | 6.S.2 | 2 | 6.S.2.1 | 1 | 6.S.2 | 1 | 6.S.2 | 1 | 6.S.2 | 1 | 6.S.2 | 1 | 6.S.2.1 |

Objective Pairwise Comparison: 0.9127
Standard Pairwise Comparison: 0.9864

Table 6.9
 Objectives Coded to Each Item by Reviewers
 South Dakota Mathematics 2008 Grade 6

| Low | | Medium | | High |
|-----|--|----------|--|------|
| 0 | | 6.391304 | | 7 |

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 1 2177242 | 6.G.2 |
| 2 3530923 | 6.M.1.2 |
| 3 2177296 | 6.A.3.1 | 6.A.4.1 | 6.A.4.1 | 6.A.4.1 | 6.A.4.1 | 6.A.4.1 | 6.A.4.1 |
| 4 3530908 | 6.S.2.1 |
| 5 3528464 | 6.A.1.1 |
| 6 3530238 | 6.A.2.1 |
| 7 3328411 | 6.G.1.1 | 6.G.1.1 | 6.G.1.1 | 6.G.1.1 | 6.G.1.1 | 6.G.2.1 | 6.G.2.1 |
| 8 3531025 | 6.N.1.2 |
| 9 3327623 | 6.A.1.1 |
| 10 3328413 | 6.G.1.1 | 6.G.1.1 | 6.G.1.1 | 6.G.1.1 | 6.G.1.1 | 6.G.2.1 | 6.G.2.1 |
| 11 2177244 | 6.M.1.1 |
| 12 2177279 | 6.N.1.1 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 3430175 | 6.N.3.1 |
| 17 3532841 | 6.S.1.2 |
| 18 3530275 | 6.A.1.2 |
| 19 3351221 | 6.G.1.1 |
| 20 3529876 | 6.A.4.1 |
| 21 3530445 | 6.N.1.2 |
| 22 2177282 | 6.N.1.1 |
| 23 2177273 | 6.N.3.1 |
| 24 2177218 | 6.S.1.2 |
| 25 3430176 | 6.S.2.1 |
| 26 2177274 | 6.A.3.2 |
| 27 3529885 | 6.G.2.1 |
| 28 3532368 | 6.N.1.2 |
| 29 3328425 | 6.S.1.2 | 6.S.1.2 | 6.S.1.2 | 6.S.1.2 | 6.S.1.2 | 6.S.1.2 | 6.S.2.1 |
| 30 3532470 | 6.N.2 |
| 31 3344802 | 6.A.1.1 | 6.A.1.1 | 6.A.1.1 | 6.A.1.1 | 6.A.1.1 | 6.A.1.2 | 6.A.1.2 |
| 32 2177289 | 6.A.3.2 |
| 33 2345788 | 6.A.3.2 |
| 34 2177201 | 6.S.1.2 |
| 35 3532311 | 6.G.1.1 |
| 36 2345792 | 6.A.3.2 |
| 37 3345094 | 6.S.1.1 |
| 38 3530838 | 6.N.2.1 | 6.N.3.1 | 6.N.3.1 | 6.N.3.1 | 6.N.3.1 | 6.N.3.1 | 6.N.3.1 |

Table 6.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 6

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 39 3327654 | 6.A.1.2 |
| 40 | | | | | | | |
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 3328422 | 6.N.2.1 |
| 44 3530839 | 6.A.3.2 | 6.A.3.2 | 6.A.3.2 | 6.A.3.2 | 6.A.3.2 | 6.A.3.2 | 6.N.1.2 |
| 45 3344810 | 6.A.2.1 |
| 46 2177240 | 6.G.1.1 | 6.G.2.1 | 6.G.2.1 | 6.G.2.1 | 6.G.2.1 | 6.G.2.1 | 6.G.2.1 |
| 47 3430172 | 6.A.4.1 |
| 48 3344807 | 6.A.1.2 |
| 49 2177229 | 6.G.1.2 |
| 50 2177251 | 6.M.1.1 |
| 51 3531029 | 6.M.1.2 | 6.N.1.2 | 6.N.1.2 | 6.N.1.2 | 6.N.1.2 | 6.N.1.2 | 6.N.1.2 |
| 52 3328423 | 6.S.1.1 |
| 53 3344918 | 6.A.3.2 |
| 54 2177224 | 6.A.3.2 |
| 55 3328404 | 6.G.1.1 | 6.G.1.1 | 6.G.1.1 | 6.G.1.1 | 6.G.1.1 | 6.G.1.1 | 6.G.1.2 |
| 56 2177222 | 6.A.3.2 |
| 57 3355986 | 6.S.2.1 |
| 58 3532459 | 6.N.2 |
| 59 3327675 | 6.A.2.1 |
| 60 3529883 | 6.G.2.1 |
| 61 2177230 | 6.G.1.1 |
| 62 2345790 | 6.M.1.2 |
| 63 3345075 | 6.A.1.1 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.2.1 |
| 64 3344841 | 6.N.2.1 |
| 65 3328426 | 6.S.2.1 |
| 66 3529887 | 6.M.1.1 |
| 67 2177214 | 6.A.3.1 |
| 68 3530885 | 6.M.1.1 |
| 69 3532347 | 6.G.2.1 |
| 70 3535467 | 6.S.2 |
| 71 3540836 | 6.A.1.1 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 |
| 72 3530453 | 6.N.2.1 |
| 73 3530264 | 6.A.4.1 |
| 74 3328408 | 6.G.1.1 | 6.G.1.1 | 6.G.1.2 | 6.G.1.2 | 6.G.1.2 | 6.G.1.2 | 6.G.1.2 |
| 75 3328409 | 6.G.1.2 |
| 76 3344834 | 6.N.2.1 | 6.N.2.1 | 6.N.2.1 | 6.N.2.1 | 6.N.2.1 | 6.N.2.1 | 6.N.3.1 |
| 77 3327662 | 6.A.2.1 |
| 78 3529893 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.2.1 |
| 79 3430173 | 6.A.1.2 |
| 80 3532480 | 6.A.4.1 | 6.S.1.2 | 6.S.1.2 | 6.S.1.2 | 6.S.1.2 | 6.S.1.2 | 6.S.1.2 |

Table 6.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 6

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 3530888 | 6.A.3.1 | 6.N.3.1 | 6.N.3.1 | 6.N.3.1 | 6.N.3.1 | 6.N.3.1 | 6.N.3.1 |
| 84 3345077 | 6.A.1.2 | 6.A.1.2 | 6.A.2.1 | 6.A.2.1 | 6.A.2.1 | 6.A.2.1 | 6.A.2.1 |
| 85 2177293 | 6.A.4.1 |
| 86 2345791 | 6.M.1.2 |
| 87 3530222 | 6.A.2.1 |
| 88 3530905 | 6.S.2.1 |
| 89 2177217 | 6.A.3.1 |
| 90 3430174 | 6.N.2.1 |
| 91 3530219 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.1.2 | 6.A.2.1 | 6.A.4.1 |
| 92 3535778 | 6.S.2 | 6.S.2 | 6.S.2 | 6.S.2 | 6.S.2 | 6.S.2.1 | 6.S.2.1 |

Table 6.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 6

| | | | | |
|-----|--|----------|--|------|
| Low | | Medium | | High |
| 0 | | 16.33333 | | 55 |

| | | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| 6.A | | | | | | | | | | | | | | | | | | | | | |
| 6.A.1 | | | | | | | | | | | | | | | | | | | | | |
| 6.A.1.1 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 3 | 3 | 3 | 3 | 3 | 6 | |
| | | | | | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 3 | |
| | 7 | | | | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | | | | |
| 6.A.1.2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 1 | 1 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | |
| | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | |
| | 8 | 8 | 8 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 8 | 8 | 8 | 8 | | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | | | | | | |
| | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | | | | | | |
| 6.A.2 | | | | | | | | | | | | | | | | | | | | | |
| 6.A.2.1 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | |
| | | | | | | | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 9 | 9 | 9 | 9 | 9 | 9 | |
| | 5 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | |
| | 9 | 3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | | |
| | 8 | 8 | 8 | 9 | | | | | | | | | | | | | | | | | |
| | 7 | 7 | 7 | 1 | | | | | | | | | | | | | | | | | |
| 6.A.3 | | | | | | | | | | | | | | | | | | | | | |
| 6.A.3.1 | 3 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 3 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | | | |
| 6.A.3.2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | | |
| | 3 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | |
| | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | |
| 6.A.4 | | | | | | | | | | | | | | | | | | | | | |
| 6.A.4.1 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | | | | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 1 | | | | |
| 6.G | | | | | | | | | | | | | | | | | | | | | |
| 6.G.1 | | | | | | | | | | | | | | | | | | | | | |
| 6.G.1.1 | 7 | 7 | 7 | 7 | 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | |
| | | | | | | 0 | 0 | 0 | 0 | 0 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 5 | 5 | 5 | |
| | 3 | 3 | 3 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | | |
| | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | | |

Table 6.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 6

| | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7 | | | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | | | |
| 6.G.1.2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| 6.G.2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | |
| 6.G.2.1 | 7 | 7 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 |
| | | | 0 | 0 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 0 | 0 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | | |
| | 0 | 0 | 0 | 0 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | | | | | | |
| 6.M | | | | | | | | | | | | | | | | | | | |
| 6.M.1 | | | | | | | | | | | | | | | | | | | |
| 6.M.1.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 6 | 6 | 6 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | | | | | |
| | 6 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | |
| 6.M.1.2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 |
| | | | | | | | | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | 6 | 6 |
| | 8 | 8 | | | | | | | | | | | | | | | | | |
| | 6 | 6 | | | | | | | | | | | | | | | | | |
| 6.N | | | | | | | | | | | | | | | | | | | |
| 6.N.1 | | | | | | | | | | | | | | | | | | | |
| 6.N.1.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | |
| 6.N.1.2 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 8 | 8 | 8 | 8 |
| | 2 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | | | | |
| | 8 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | |
| 6.N.2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | |
| 6.N.2.1 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 |
| | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 2 |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | | | | |
| | 2 | 2 | 6 | 6 | 6 | 6 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 6.N.3 | | | | | | | | | | | | | | | | | | | |
| 6.N.3.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 8 | 8 | 8 | 8 | 8 |
| | 7 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | |
| | 6 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| 6.S | | | | | | | | | | | | | | | | | | | |
| 6.S.1 | | | | | | | | | | | | | | | | | | | |
| 6.S.1.1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | |

Table 6.10
Items Coded by Reviewers to Each Objective
South Dakota Mathematics 2008 Grade 6

| | | | | | | | | | | | | | | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 6.S.1.2 | 1 7 | 2 4 | 2 9 | 2 9 | 2 9 | 2 9 | 2 9 | 2 9 | |
| | 3 4 | 8 0 | 8 0 | 8 0 | 8 0 | 8 0 | 8 0 | | | | | | | | |
| 6.S.2 | 7 0 | 9 2 | 9 2 | 9 2 | 9 2 | 9 2 | | | | | | | | | |
| 6.S.2.1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 5 | 2 9 | 2 7 | 5 7 | 5 7 | 5 7 | 5 7 | 5 7 |
| | 5 7 | 5 7 | 6 5 | 8 8 | 9 2 | 9 2 | | | |

Table 6.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 6

| Low | | Medium | | High | | | | | | |
|---------|------|--------|------|------|------|------|------|------|------|------|
| 1 | | 3 | | 7 | | | | | | |
| 6.A | | | | | | | | | | |
| 6.A.1 | | | | | | | | | | |
| 6.A.1.1 | 5:7 | 9:7 | 31:5 | 63:1 | 71:1 | | | | | |
| 6.A.1.2 | 18:7 | 31:2 | 39:7 | 48:7 | 63:5 | 71:6 | 78:6 | 79:7 | 84:2 | 91:5 |
| 6.A.2 | | | | | | | | | | |
| 6.A.2.1 | 6:7 | 45:7 | 59:7 | 63:1 | 77:7 | 78:1 | 84:5 | 87:7 | 91:1 | |
| 6.A.3 | | | | | | | | | | |
| 6.A.3.1 | 3:1 | 67:7 | 83:1 | 89:7 | | | | | | |
| 6.A.3.2 | 26:7 | 32:7 | 33:7 | 36:7 | 44:6 | 53:7 | 54:7 | 56:7 | | |
| 6.A.4 | | | | | | | | | | |
| 6.A.4.1 | 3:6 | 20:7 | 47:7 | 73:7 | 80:1 | 85:7 | 91:1 | | | |
| 6.G | | | | | | | | | | |
| 6.G.1 | | | | | | | | | | |
| 6.G.1.1 | 7:5 | 10:5 | 19:7 | 35:7 | 46:1 | 55:6 | 61:7 | 74:2 | | |
| 6.G.1.2 | 49:7 | 55:1 | 74:5 | 75:7 | | | | | | |
| 6.G.2 | 1:7 | | | | | | | | | |
| 6.G.2.1 | 7:2 | 10:2 | 27:7 | 46:6 | 60:7 | 69:7 | | | | |
| 6.M | | | | | | | | | | |
| 6.M.1 | | | | | | | | | | |
| 6.M.1.1 | 11:7 | 50:7 | 66:7 | 68:7 | | | | | | |
| 6.M.1.2 | 2:7 | 51:1 | 62:7 | 86:7 | | | | | | |
| 6.N | | | | | | | | | | |
| 6.N.1 | | | | | | | | | | |
| 6.N.1.1 | 12:7 | 22:7 | | | | | | | | |
| 6.N.1.2 | 8:7 | 21:7 | 28:7 | 44:1 | 51:6 | | | | | |
| 6.N.2 | 30:7 | 58:7 | | | | | | | | |
| 6.N.2.1 | 38:1 | 43:7 | 64:7 | 72:7 | 76:6 | 90:7 | | | | |
| 6.N.3 | | | | | | | | | | |
| 6.N.3.1 | 16:7 | 23:7 | 38:6 | 76:1 | 83:6 | | | | | |
| 6.S | | | | | | | | | | |
| 6.S.1 | | | | | | | | | | |
| 6.S.1.1 | 37:7 | 52:7 | | | | | | | | |
| 6.S.1.2 | 17:7 | 24:7 | 29:6 | 34:7 | 80:6 | | | | | |
| 6.S.2 | 70:7 | 92:5 | | | | | | | | |
| 6.S.2.1 | 4:7 | 25:7 | 29:1 | 57:7 | 65:7 | 88:7 | 92:2 | | | |

Table 6.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 6

| Low | | Medium | | High |
|-----|--|--------|--|------|
| 1 | | 3 | | 7 |

| | | | |
|------------|-----------|-----------|--|
| 1 2177242 | 6.G.2:7 | | |
| 2 3530923 | 6.M.1.2:7 | | |
| 3 2177296 | 6.A.3.1:1 | 6.A.4.1:6 | |
| 4 3530908 | 6.S.2.1:7 | | |
| 5 3528464 | 6.A.1.1:7 | | |
| 6 3530238 | 6.A.2.1:7 | | |
| 7 3328411 | 6.G.1.1:5 | 6.G.2.1:2 | |
| 8 3531025 | 6.N.1.2:7 | | |
| 9 3327623 | 6.A.1.1:7 | | |
| 10 3328413 | 6.G.1.1:5 | 6.G.2.1:2 | |
| 11 2177244 | 6.M.1.1:7 | | |
| 12 2177279 | 6.N.1.1:7 | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 3430175 | 6.N.3.1:7 | | |
| 17 3532841 | 6.S.1.2:7 | | |
| 18 3530275 | 6.A.1.2:7 | | |
| 19 3351221 | 6.G.1.1:7 | | |
| 20 3529876 | 6.A.4.1:7 | | |
| 21 3530445 | 6.N.1.2:7 | | |
| 22 2177282 | 6.N.1.1:7 | | |
| 23 2177273 | 6.N.3.1:7 | | |
| 24 2177218 | 6.S.1.2:7 | | |
| 25 3430176 | 6.S.2.1:7 | | |
| 26 2177274 | 6.A.3.2:7 | | |
| 27 3529885 | 6.G.2.1:7 | | |
| 28 3532368 | 6.N.1.2:7 | | |
| 29 3328425 | 6.S.1.2:6 | 6.S.2.1:1 | |
| 30 3532470 | 6.N.2:7 | | |
| 31 3344802 | 6.A.1.1:5 | 6.A.1.2:2 | |
| 32 2177289 | 6.A.3.2:7 | | |
| 33 2345788 | 6.A.3.2:7 | | |
| 34 2177201 | 6.S.1.2:7 | | |
| 35 3532311 | 6.G.1.1:7 | | |
| 36 2345792 | 6.A.3.2:7 | | |
| 37 3345094 | 6.S.1.1:7 | | |
| 38 3530838 | 6.N.2.1:1 | 6.N.3.1:6 | |

Table 6.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 6

| | | | |
|------------|-----------|-----------|-----------|
| 39 3327654 | 6.A.1.2:7 | | |
| 40 | | | |
| 41 | | | |
| 42 | | | |
| 43 3328422 | 6.N.2.1:7 | | |
| 44 3530839 | 6.A.3.2:6 | 6.N.1.2:1 | |
| 45 3344810 | 6.A.2.1:7 | | |
| 46 2177240 | 6.G.1.1:1 | 6.G.2.1:6 | |
| 47 3430172 | 6.A.4.1:7 | | |
| 48 3344807 | 6.A.1.2:7 | | |
| 49 2177229 | 6.G.1.2:7 | | |
| 50 2177251 | 6.M.1.1:7 | | |
| 51 3531029 | 6.M.1.2:1 | 6.N.1.2:6 | |
| 52 3328423 | 6.S.1.1:7 | | |
| 53 3344918 | 6.A.3.2:7 | | |
| 54 2177224 | 6.A.3.2:7 | | |
| 55 3328404 | 6.G.1.1:6 | 6.G.1.2:1 | |
| 56 2177222 | 6.A.3.2:7 | | |
| 57 3355986 | 6.S.2.1:7 | | |
| 58 3532459 | 6.N.2:7 | | |
| 59 3327675 | 6.A.2.1:7 | | |
| 60 3529883 | 6.G.2.1:7 | | |
| 61 2177230 | 6.G.1.1:7 | | |
| 62 2345790 | 6.M.1.2:7 | | |
| 63 3345075 | 6.A.1.1:1 | 6.A.1.2:5 | 6.A.2.1:1 |
| 64 3344841 | 6.N.2.1:7 | | |
| 65 3328426 | 6.S.2.1:7 | | |
| 66 3529887 | 6.M.1.1:7 | | |
| 67 2177214 | 6.A.3.1:7 | | |
| 68 3530885 | 6.M.1.1:7 | | |
| 69 3532347 | 6.G.2.1:7 | | |
| 70 3535467 | 6.S.2:7 | | |
| 71 3540836 | 6.A.1.1:1 | 6.A.1.2:6 | |
| 72 3530453 | 6.N.2.1:7 | | |
| 73 3530264 | 6.A.4.1:7 | | |
| 74 3328408 | 6.G.1.1:2 | 6.G.1.2:5 | |
| 75 3328409 | 6.G.1.2:7 | | |
| 76 3344834 | 6.N.2.1:6 | 6.N.3.1:1 | |
| 77 3327662 | 6.A.2.1:7 | | |
| 78 3529893 | 6.A.1.2:6 | 6.A.2.1:1 | |
| 79 3430173 | 6.A.1.2:7 | | |
| 80 3532480 | 6.A.4.1:1 | 6.S.1.2:6 | |

Table 6.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
South Dakota Mathematics 2008 Grade 6

| | | | |
|------------|-----------|-----------|-----------|
| 81 | | | |
| 82 | | | |
| 83 3530888 | 6.A.3.1:1 | 6.N.3.1:6 | |
| 84 3345077 | 6.A.1.2:2 | 6.A.2.1:5 | |
| 85 2177293 | 6.A.4.1:7 | | |
| 86 2345791 | 6.M.1.2:7 | | |
| 87 3530222 | 6.A.2.1:7 | | |
| 88 3530905 | 6.S.2.1:7 | | |
| 89 2177217 | 6.A.3.1:7 | | |
| 90 3430174 | 6.N.2.1:7 | | |
| 91 3530219 | 6.A.1.2:5 | 6.A.2.1:1 | 6.A.4.1:1 |
| 92 3535778 | 6.S.2:5 | 6.S.2.1:2 | |

Table 6.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 6

| Low DOK | | Matched DOK | | High DOK |
|---------|--|-------------|--|----------|
| 1 | | 3 | | 7 |

| | | | | | | | | | | |
|---------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------|-------------|
| 6.A [2]: | | | | | | | | | | |
| 6.A. 1 [2]: | | | | | | | | | | |
| 6.A. 1.1 [1]: | 5:7[1.29] | 9:7[1.14] | 31:5 [1.6] | 63:1 [2] | 71:1 [1] | | | | | |
| 6.A. 1.2 [2]: | 18:7 [2] | 31:2 [1.5] | 39:7 [1.2 9] | 48:7 [1.2 9] | 63:5 [1.8] | 71:6 [1.1 7] | 78:6 [1.3 3] | 79:7 [1.2 9] | 84:2 [1.5] | 91:5 [1] |
| 6.A. 2 [2]: | | | | | | | | | | |
| 6.A. 2.1 [2]: | 6:7[1.29] | 45:7 [1.2 9] | 59:7 [1.4 3] | 63:1 [1] | 77:7 [1.7 1] | 78:1 [1] | 84:5 [1.6] | 87:7 [1.1 4] | 91:1 [1] | |
| 6.A. 3 [1]: | | | | | | | | | | |
| 6.A. 3.1 [1]: | 3:1[2] | 67:7 [1] | 83:1 [2] | 89:7 [1] | | | | | | |
| 6.A. 3.2 [1]: | 26:7 [1] | 32:7 [1] | 33:7 [2] | 36:7 [1] | 44:6 [1] | 53:7 [1] | 54:7 [2] | 56:7 [1] | | |
| 6.A. 4 [2]: | | | | | | | | | | |
| 6.A. 4.1 [2]: | 3:6[1.67] | 20:7 [2] | 47:7 [1.2 9] | 73:7 [1.7 1] | 80:1 [2] | 85:7 [1.7 1] | 91:1 [1] | | | |
| 6.G [2]: | | | | | | | | | | |
| 6.G. 1 [2]: | | | | | | | | | | |
| 6.G. | 7:5[| 10:5 | 19:7 | 35:7 | 46:1 | 55:6 | 61:7 | 74:2 | | |

Table 6.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 6

| | | | | | | | | |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|------------|-------|
| 1.1 [2]: | 1.4] | [1.8] | [1] | [2] | [1] | [1.1 7] | [1.2 9] | [1.5] |
| 6.G. 1.2 [1]: | 49:7 [1.4 3] | 55:1 [1] | 74:5 [1.6] | 75:7 [1] | | | | |
| 6.G. 2 [2]: | 1:7[1] | | | | | | | |
| 6.G. 2.1 [2]: | 7:2[2] | 10:2 [1.5] | 27:7 [1.4 3] | 46:6 [1] | 60:7 [1] | 69:7 [1.7 1] | | |
| 6.M [1]: | | | | | | | | |
| 6.M. 1 [1]: | | | | | | | | |
| 6.M. 1.1 [1]: | 11:7 [1] | 50:7 [1] | 66:7 [1.4 3] | 68:7 [1.5 7] | | | | |
| 6.M. 1.2 [1]: | 2:7[1.14] | 51:1 [2] | 62:7 [1.8 6] | 86:7 [1.8 6] | | | | |
| 6.N [1]: | | | | | | | | |
| 6.N. 1 [1]: | | | | | | | | |
| 6.N. 1.1 [1]: | 12:7 [1] | 22:7 [1.5 7] | | | | | | |
| 6.N. 1.2 [1]: | 8:7[1] | 21:7 [1] | 28:7 [1.1 4] | 44:1 [2] | 51:6 [1.8 3] | | | |
| 6.N. 2 [1]: | 30:7 [1] | 58:7 [1] | | | | | | |
| 6.N. 2.1 [1]: | 38:1 [1] | 43:7 [1] | 64:7 [1] | 72:7 [1.1 4] | 76:6 [1] | 90:7 [1] | | |
| 6.N. 3 [2]: | | | | | | | | |
| 6.N. | 16:7 | 23:7 | 38:6 | 76:1 | 83:6 | | | |

Table 6.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 6

| | | | | | | | | | |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------|--|--|
| 3.1 [2]: | [2] | [2.1 4] | [2] | [1] | [2] | | | | |
| 6.S [1]: | | | | | | | | | |
| 6.S. 1 [3]: | | | | | | | | | |
| 6.S. 1.1 [1]: | 37:7 [1] | 52:7 [1.1 4] | | | | | | | |
| 6.S. 1.2 [3]: | 17:7 [1.8 6] | 24:7 [1.8 6] | 29:6 [1.1 7] | 34:7 [1.8 6] | 80:6 [2] | | | | |
| 6.S. 2 [1]: | 70:7 [1.4 3] | 92:5 [1.2] | | | | | | | |
| 6.S. 2.1 [1]: | 4:7 1.86] | 25:7 [1.4 3] | 29:1 [1] | 57:7 [1.4 3] | 65:7 [1.7 1] | 88:7 [1.4 3] | 92:2 [1.5] | | |

Table 7.1
Categorical Concurrence Between Standards and Assessment as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 7
Number of Assessment Items - 84

| Standards | | | Level by Objective | | | Hits | | Cat. Concurr. |
|----------------------------------|---------|--------|--------------------|--------------------|---------------------|-------|------|---------------|
| Title | Goals # | Objs # | Level | # of objs by Level | % w/in std by Level | Mean | S.D. | |
| 7.A - ALGEBRA | 4 | 6.14 | 1 2 | 2 4 | 33 66 | 27 | 0.76 | YES |
| 7.G - GEOMETRY | 2 | 3.86 | 1 2 | 2 1 | 66 33 | 14.57 | 1.50 | YES |
| 7.M - MEASUREMENT | 1 | 2 | 1 | 2 | 100 | 6.43 | 1.05 | YES |
| 7.N - NUMBER SENSE | 3 | 4.14 | 1 2 | 2 2 | 50 50 | 21.14 | 0.64 | YES |
| 7.S - STATISTICS AND PROBABILITY | 2 | 3 | 1 2 | 2 1 | 66 33 | 14.86 | 0.35 | YES |
| Total | 12 | 19.14 | 1 2 | 10 8 | 55 44 | 84 | 0 | |

Table 7.2a

Alternate Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Seven Reviewers (Does Not Assume Each Objective Should Have Equal Representation)

South Dakota Mathematics 2008 Grade 7

Number of Assessment Items - 84

| Standards | | | Hits | | Level of Item w.r.t. Standard | | | | | | DOK Consistency |
|----------------------------------|---------|--------|-------|------|-------------------------------|------|------|------|---------|------|-----------------|
| | | | | | % Under | | % At | | % Above | | |
| Title | Goals # | Objs # | M | S.D. | M | S.D. | M | S.D. | M | S.D. | |
| 7.A - ALGEBRA | 4 | 6.14 | 27 | 0.76 | 48 | 262 | 51 | 36 | 1 | 6 | YES |
| 7.G - GEOMETRY | 2 | 3.86 | 14.57 | 1.50 | 19 | 160 | 63 | 40 | 19 | 46 | YES |
| 7.M - MEASUREMENT | 1 | 2 | 6.43 | 1.05 | 0 | 0 | 75 | 26 | 25 | 26 | YES |
| 7.N - NUMBER SENSE | 3 | 4.14 | 21.14 | 0.64 | 13 | 135 | 62 | 30 | 25 | 26 | YES |
| 7.S - STATISTICS AND PROBABILITY | 2 | 3 | 14.86 | 0.35 | 3 | 37 | 70 | 28 | 27 | 30 | YES |
| Total | 12 | 19.14 | 84 | 0 | 19 | 31 | 60 | 35 | 21 | 32 | |

Table 7.3

Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Seven Reviewers

South Dakota Mathematics 2008 Grade 7

Number of Assessment Items - 84

| Standards | | | Hits | | Range of Objectives | | | | Rng. of Know. | Balance Index | | | | Bal. of Represent. |
|----------------------------------|---------|--------|-------|------|---------------------|------|------------|------|---------------|------------------------|------|-------|------|--------------------|
| | | | | | # Objs Hit | | % of Total | | | % Hits in Std/Ttl Hits | | Index | | |
| Title | Goals # | Objs # | Mean | S.D. | Mean | S.D. | Mean | S.D. | | Mean | S.D. | Mean | S.D. | |
| 7.A - ALGEBRA | 4 | 6.14 | 27 | 0.76 | 6.14 | 0.35 | 100 | 0 | YES | 32 | 1 | 0.81 | 0.04 | YES |
| 7.G - GEOMETRY | 2 | 3.86 | 14.57 | 1.50 | 3.86 | 0.35 | 100 | 0 | YES | 17 | 2 | 0.65 | 0.04 | WEAK |
| 7.M - MEASUREMENT | 1 | 2 | 6.43 | 1.05 | 2 | 0 | 100 | 0 | YES | 8 | 1 | 0.98 | 0.06 | YES |
| 7.N - NUMBER SENSE | 3 | 4.14 | 21.14 | 0.64 | 4.14 | 0.35 | 100 | 0 | YES | 25 | 1 | 0.81 | 0.07 | YES |
| 7.S - STATISTICS AND PROBABILITY | 2 | 3 | 14.86 | 0.35 | 3 | 0 | 100 | 0 | YES | 18 | 0 | 0.87 | 0.04 | YES |
| Total | 12 | 19.14 | 84 | 0 | 3.83 | 1.40 | 100 | 0 | | 20 | 8 | 0.82 | 0.12 | |

Table 7.4

Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 7
Number of Assessment Items - 84

| Standards | Alignment Criteria | | | |
|----------------------------------|-------------------------|--------------------------------|--------------------|---------------------------|
| | Categorical Concurrence | Depth-of-Knowledge Consistency | Range of Knowledge | Balance of Representation |
| 7.A - ALGEBRA | YES | YES | YES | YES |
| 7.G - GEOMETRY | YES | YES | YES | WEAK |
| 7.M - MEASUREMENT | YES | YES | YES | YES |
| 7.N - NUMBER SENSE | YES | YES | YES | YES |
| 7.S - STATISTICS AND PROBABILITY | YES | YES | YES | YES |

Table 7.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 7

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 3 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| 4 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 6 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | 2 | 2 | 2 | 1 | 2 | 1 | 1 |
| 9 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 10 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 11 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 12 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 17 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 18 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 19 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 20 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 21 | 2 | 1 | 2 | 1 | 1 | 1 | 2 |
| 22 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| 23 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 24 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 25 | 2 | 1 | 2 | 2 | 2 | 2 | 1 |
| 26 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 27 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| 28 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 29 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 30 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 31 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 32 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 33 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 34 | 2 | 1 | 1 | 1 | 2 | 1 | 1 |
| 35 | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| 36 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 37 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 38 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 39 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 40 | | | | | | | |

Table 7.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 7

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 44 | 1 | 1 | 1 | 2 | 2 | 2 | 1 |
| 45 | 1 | 1 | 1 | 1 | 2 | 1 | 2 |
| 46 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 47 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 48 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 49 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 50 | 2 | 1 | 2 | 1 | 1 | 1 | 1 |
| 51 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| 52 | 2 | 2 | 1 | 2 | 2 | 3 | 2 |
| 53 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 54 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 55 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 56 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 57 | 1 | 2 | 2 | 2 | 2 | 2 | 1 |
| 58 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 59 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 60 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 61 | 2 | 2 | 2 | 1 | 2 | 1 | 2 |
| 62 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 63 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| 64 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| 65 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 66 | 2 | 2 | 2 | 1 | 2 | 2 | 1 |
| 67 | 1 | 1 | 1 | 2 | 1 | 2 | 1 |
| 68 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 69 | 2 | 1 | 1 | 2 | 2 | 1 | 2 |
| 70 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 71 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 72 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 73 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 74 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 75 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| 76 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 77 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 78 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| 79 | 1 | 2 | 1 | 2 | 2 | 1 | 1 |
| 80 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |

Table 7.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 7

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 84 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| 85 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 86 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| 87 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 88 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 89 | 2 | 2 | 1 | 1 | 1 | 1 | 2 |
| 90 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 91 | 1 | 2 | 2 | 2 | 2 | 1 | 2 |
| 92 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

Intraclass Correlation: 0.8959

Pairwise Comparison: 0.7715

Table 7.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 7

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 1 | 1 | 7.M.1.1 |
| 2 | 2 | 7.S.2.1 |
| 3 | 2 | 7.G.2.1 | 1 | 7.G.2.1 | 2 | 7.G.2.1 | 1 | 7.G.2.1 | 2 | 7.G.2.1 | 1 | 7.G.2.1 | 1 | 7.G.2.1 |
| 4 | 2 | 7.A.4.1 | 1 | 7.A.4.1 | 2 | 7.A.4.1 |
| 5 | 1 | 7.A.1.2 |
| 6 | 2 | 7.A.4.1 | 2 | 7.A.4.1 | 1 | 7.A.4.1 | 1 | 7.A.4.1 | 2 | 7.A.4.1 | 1 | 7.A.4.1 | 1 | 7.A.4.1 |
| 7 | 1 | 7.G.1.1 |
| 8 | 2 | 7.N.1.1 | 2 | 7.N.1.1 | 2 | 7.N.1.1 | 1 | 7.N.1.1 | 2 | 7.N.1.1 | 1 | 7.N.1.1 | 1 | 7.N.1.1 |
| 9 | 2 | 7.A.3.2 | 2 | 7.A.3.2 | 2 | 7.N.3.1 | 2 | 7.A.3.2 | 2 | 7.A.3.2 | 2 | 7.N.3.1 | 1 | 7.A.3.2 |
| 10 | 2 | 7.A.4.1 |
| 11 | 2 | 7.N.1.2 |
| 12 | 2 | 7.A.1.1 | 2 | 7.A.1.1 | 2 | 7.A.1 | 2 | 7.A.1.1 | 2 | 7.A.1.1 | 2 | 7.A.1.1 | 2 | 7.A.1.1 |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | 2 | 7.S.1.2 |
| 17 | 2 | 7.S.2.1 | 2 | 7.S.2.1 | 1 | 7.S.2.1 | 1 | 7.S.2.1 | 1 | 7.S.2.1 | 1 | 7.S.1.2 | 1 | 7.S.2.1 |
| 18 | 1 | 7.G.1.1 |
| 19 | 1 | 7.M.1.1 |
| 20 | 1 | 7.A.1.1 |
| 21 | 2 | 7.N.1.1 | 1 | 7.N.1.1 | 2 | 7.N.1.1 | 1 | 7.N.1.1 | 1 | 7.N.1.1 | 1 | 7.N.1.1 | 2 | 7.N.1.1 |
| 22 | 2 | 7.N.3.1 | 1 | 7.N.1.1 | 2 | 7.N.1.1 | 2 | 7.N.2.1 | 1 | 7.N.1.1 | 2 | 7.N.1.1 | 2 | 7.N.1.1 |
| 23 | 1 | 7.A.2.1 | 1 | 7.A.1.1 |
| 24 | 2 | 7.N.3.1 | 2 | 7.N.2.1 | 2 | 7.N.3.1 | 2 | 7.N.3.1 | 2 | 7.N.3.1 | 2 | 7.N.2.1 | 2 | 7.N.3.1 |
| 25 | 2 | 7.A.3.2 | 1 | 7.A.3.2 | 2 | 7.A.3.2 | 2 | 7.A.3.2 | 2 | 7.A.3.2 | 2 | 7.A.3.2 | 1 | 7.A.3.2 |
| 26 | 1 | 7.N.2.1 |
| 27 | 1 | 7.N.1.2 | 2 | 7.N.1.2 | 1 | 7.N.1.2 | 1 | 7.N.1.2 | 2 | 7.N.1.2 | 1 | 7.N.2.1 | 1 | 7.N.1.2 |
| 28 | 1 | 7.S.1.1 | 2 | 7.S.1.1 | 1 | 7.S.1.1 |
| 29 | 2 | 7.S.1.2 |
| 30 | 2 | 7.G.1 | 2 | 7.G.1.1 |
| 31 | 1 | 7.N.1.1 |
| 32 | 1 | 7.A.3.1 |
| 33 | 2 | 7.S.2.1 | 2 | 7.S.2.1 | 1 | 7.S.2.1 |
| 34 | 2 | 7.A.2.1 | 1 | 7.A.2.1 | 1 | 7.A.2.1 | 1 | 7.A.2.1 | 2 | 7.A.2.1 | 1 | 7.A.2.1 | 1 | 7.A.2.1 |
| 35 | 1 | 7.G.1.1 | 1 | 7.G.1.1 | 1 | 7.G.1.1 | 2 | 7.G.1.1 | 1 | 7.G.1.1 | 2 | 7.G.1.1 | 1 | 7.G.1.1 |
| 36 | 1 | 7.A.1.1 |
| 37 | 1 | 7.A.3.1 |
| 38 | 1 | 7.A.3.2 |

Table 7.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 7

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 39 | 2 | 7.N.3.1 | 2 | 7.N.2.1 | 2 | 7.N.3.1 | 2 | 7.N.3.1 | 2 | 7.N.2.1 | 2 | 7.N.2.1 | 2 | 7.N.2.1 |
| 40 | | | | | | | | | | | | | | |
| 41 | | | | | | | | | | | | | | |
| 42 | | | | | | | | | | | | | | |
| 43 | 1 | 7.M.1.1 |
| 44 | 1 | 7.N.2.1 | 1 | 7.N.2.1 | 1 | 7.N.2.1 | 2 | 7.N.2.1 | 2 | 7.N.2.1 | 2 | 7.N.2.1 | 1 | 7.N.2.1 |
| 45 | 1 | 7.A.1.1 | 1 | 7.A.1.1 | 1 | 7.A.1.1 | 1 | 7.A.1.1 | 2 | 7.A.1.1 | 1 | 7.A.1.1 | 2 | 7.A.1.1 |
| 46 | 1 | 7.N.2.1 | 1 | 7.N.2.1 | 1 | 7.N.2.1 | 1 | 7.N.2.1 | 2 | 7.N.2.1 | 1 | 7.N.2.1 | 1 | 7.N.2.1 |
| 47 | 1 | 7.A.4.1 | 1 | 7.A.4.1 | 1 | 7.A.4.1 | 2 | 7.A.4.1 | 1 | 7.A.4.1 | 1 | 7.A.4.1 | 1 | 7.A.4.1 |
| 48 | 1 | 7.S.1.1 |
| 49 | 1 | 7.A.2.1 |
| 50 | 2 | 7.G.2.1 | 1 | 7.G.2.1 | 2 | 7.G.2.1 | 1 | 7.G.2.1 | 1 | 7.G.2.1 | 1 | 7.G.2.1 | 1 | 7.G.2.1 |
| 51 | 2 | 7.S.2.1 | 2 | 7.S.2.1 | 1 | 7.S.2.1 | 1 | 7.S.2.1 | 2 | 7.S.2.1 | 1 | 7.S.2.1 | 1 | 7.S.2.1 |
| 52 | 2 | 7.S.1.1 | 2 | 7.S.1.1 | 1 | 7.S.1.1 | 2 | 7.S.1.1 | 2 | 7.S.1.1 | 3 | 7.S.1.1 | 2 | 7.S.1.1 |
| 53 | 1 | 7.A.2.1 |
| 54 | 1 | 7.M.1.2 |
| 55 | 1 | 7.G.1.1 | 2 | 7.G.1.1 | 2 | 7.G.1.1 | 2 | 7.G.1.1 | 2 | 7.M.1.1 | 2 | 7.G.1.1 | 2 | 7.G.1.1 |
| 56 | 2 | 7.N.3.1 | 2 | 7.N.2.1 | 2 | 7.N.3.1 |
| 57 | 1 | 7.G.2.1 | 2 | 7.G.2.1 | 1 | 7.G.2.1 |
| 58 | 2 | 7.S.1.2 |
| 59 | 1 | 7.A.1.2 |
| 60 | 1 | 7.G.1.1 |
| 61 | 2 | 7.N.2.1 | 2 | 7.N.2.1 | 2 | 7.N.2.1 | 1 | 7.N.2.1 | 2 | 7.N.2.1 | 1 | 7.N.2.1 | 2 | 7.N.2.1 |
| 62 | 2 | 7.S.2.1 | 2 | 7.S.2.1 | 1 | 7.S.1.1 |
| 63 | 2 | 7.G.1.2 | 2 | 7.G.1.2 | 1 | 7.G.1.2 | 2 | 7.G.1.2 | 2 | 7.G.1.2 | 2 | 7.G.1.2 | 1 | 7.G.1.2 |
| 64 | 1 | 7.A.3.1 | 1 | 7.A.2.1 | 2 | 7.A.2.1 | 2 | 7.A.2.1 | 1 | 7.A.2.1 | 1 | 7.A.2.1 | 1 | 7.A.2.1 |
| 65 | 2 | 7.G.2.1 | 2 | 7.G.2.1 | 2 | 7.G.2.1 | 2 | 7.G.2.1 | 2 | 7.M.1.1 | 2 | 7.G.2.1 | 2 | 7.G.2.1 |
| 66 | 2 | 7.S.1.2 | 2 | 7.S.1.2 | 2 | 7.S.1.2 | 1 | 7.S.1.2 | 2 | 7.S.1.2 | 2 | 7.S.1.2 | 1 | 7.S.1.2 |
| 67 | 1 | 7.A.1.2 | 1 | 7.A.1.2 | 1 | 7.A.1.2 | 2 | 7.A.2.1 | 1 | 7.A.2.1 | 2 | 7.A.2.1 | 1 | 7.A.2.1 |
| 68 | 1 | 7.N.1.2 |
| 69 | 2 | 7.S.2.1 | 1 | 7.N.2.1 | 1 | 7.N.2.1 | 2 | 7.N.2.1 | 2 | 7.N.2.1 | 1 | 7.N.2.1 | 2 | 7.N.2.1 |
| 70 | 1 | 7.A.1.2 | 1 | 7.A.1.2 | 1 | 7.A.1.2 | 1 | 7.A.1.2 | 2 | 7.A.1.2 | 1 | 7.A.1.2 | 1 | 7.A.1.2 |
| 71 | 1 | 7.N.2.1 | 1 | 7.N.2.1 | 1 | 7.N.2.1 | 1 | 7.N.2.1 | 2 | 7.N.2.1 | 1 | 7.N.2.1 | 1 | 7.N.2.1 |
| 72 | 2 | 7.S.2.1 | 2 | 7.S.2.1 | 1 | 7.S.2.1 |
| 73 | 1 | 7.G.1.1 |
| 74 | 1 | 7.A.2.1 |
| 75 | 2 | 7.A.4.1 | 1 | 7.A.4.1 | 2 | 7.A.4.1 |
| 76 | 2 | 7.N.2.1 | 2 | 7.N.2.1 | 2 | 7.N.2.1 | 2 | 7.N.3.1 | 2 | 7.N.2.1 | 2 | 7.N.2.1 | 2 | 7.N.2.1 |

Table 7.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 7

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 77 | 2 | 7.A.3.1 | 2 | 7.S.1.2 |
| 78 | 2 | 7.G.2.1 | 1 | 7.G.2.1 | 2 | 7.G.2.1 | 1 | 7.G.2.1 | 2 | 7.G.2.1 | 1 | 7.G.2.1 | 1 | 7.G.2.1 |
| 79 | 1 | 7.M.1.2 | 2 | 7.M.1.2 | 1 | 7.M.1.2 | 2 | 7.M.1.2 | 2 | 7.M.1.2 | 1 | 7.M.1.2 | 1 | 7.M.1.2 |
| 80 | 1 | 7.N.1.1 | 2 | 7.N.3.1 |
| 81 | | | | | | | | | | | | | | |
| 82 | | | | | | | | | | | | | | |
| 83 | 2 | 7.G.2.1 | 1 | 7.G.2.1 | 1 | 7.G.2.1 | 1 | 7.G.2.1 | 1 | 7.M.1.1 | 1 | 7.G.2.1 | 1 | 7.G.2.1 |
| 84 | 2 | 7.A.4.1 | 1 | 7.A.4.1 | 2 | 7.A.4.1 | 2 | 7.A.4.1 | 2 | 7.A.1.1 | 2 | 7.A.4.1 | 2 | 7.A.4.1 |
| 85 | 2 | 7.N.3.1 | 2 | 7.N.2.1 | 2 | 7.N.3.1 |
| 86 | 2 | 7.A.4.1 | 1 | 7.A.4.1 | 2 | 7.A.4.1 | 2 | 7.A.4.1 | 1 | 7.A.4.1 | 2 | 7.A.4.1 | 2 | 7.A.4.1 |
| 87 | 1 | 7.A.1.1 |
| 88 | 2 | 7.G.2.1 | 2 | 7.G.2.1 | 2 | 7.G.2.1 | 2 | 7.G.2.1 | 2 | 7.A.3.2 | 2 | 7.G.2.1 | 2 | 7.G.2.1 |
| 89 | 2 | 7.S.2.1 | 2 | 7.G.2.1 | 1 | 7.S.2.1 | 1 | 7.S.2.1 | 1 | 7.S.2.1 | 1 | 7.S.2.1 | 2 | 7.S.2.1 |
| 90 | 2 | 7.N.3.1 | 1 | 7.N.2 | 1 | 7.N.2.1 |
| 91 | 1 | 7.N.1.1 | 2 | 7.N.3.1 | 2 | 7.N.1.1 | 2 | 7.N.3.1 | 2 | 7.N.3.1 | 1 | 7.N.1.1 | 2 | 7.N.3.1 |
| 92 | 2 | 7.M.1.2 |

Objective Pairwise Comparison: 0.8912
Standard Pairwise Comparison: 0.9705

Table 7.9
 Objectives Coded to Each Item by Reviewers
 South Dakota Mathematics 2008 Grade 7

| Low | | Medium | | High |
|-----|--|----------|--|------|
| 0 | | 6.391304 | | 7 |

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 1 2177354 | 7.M.1.1 |
| 2 3528728 | 7.S.2.1 |
| 3 2177336 | 7.G.2.1 |
| 4 2177393 | 7.A.4.1 |
| 5 3332293 | 7.A.1.2 |
| 6 2177391 | 7.A.4.1 |
| 7 2345809 | 7.G.1.1 |
| 8 2177376 | 7.N.1.1 |
| 9 2177386 | 7.A.3.2 | 7.A.3.2 | 7.A.3.2 | 7.A.3.2 | 7.A.3.2 | 7.N.3.1 | 7.N.3.1 |
| 10 3348307 | 7.A.4.1 |
| 11 2106838 | 7.N.1.2 |
| 12 3534103 | 7.A.1 | 7.A.1.1 | 7.A.1.1 | 7.A.1.1 | 7.A.1.1 | 7.A.1.1 | 7.A.1.1 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 2177321 | 7.S.1.2 |
| 17 3430181 | 7.S.1.2 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 |
| 18 2177329 | 7.G.1.1 |
| 19 2345796 | 7.M.1.1 |
| 20 2177304 | 7.A.1.1 |
| 21 2177360 | 7.N.1.1 |
| 22 2177375 | 7.N.1.1 | 7.N.1.1 | 7.N.1.1 | 7.N.1.1 | 7.N.1.1 | 7.N.2.1 | 7.N.3.1 |
| 23 2177316 | 7.A.1.1 | 7.A.2.1 | 7.A.2.1 | 7.A.2.1 | 7.A.2.1 | 7.A.2.1 | 7.A.2.1 |
| 24 2345802 | 7.N.2.1 | 7.N.2.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 |
| 25 2177382 | 7.A.3.2 |
| 26 3529192 | 7.N.2.1 |
| 27 2345800 | 7.N.1.2 | 7.N.1.2 | 7.N.1.2 | 7.N.1.2 | 7.N.1.2 | 7.N.1.2 | 7.N.2.1 |
| 28 3529167 | 7.S.1.1 |
| 29 2177320 | 7.S.1.2 |
| 30 2106860 | 7.G.1 | 7.G.1 | 7.G.1 | 7.G.1 | 7.G.1 | 7.G.1 | 7.G.1.1 |
| 31 3529216 | 7.N.1.1 |
| 32 3527216 | 7.A.3.1 |
| 33 3529626 | 7.S.2.1 |
| 34 3526950 | 7.A.2.1 |
| 35 2177352 | 7.G.1.1 |
| 36 3526915 | 7.A.1.1 |
| 37 2177322 | 7.A.3.1 |
| 38 3527223 | 7.A.3.2 |

Table 7.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 7

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 39 3528648 | 7.N.2.1 | 7.N.2.1 | 7.N.2.1 | 7.N.2.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 |
| 40 | | | | | | | |
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 2345807 | 7.M.1.1 |
| 44 2345812 | 7.N.2.1 |
| 45 2345795 | 7.A.1.1 |
| 46 2345799 | 7.N.2.1 |
| 47 3348312 | 7.A.4.1 |
| 48 3528722 | 7.S.1.1 |
| 49 3526952 | 7.A.2.1 |
| 50 3529623 | 7.G.2.1 |
| 51 2177310 | 7.S.2.1 |
| 52 3528719 | 7.S.1.1 |
| 53 3528047 | 7.A.2.1 |
| 54 3528622 | 7.M.1.2 |
| 55 2345797 | 7.G.1.1 | 7.G.1.1 | 7.G.1.1 | 7.G.1.1 | 7.G.1.1 | 7.G.1.1 | 7.M.1.1 |
| 56 2177365 | 7.N.2.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 |
| 57 3529396 | 7.G.2.1 |
| 58 2177395 | 7.S.1.2 |
| 59 2345806 | 7.A.1.2 |
| 60 3529382 | 7.G.1.1 |
| 61 3529178 | 7.N.2.1 |
| 62 3529688 | 7.S.1.1 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 |
| 63 2177333 | 7.G.1.2 |
| 64 3430179 | 7.A.2.1 | 7.A.2.1 | 7.A.2.1 | 7.A.2.1 | 7.A.2.1 | 7.A.2.1 | 7.A.3.1 |
| 65 3344861 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 | 7.M.1.1 |
| 66 3528724 | 7.S.1.2 |
| 67 2177307 | 7.A.1.2 | 7.A.1.2 | 7.A.1.2 | 7.A.2.1 | 7.A.2.1 | 7.A.2.1 | 7.A.2.1 |
| 68 3528638 | 7.N.1.2 |
| 69 2177371 | 7.N.2.1 | 7.N.2.1 | 7.N.2.1 | 7.N.2.1 | 7.N.2.1 | 7.N.2.1 | 7.S.2.1 |
| 70 3525691 | 7.A.1.2 |
| 71 3332171 | 7.N.2.1 |
| 72 2177302 | 7.S.2.1 |
| 73 3529383 | 7.G.1.1 |
| 74 2177309 | 7.A.2.1 |
| 75 3348301 | 7.A.4.1 |
| 76 3344868 | 7.N.2.1 | 7.N.2.1 | 7.N.2.1 | 7.N.2.1 | 7.N.2.1 | 7.N.2.1 | 7.N.3.1 |
| 77 2177319 | 7.A.3.1 | 7.S.1.2 | 7.S.1.2 | 7.S.1.2 | 7.S.1.2 | 7.S.1.2 | 7.S.1.2 |
| 78 3344909 | 7.G.2.1 |
| 79 2177347 | 7.M.1.2 |
| 80 3529245 | 7.N.1.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 |

Table 7.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 7

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 3332316 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 | 7.M.1.1 |
| 84 3528029 | 7.A.1.1 | 7.A.4.1 | 7.A.4.1 | 7.A.4.1 | 7.A.4.1 | 7.A.4.1 | 7.A.4.1 |
| 85 3344907 | 7.N.2.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 |
| 86 3528032 | 7.A.4.1 |
| 87 3430178 | 7.A.1.1 |
| 88 3430180 | 7.A.3.2 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 | 7.G.2.1 |
| 89 3430182 | 7.G.2.1 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 | 7.S.2.1 |
| 90 2177380 | 7.N.2 | 7.N.2.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 |
| 91 2177369 | 7.N.1.1 | 7.N.1.1 | 7.N.1.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 | 7.N.3.1 |
| 92 2177346 | 7.M.1.2 |

Table 7.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 7

| | | | | |
|-----|--|----------|--|------|
| Low | | Medium | | High |
| 0 | | 16.33333 | | 58 |

| | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| 7.A | | | | | | | | | | | | | | | | | | | | |
| 7.A.1 | 1 | | | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | | | |
| 7.A.1.1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 6 | 6 | 6 | 6 | 6 | |
| | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | |
| | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | |
| 7.A.1.2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 7 | 7 | |
| | | | | | | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 7 | 7 | 7 | 0 | 0 | |
| | 7 | 7 | 7 | 7 | | | | | | | | | | | | | | | | |
| | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | |
| 7.A.2 | | | | | | | | | | | | | | | | | | | | |
| 7.A.2.1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 9 | 9 | 9 | 9 | 9 | 9 | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | 4 | |
| | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | | | | |
| | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | | | | | | |
| 7.A.3 | | | | | | | | | | | | | | | | | | | | |
| 7.A.3.1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 7 | | | | | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 4 | 7 | | | | |
| 7.A.3.2 | 9 | 9 | 9 | 9 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 8 | |
| | | | | | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | |
| 7.A.4 | | | | | | | | | | | | | | | | | | | | |
| 7.A.4.1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 1 | 1 | 1 | 1 | 1 | |
| | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | |
| | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | |
| | 0 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | |
| | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | | | | | |
| 7.G | | | | | | | | | | | | | | | | | | | | |
| 7.G.1 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | | | | | | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| 7.G.1.1 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | |
| | | | | | | | | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 0 | 5 | 5 | 5 | 5 | |
| | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 3 | |
| | 7 | 7 | 7 | | | | | | | | | | | | | | | | | |

Table 7.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 7

| | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | | | | | | | | | | | | | | | | | |
| 7.G.1.2 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 7.G.2 | | | | | | | | | | | | | | | | | | | | |
| 7.G.2.1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 7 | 7 |
| | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 7 | 5 | 5 | 5 | 5 | 5 | 5 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | |
| | 3 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | |
| 7.M | | | | | | | | | | | | | | | | | | | | |
| 7.M.1 | | | | | | | | | | | | | | | | | | | | |
| 7.M.1.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | | | | | | | 9 | 9 | 9 | 9 | 9 | 9 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 4 | 5 | 6 | 8 | | | | | | | | | | | | | | | | |
| | 3 | 5 | 5 | 3 | | | | | | | | | | | | | | | | |
| 7.M.1.2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | 9 | 9 | 9 | 9 | 9 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 9 | | | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | | | |
| 7.N | | | | | | | | | | | | | | | | | | | | |
| 7.N.1 | | | | | | | | | | | | | | | | | | | | |
| 7.N.1.1 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 3 | 3 | 3 | 3 | 3 | 3 | 8 | 9 | 9 | 9 | | | | | | | | | | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | | | | | | | | | | |
| 7.N.1.2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | | | | | | | | | | | | | | | | | | | |
| 7.N.2 | 9 | | | | | | | | | | | | | | | | | | | |
| | 0 | | | | | | | | | | | | | | | | | | | |
| 7.N.2.1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 |
| | 2 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 9 | 9 | 9 | 9 | 4 | 4 | 4 | 4 | 4 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 9 | 9 |
| | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 9 | 9 |
| | 9 | 9 | 9 | 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 0 | 0 |
| 7.N.3 | | | | | | | | | | | | | | | | | | | | |
| 7.N.3.1 | 9 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 8 | 8 |
| | | | 2 | 4 | 4 | 4 | 4 | 4 | 9 | 9 | 9 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0 | 0 |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |

Table 7.10
Items Coded by Reviewers to Each Objective
South Dakota Mathematics 2008 Grade 7

| | | | | | | | | | | | | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | | | | | | | | | | | | | | | |
| 7.S | | | | | | | | | | | | | | | | | | | |
| 7.S.1 | | | | | | | | | | | | | | | | | | | |
| 7.S.1.1 | 2 8 | 4 8 | 5 2 | 5 2 | 5 2 | 5 2 | 5 2 |
| | 5 2 | 6 2 | | | | | | | | | | | | | | | | | |
| 7.S.1.2 | 1 6 | 1 7 | 2 9 | 5 8 | 5 8 | 5 8 | 5 8 |
| | 5 8 | 5 8 | 6 6 | 7 7 | 7 7 | 7 7 | 7 7 | 7 7 | | | | | |
| 7.S.2 | | | | | | | | | | | | | | | | | | | |
| 7.S.2.1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 7 | 1 7 | 1 7 | 1 7 | 1 7 | 1 7 | 3 3 | 3 3 | 3 3 | 3 3 | 3 3 | 3 3 |
| | 5 1 | 6 2 | 6 2 | 6 2 | 6 2 | 6 2 | 6 2 | 6 9 | 7 2 | 7 2 | 7 2 | 7 2 | 7 2 |
| | 7 2 | 7 2 | 8 9 | 8 9 | 8 9 | 8 9 | 8 9 | 8 9 | | | | | | | | | | | |

Table 7.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 7

| Low | | Medium | | High |
|---------|------|--------|------|---|
| 1 | | 3 | | 7 |
| 7.A | | | | |
| 7.A.1 | 12:1 | | | |
| 7.A.1.1 | 12:6 | 20:7 | 23:1 | 36:7 45:7 84:1 87:7 |
| 7.A.1.2 | 5:7 | 59:7 | 67:3 | 70:7 |
| 7.A.2 | | | | |
| 7.A.2.1 | 23:6 | 34:7 | 49:7 | 53:7 64:6 67:4 74:7 |
| 7.A.3 | | | | |
| 7.A.3.1 | 32:7 | 37:7 | 64:1 | 77:1 |
| 7.A.3.2 | 9:5 | 25:7 | 38:7 | 88:1 |
| 7.A.4 | | | | |
| 7.A.4.1 | 4:7 | 6:7 | 10:7 | 47:7 75:7 84:6 86:7 |
| 7.G | | | | |
| 7.G.1 | 30:6 | | | |
| 7.G.1.1 | 7:7 | 18:7 | 30:1 | 35:7 55:6 60:7 73:7 |
| 7.G.1.2 | 63:7 | | | |
| 7.G.2 | | | | |
| 7.G.2.1 | 3:7 | 50:7 | 57:7 | 65:6 78:7 83:6 88:6 89:1 |
| 7.M | | | | |
| 7.M.1 | | | | |
| 7.M.1.1 | 1:7 | 19:7 | 43:7 | 55:1 65:1 83:1 |
| 7.M.1.2 | 54:7 | 79:7 | 92:7 | |
| 7.N | | | | |
| 7.N.1 | | | | |
| 7.N.1.1 | 8:7 | 21:7 | 22:5 | 31:7 80:1 91:3 |
| 7.N.1.2 | 11:7 | 27:6 | 68:7 | |
| 7.N.2 | 90:1 | | | |
| 7.N.2.1 | 22:1 | 24:2 | 26:7 | 27:1 39:4 44:7 46:7 56:1 61:7 69:6 71:7 76:6 85:1 |
| | 90:1 | | | |
| 7.N.3 | | | | |
| 7.N.3.1 | 9:2 | 22:1 | 24:5 | 39:3 56:6 76:1 80:6 85:6 90:5 91:4 |
| 7.S | | | | |
| 7.S.1 | | | | |
| 7.S.1.1 | 28:7 | 48:7 | 52:7 | 62:1 |
| 7.S.1.2 | 16:7 | 17:1 | 29:7 | 58:7 66:7 77:6 |
| 7.S.2 | | | | |
| 7.S.2.1 | 2:7 | 17:6 | 33:7 | 51:7 62:6 69:1 72:7 89:6 |

Table 7.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 7

| Low | | Medium | | High |
|-----|--|--------|--|------|
| 1 | | 3 | | 7 |

| | | | |
|------------|-----------|-----------|-----------|
| 1 2177354 | 7.M.1.1:7 | | |
| 2 3528728 | 7.S.2.1:7 | | |
| 3 2177336 | 7.G.2.1:7 | | |
| 4 2177393 | 7.A.4.1:7 | | |
| 5 3332293 | 7.A.1.2:7 | | |
| 6 2177391 | 7.A.4.1:7 | | |
| 7 2345809 | 7.G.1.1:7 | | |
| 8 2177376 | 7.N.1.1:7 | | |
| 9 2177386 | 7.A.3.2:5 | 7.N.3.1:2 | |
| 10 3348307 | 7.A.4.1:7 | | |
| 11 2106838 | 7.N.1.2:7 | | |
| 12 3534103 | 7.A.1.1 | 7.A.1.1:6 | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 2177321 | 7.S.1.2:7 | | |
| 17 3430181 | 7.S.1.2:1 | 7.S.2.1:6 | |
| 18 2177329 | 7.G.1.1:7 | | |
| 19 2345796 | 7.M.1.1:7 | | |
| 20 2177304 | 7.A.1.1:7 | | |
| 21 2177360 | 7.N.1.1:7 | | |
| 22 2177375 | 7.N.1.1:5 | 7.N.2.1:1 | 7.N.3.1:1 |
| 23 2177316 | 7.A.1.1:1 | 7.A.2.1:6 | |
| 24 2345802 | 7.N.2.1:2 | 7.N.3.1:5 | |
| 25 2177382 | 7.A.3.2:7 | | |
| 26 3529192 | 7.N.2.1:7 | | |
| 27 2345800 | 7.N.1.2:6 | 7.N.2.1:1 | |
| 28 3529167 | 7.S.1.1:7 | | |
| 29 2177320 | 7.S.1.2:7 | | |
| 30 2106860 | 7.G.1:6 | 7.G.1.1:1 | |
| 31 3529216 | 7.N.1.1:7 | | |
| 32 3527216 | 7.A.3.1:7 | | |
| 33 3529626 | 7.S.2.1:7 | | |
| 34 3526950 | 7.A.2.1:7 | | |
| 35 2177352 | 7.G.1.1:7 | | |
| 36 3526915 | 7.A.1.1:7 | | |
| 37 2177322 | 7.A.3.1:7 | | |
| 38 3527223 | 7.A.3.2:7 | | |

Table 7.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 7

| | | |
|------------|-----------|-----------|
| 39 3528648 | 7.N.2.1:4 | 7.N.3.1:3 |
| 40 | | |
| 41 | | |
| 42 | | |
| 43 2345807 | 7.M.1.1:7 | |
| 44 2345812 | 7.N.2.1:7 | |
| 45 2345795 | 7.A.1.1:7 | |
| 46 2345799 | 7.N.2.1:7 | |
| 47 3348312 | 7.A.4.1:7 | |
| 48 3528722 | 7.S.1.1:7 | |
| 49 3526952 | 7.A.2.1:7 | |
| 50 3529623 | 7.G.2.1:7 | |
| 51 2177310 | 7.S.2.1:7 | |
| 52 3528719 | 7.S.1.1:7 | |
| 53 3528047 | 7.A.2.1:7 | |
| 54 3528622 | 7.M.1.2:7 | |
| 55 2345797 | 7.G.1.1:6 | 7.M.1.1:1 |
| 56 2177365 | 7.N.2.1:1 | 7.N.3.1:6 |
| 57 3529396 | 7.G.2.1:7 | |
| 58 2177395 | 7.S.1.2:7 | |
| 59 2345806 | 7.A.1.2:7 | |
| 60 3529382 | 7.G.1.1:7 | |
| 61 3529178 | 7.N.2.1:7 | |
| 62 3529688 | 7.S.1.1:1 | 7.S.2.1:6 |
| 63 2177333 | 7.G.1.2:7 | |
| 64 3430179 | 7.A.2.1:6 | 7.A.3.1:1 |
| 65 3344861 | 7.G.2.1:6 | 7.M.1.1:1 |
| 66 3528724 | 7.S.1.2:7 | |
| 67 2177307 | 7.A.1.2:3 | 7.A.2.1:4 |
| 68 3528638 | 7.N.1.2:7 | |
| 69 2177371 | 7.N.2.1:6 | 7.S.2.1:1 |
| 70 3525691 | 7.A.1.2:7 | |
| 71 3332171 | 7.N.2.1:7 | |
| 72 2177302 | 7.S.2.1:7 | |
| 73 3529383 | 7.G.1.1:7 | |
| 74 2177309 | 7.A.2.1:7 | |
| 75 3348301 | 7.A.4.1:7 | |
| 76 3344868 | 7.N.2.1:6 | 7.N.3.1:1 |
| 77 2177319 | 7.A.3.1:1 | 7.S.1.2:6 |
| 78 3344909 | 7.G.2.1:7 | |
| 79 2177347 | 7.M.1.2:7 | |
| 80 3529245 | 7.N.1.1:1 | 7.N.3.1:6 |

Table 7.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
South Dakota Mathematics 2008 Grade 7

| | | | |
|------------|-----------|-----------|-----------|
| 81 | | | |
| 82 | | | |
| 83 3332316 | 7.G.2.1:6 | 7.M.1.1:1 | |
| 84 3528029 | 7.A.1.1:1 | 7.A.4.1:6 | |
| 85 3344907 | 7.N.2.1:1 | 7.N.3.1:6 | |
| 86 3528032 | 7.A.4.1:7 | | |
| 87 3430178 | 7.A.1.1:7 | | |
| 88 3430180 | 7.A.3.2:1 | 7.G.2.1:6 | |
| 89 3430182 | 7.G.2.1:1 | 7.S.2.1:6 | |
| 90 2177380 | 7.N.2:1 | 7.N.2.1:1 | 7.N.3.1:5 |
| 91 2177369 | 7.N.1.1:3 | 7.N.3.1:4 | |
| 92 2177346 | 7.M.1.2:7 | | |

Table 7.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 7

| Low DOK | | Matched DOK | | High DOK |
|---------|--|-------------|--|----------|
| 1 | | 3 | | 7 |

| | | | | | | | |
|---------------------|-------------------|--------------------|-------------|--------------------|--------------------|--------------------|--------------------|
| 7.A [2]: | | | | | | | |
| 7.A. 1 [2]: | 12:1 [2] | | | | | | |
| 7.A. 1.1 [2]: | 12:6 [2] | 20:7 [1] | 23:1 [1] | 36:7 [1] | 45:7 [1.2 9] | 84:1 [2] | 87:7 [1] |
| 7.A. 1.2 [1]: | 5:7 [1] | 59:7 [1] | 67:3 [1] | 70:7 [1.1 4] | | | |
| 7.A. 2 [2]: | | | | | | | |
| 7.A. 2.1 [2]: | 23:6 [1] | 34:7 [1.2 9] | 49:7 [1] | 53:7 [1] | 64:6 [1.3 3] | 67:4 [1.5] | 74:7 [1] |
| 7.A. 3 [2]: | | | | | | | |
| 7.A. 3.1 [1]: | 32:7 [1] | 37:7 [1] | 64:1 [1] | 77:1 [2] | | | |
| 7.A. 3.2 [2]: | 9:5 [1.8] | 25:7 [1.7 1] | 38:7 [1] | 88:1 [2] | | | |
| 7.A. 4 [2]: | | | | | | | |
| 7.A. 4.1 [2]: | 4:7 [1.86] | 6:7 [1.43] | 10:7 [2] | 47:7 [1.1 4] | 75:7 [1.8 6] | 84:6 [1.8 3] | 86:7 [1.7 1] |
| 7.G [1]: | | | | | | | |
| 7.G. 1 [1]: | 30:6 [2] | | | | | | |
| 7.G. | 7:7 [1] | 18:7 | 30:1 | 35:7 | 55:6 | 60:7 | 73:7 |

Table 7.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 7

| | | | | | | | | | | |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|--------------------|--------------------|-------------|-------------|
| [2]: | | | | | | | | | | |
| 7.N. 3.1 [2]: | 9:2[2] | 22:1 [2] | 24:5 [2] | 39:3 [2] | 56:6 [2] | 76:1 [2] | 80:6 [2] | 85:6 [2] | 90:5 [2] | 91:4 [2] |
| 7.S [1]: | | | | | | | | | | |
| 7.S. 1 [2]: | | | | | | | | | | |
| 7.S. 1.1 [1]: | 28:7 [1.1 4] | 48:7 [1] | 52:7 [2] | 62:1 [1] | | | | | | |
| 7.S. 1.2 [2]: | 16:7 [2] | 17:1 [1] | 29:7 [2] | 58:7 [2] | 66:7 [1.7 1] | 77:6 [2] | | | | |
| 7.S. 2 [1]: | | | | | | | | | | |
| 7.S. 2.1 [1]: | 2:7[2] | 17:6 [1.3 3] | 33:7 [1.2 9] | 51:7 [1.4 3] | 62:6 [1.3 3] | 69:1 [2] | 72:7 [1.2 9] | 89:6 [1.3 3] | | |

Table 8.1
Categorical Concurrence Between Standards and Assessment as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 8
Number of Assessment Items - 84

| Standards | | | Level by Objective | | | Hits | | Cat. Concurr. |
|-------------------------------------|------------|-----------|--------------------|-----------------------|------------------------|-------|------|------------------|
| Title | Goals # | Objs # | Level | # of objs by Level | % w/in std by Level | Mean | S.D. | |
| 8.A - ALGEBRA | 4 | 5.14 | 1 2 | 1 4 | 20 80 | 28.57 | 1.29 | YES |
| 8.G - GEOMETRY | 2 | 3 | 1 2 | 2 1 | 66 33 | 11.86 | 1.36 | YES |
| 8.M - MEASUREMENT | 1 | 2 | 1 2 | 1 1 | 50 50 | 9.14 | 1.36 | YES |
| 8.N - NUMBER SENSE | 3 | 3 | 1 2 | 2 1 | 66 33 | 21 | 2.20 | YES |
| 8.S - STATISTICS AND PROBABILITY | 2 | 3 | 1 2 | 1 2 | 33 66 | 13.43 | 1.05 | YES |
| Total | 12 | 16.14 | 1 2 | 7 9 | 43 56 | 84 | 0 | |

Table 8.2a

Alternate Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Seven Reviewers (Does Not Assume Each Objective Should Have Equal Representation)

South Dakota Mathematics 2008 Grade 8

Number of Assessment Items - 84

| Standards | | | Hits | | Level of Item w.r.t. Standard | | | | | | DOK Consistency |
|----------------------------------|---------|--------|-------|------|-------------------------------|------|------|------|---------|------|-----------------|
| | | | | | % Under | | % At | | % Above | | |
| Title | Goals # | Objs # | M | S.D. | M | S.D. | M | S.D. | M | S.D. | |
| 8.A - ALGEBRA | 4 | 5.14 | 28.57 | 1.29 | 32 | 248 | 66 | 30 | 2 | 5 | YES |
| 8.G - GEOMETRY | 2 | 3 | 11.86 | 1.36 | 15 | 134 | 71 | 25 | 14 | 22 | YES |
| 8.M - MEASUREMENT | 1 | 2 | 9.14 | 1.36 | 10 | 99 | 65 | 30 | 26 | 31 | YES |
| 8.N - NUMBER SENSE | 3 | 3 | 21 | 2.20 | 10 | 134 | 77 | 19 | 13 | 16 | YES |
| 8.S - STATISTICS AND PROBABILITY | 2 | 3 | 13.43 | 1.05 | 13 | 105 | 72 | 32 | 15 | 36 | YES |
| Total | 12 | 16.14 | 84 | 0 | 17 | 25 | 71 | 28 | 12 | 24 | |

Table 8.3

Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Seven Reviewers

South Dakota Mathematics 2008 Grade 8

Number of Assessment Items - 84

| Standards | | | Hits | | Range of Objectives | | | | Rng. of Know. | Balance Index | | | | Bal. of Represent. |
|----------------------------------|---------|--------|-------|------|---------------------|------|------------|------|---------------|------------------------|------|-------|------|--------------------|
| | | | | | # Objs Hit | | % of Total | | | % Hits in Std/Ttl Hits | | Index | | |
| Title | Goals # | Objs # | Mean | S.D. | Mean | S.D. | Mean | S.D. | | Mean | S.D. | Mean | S.D. | |
| 8.A - ALGEBRA | 4 | 5.14 | 28.57 | 1.29 | 5.14 | 0.35 | 100 | 0 | YES | 34 | 2 | 0.83 | 0.04 | YES |
| 8.G - GEOMETRY | 2 | 3 | 11.86 | 1.36 | 3 | 0 | 100 | 0 | YES | 14 | 2 | 0.90 | 0.03 | YES |
| 8.M - MEASUREMENT | 1 | 2 | 9.14 | 1.36 | 2 | 0 | 100 | 0 | YES | 11 | 2 | 0.83 | 0.09 | YES |
| 8.N - NUMBER SENSE | 3 | 3 | 21 | 2.20 | 3 | 0 | 100 | 0 | YES | 25 | 3 | 0.89 | 0.11 | YES |
| 8.S - STATISTICS AND PROBABILITY | 2 | 3 | 13.43 | 1.05 | 3 | 0 | 100 | 0 | YES | 16 | 1 | 0.83 | 0.05 | YES |
| Total | 12 | 16.14 | 84 | 0 | 3.23 | 1.04 | 100 | 0 | | 20 | 9 | 0.85 | 0.08 | |

Table 8.4

Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 8
Number of Assessment Items - 84

| Standards | Alignment Criteria | | | |
|----------------------------------|-------------------------|--------------------------------|--------------------|---------------------------|
| | Categorical Concurrence | Depth-of-Knowledge Consistency | Range of Knowledge | Balance of Representation |
| 8.A - ALGEBRA | YES | YES | YES | YES |
| 8.G - GEOMETRY | YES | YES | YES | YES |
| 8.M - MEASUREMENT | YES | YES | YES | YES |
| 8.N - NUMBER SENSE | YES | YES | YES | YES |
| 8.S - STATISTICS AND PROBABILITY | YES | YES | YES | YES |

Table 8.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 8

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 3 | 2 | 1 | 2 | 2 | 2 | 1 | 2 |
| 4 | 1 | 2 | 2 | 2 | 2 | 3 | 2 |
| 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7 | 2 | 2 | 1 | 2 | 2 | 1 | 1 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 10 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| 11 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 17 | 1 | 2 | 1 | 1 | 2 | 1 | 2 |
| 18 | 2 | 1 | 1 | 1 | 2 | 2 | 1 |
| 19 | 1 | 1 | 1 | 2 | 2 | 2 | 1 |
| 20 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 21 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| 22 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 23 | 1 | 2 | 1 | 1 | 2 | 2 | 2 |
| 24 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 25 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 26 | 2 | 1 | 1 | 2 | 2 | 1 | 1 |
| 27 | 1 | 1 | 1 | 1 | 2 | 2 | 1 |
| 28 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| 29 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| 30 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 31 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 32 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 33 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 34 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 35 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 36 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 37 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 38 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 39 | 2 | 1 | 1 | 1 | 2 | 2 | 1 |
| 40 | | | | | | | |

Table 8.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 8

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 44 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 45 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 46 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 47 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 48 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 49 | 1 | 1 | 1 | 1 | 2 | 1 | 2 |
| 50 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 51 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 52 | 1 | 2 | 2 | 2 | 2 | 2 | 1 |
| 53 | 1 | 2 | 1 | 1 | 2 | 2 | 2 |
| 54 | 1 | 2 | 2 | 1 | 2 | 1 | 1 |
| 55 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 56 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 57 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 58 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 59 | 2 | 2 | 1 | 1 | 2 | 1 | 2 |
| 60 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 61 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 62 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 63 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| 64 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 65 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 66 | 1 | 2 | 1 | 2 | 1 | 2 | 1 |
| 67 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 68 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 69 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 70 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 71 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| 72 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 73 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 74 | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| 75 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 76 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 77 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 78 | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| 79 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 80 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |

Table 8.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 8

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| 84 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 85 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 86 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 87 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 88 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 89 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 90 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 91 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| 92 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Intraclass Correlation: 0.8856

Pairwise Comparison: 0.7477

Table 8.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 8

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 1 | 1 | 8.A.1.1 | 2 | 8.A.1.1 |
| 2 | 2 | 8.N.3.1 | 2 | 8.N.2.1 | 1 | 8.N.3.1 |
| 3 | 2 | 8.N.3.1 | 1 | 8.N.3.1 | 2 | 8.N.3.1 | 2 | 8.N.3.1 | 2 | 8.N.3.1 | 1 | 8.N.3.1 | 2 | 8.N.3.1 |
| 4 | 1 | 8.S.1.1 | 2 | 8.S.1.1 | 2 | 8.S.1.1 | 2 | 8.S.1.1 | 2 | 8.S.1.1 | 3 | 8.S.1.1 | 2 | 8.S.1.1 |
| 5 | 1 | 8.N.1.1 | 1 | 8.N.1.1 | 1 | 8.N.1.1 | 1 | 8.N.1.1 | 1 | 8.A.1.1 | 1 | 8.N.2.1 | 1 | 8.N.1.1 |
| 6 | 1 | 8.A.3.1 |
| 7 | 2 | 8.S.2.1 | 2 | 8.S.2.1 | 1 | 8.S.2.1 | 2 | 8.S.2.1 | 2 | 8.S.2.1 | 1 | 8.N.2.1 | 1 | 8.S.2.1 |
| 8 | 1 | 8.N.1.1 | 1 | 8.N.2.1 | 1 | 8.N.1.1 |
| 9 | 2 | 8.A.2.1 |
| 10 | 2 | 8.S.2.1 | 2 | 8.S.2.1 | 1 | 8.S.2.1 | 2 | 8.S.2.1 | 2 | 8.S.2.1 | 2 | 8.S.2.1 | 1 | 8.S.2.1 |
| 11 | 1 | 8.N.2.1 | 1 | 8.N.1.1 | 1 | 8.N.2.1 |
| 12 | 2 | 8.S.2.1 | 1 | 8.S.1.2 | 2 | 8.S.1.2 |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 16 | 2 | 8.S.2.1 | 2 | 8.N.2.1 | 1 | 8.S.2.1 |
| 17 | 1 | 8.A.2.1 | 2 | 8.A.2.1 | 1 | 8.A.2.1 | 1 | 8.A.2.1 | 2 | 8.A.2.1 | 1 | 8.A.2.1 | 2 | 8.A.2.1 |
| 18 | 2 | 8.N.3.1 | 1 | 8.N.3.1 | 1 | 8.N.2.1 | 1 | 8.N.3.1 | 2 | 8.N.2.1 | 2 | 8.N.2.1 | 1 | 8.N.2.1 |
| 19 | 1 | 8.A.4.2 | 1 | 8.A.4.2 | 1 | 8.A.4.2 | 2 | 8.A.4.2 | 2 | 8.A.4.2 | 2 | 8.A.4.2 | 1 | 8.A.4.2 |
| 20 | 1 | 8.A.1.1 | 1 | 8.N.2.1 | 1 | 8.N.2.1 | 1 | 8.N.2.1 | 2 | 8.N.2.1 | 1 | 8.N.2.1 | 1 | 8.N.2.1 |
| 21 | 2 | 8.N.3.1 | 1 | 8.N.3.1 | 2 | 8.N.3.1 |
| 22 | 1 | 8.G.1.1 |
| 23 | 1 | 8.N.1.1 | 2 | 8.A.1.1 | 1 | 8.N.1.1 | 1 | 8.N.1.1 | 2 | 8.N.1.1 | 2 | 8.N.2.1 | 2 | 8.N.1.1 |
| 24 | 2 | 8.A.2.1 | 1 | 8.A.2.1 |
| 25 | 1 | 8.N.2.1 | 1 | 8.N.2.1 | 1 | 8.N.2.1 | 1 | 8.N.1.1 | 2 | 8.N.1.1 | 1 | 8.N.2.1 | 1 | 8.N.2.1 |
| 26 | 2 | 8.N.1.1 | 1 | 8.N.1.1 | 1 | 8.N.1.1 | 2 | 8.N.1.1 | 2 | 8.A.1.1 | 1 | 8.N.1.1 | 1 | 8.N.1.1 |
| 27 | 1 | 8.G.1.2 | 1 | 8.G.1.2 | 1 | 8.G.1.2 | 1 | 8.G.1.2 | 2 | 8.G.1.2 | 2 | 8.G.1.2 | 1 | 8.G.1.2 |
| 28 | 1 | 8.M.1.2 | 2 | 8.M.1.2 | 1 | 8.M.1.2 | 1 | 8.M.1.2 | 2 | 8.M.1.2 | 1 | 8.M.1.2 | 1 | 8.M.1.2 |
| 29 | 2 | 8.S.1.2 | 1 | 8.S.1.2 | 2 | 8.S.1.2 |
| 30 | 1 | 8.N.2.1 |
| 31 | 1 | 8.N.2.1 | 1 | 8.A.2.1 | 1 | 8.A.2.1 | 1 | 8.A.2.1 | 2 | 8.A.2.1 | 1 | 8.A.2.1 | 1 | 8.A.2.1 |
| 32 | 2 | 8.M.1.1 | 1 | 8.M.1.1 |
| 33 | 2 | 8.A.3.1 |
| 34 | 1 | 8.A.2.1 | 1 | 8.A.2.1 | 1 | 8.A.2.1 | 1 | 8.A.2.1 | 2 | 8.A.2.1 | 1 | 8.A.1.1 | 1 | 8.A.2.1 |
| 35 | 2 | 8.M.1.1 | 1 | 8.M.1.1 | 1 | 8.G.2.1 | 1 | 8.G.2.1 | 1 | 8.G.2.1 | 1 | 8.M.1.1 | 1 | 8.G.2.1 |
| 36 | 2 | 8.A.3.1 | 2 | 8.A.4.2 | 2 | 8.A.4.2 | 2 | 8.A.4.2 | 2 | 8.A.4.2 | 2 | 8.A.3.1 | 2 | 8.A.4.2 |
| 37 | 2 | 8.S.2.1 | 2 | 8.N.2.1 | 2 | 8.S.2.1 |
| 38 | 2 | 8.A.4.1 | 2 | 8.A.4.1 | 2 | 8.A.4.2 | 2 | 8.A.4.2 | 2 | 8.A.4.2 | 2 | 8.A.4.2 | 1 | 8.A.4.2 |

Table 8.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 8

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 39 | 2 | 8.M.1.2 | 1 | 8.M.1.2 | 1 | 8.M.1.2 | 1 | 8.M.1.2 | 2 | 8.M.1.2 | 2 | 8.M.1.2 | 1 | 8.M.1.2 |
| 40 | | | | | | | | | | | | | | |
| 41 | | | | | | | | | | | | | | |
| 42 | | | | | | | | | | | | | | |
| 43 | 2 | 8.G.2.1 | 2 | 8.M.1.1 | 1 | 8.G.2.1 |
| 44 | 2 | 8.S.1.1 |
| 45 | 1 | 8.A.1.1 | 1 | 8.N.2.1 | 1 | 8.A.1.1 |
| 46 | 1 | 8.A.1.1 | 1 | 8.A.1.1 | 1 | 8.N.2.1 |
| 47 | 1 | 8.M.1.2 | 2 | 8.M.1.2 | 1 | 8.M.1.2 |
| 48 | 1 | 8.A.4.2 | 1 | 8.A.4.2 | 1 | 8.A.1 | 1 | 8.A.2.1 | 2 | 8.A.2.1 | 1 | 8.N.1.1 | 1 | 8.A.2.1 |
| 49 | 1 | 8.N.1.1 | 1 | 8.N.1.1 | 1 | 8.N.1.1 | 1 | 8.N.1.1 | 2 | 8.N.1.1 | 1 | 8.N.1.1 | 2 | 8.N.1.1 |
| 50 | 1 | 8.S.1.2 | 2 | 8.S.1.2 |
| 51 | 1 | 8.A.1.1 |
| 52 | 1 | 8.A.4.2 | 2 | 8.A.4.2 | 2 | 8.A.3.1 | 2 | 8.A.3.1 | 2 | 8.A.3.1 | 2 | 8.A.2.1 | 1 | 8.A.3.1 |
| 53 | 1 | 8.M.1.2 | 2 | 8.M.1.2 | 1 | 8.M.1.2 | 1 | 8.M.1.2 | 2 | 8.M.1.2 | 2 | 8.M.1.2 | 2 | 8.M.1.2 |
| 54 | 1 | 8.G.2.1 | 2 | 8.G.2.1 | 2 | 8.G.2.1 | 1 | 8.G.2.1 | 2 | 8.G.2.1 | 1 | 8.G.2.1 | 1 | 8.G.2.1 |
| 55 | 2 | 8.A.4.1 |
| 56 | 1 | 8.N.1.1 |
| 57 | 2 | 8.M.1.1 | 2 | 8.M.1.1 | 2 | 8.G.2.1 | 2 | 8.G.2.1 | 2 | 8.G.2.1 | 1 | 8.M.1.1 | 2 | 8.G.2.1 |
| 58 | 1 | 8.A.2.1 | 1 | 8.A.2.1 | 1 | 8.A.1.1 | 1 | 8.A.2.1 | 1 | 8.A.2.1 | 1 | 8.A.2.1 | 1 | 8.A.2.1 |
| 59 | 2 | 8.S.2.1 | 2 | 8.S.2.1 | 1 | 8.S.2.1 | 1 | 8.S.2.1 | 2 | 8.S.2.1 | 1 | 8.S.2.1 | 2 | 8.S.2.1 |
| 60 | 1 | 8.N.2.1 | 2 | 8.N.3.1 | 2 | 8.N.2.1 |
| 61 | 1 | 8.A.4.2 | 2 | 8.A.3.1 | 2 | 8.A.4.2 | 2 | 8.A.3.1 | 2 | 8.A.4.2 | 2 | 8.A.4.2 | 2 | 8.A.4.2 |
| 62 | 2 | 8.S.2.1 |
| 63 | 1 | 8.M.1.1 | 1 | 8.M.1.1 | 2 | 8.G.2.1 | 1 | 8.G.2.1 | 1 | 8.G.2.1 | 1 | 8.M.1.1 | 1 | 8.G.2.1 |
| 64 | 2 | 8.S.2.1 |
| 65 | 1 | 8.N.3.1 | 1 | 8.N.3.1 | 1 | 8.N.2.1 |
| 66 | 1 | 8.G.1.1 | 2 | 8.G.1.1 | 1 | 8.G.1.1 | 2 | 8.G.1.1 | 1 | 8.G.1.1 | 2 | 8.G.1.1 | 1 | 8.G.1.1 |
| 67 | 1 | 8.A.3.1 | 1 | 8.A.4.2 | 1 | 8.A.3.1 | 1 | 8.A.3.1 | 2 | 8.A.3.1 | 1 | 8.A.3.1 | 1 | 8.A.3.1 |
| 68 | 1 | 8.A.1.1 | 1 | 8.A.2.1 |
| 69 | 2 | 8.A.4.2 | 2 | 8.A.4.1 | 2 | 8.A.4.2 |
| 70 | 2 | 8.M.1.1 | 2 | 8.G.2.1 | 2 | 8.M.1.1 | 2 | 8.M.1.1 | 2 | 8.M.1.1 | 2 | 8.G.2.1 | 2 | 8.M.1.1 |
| 71 | 1 | 8.S.1.1 | 2 | 8.S.1.1 | 1 | 8.S.1.1 | 1 | 8.S.1.1 | 2 | 8.S.1.2 | 1 | 8.S.1.1 | 1 | 8.S.1.1 |
| 72 | 1 | 8.G.1.1 | 2 | 8.G.1.1 | 1 | 8.G.1.1 |
| 73 | 1 | 8.G.1.2 | 2 | 8.G.1.2 | 1 | 8.G.1.2 |
| 74 | 2 | 8.M.1.2 | 2 | 8.M.1.2 | 1 | 8.M.1.2 | 1 | 8.M.1.2 | 2 | 8.M.1.2 | 2 | 8.M.1.2 | 1 | 8.M.1.2 |
| 75 | 2 | 8.N.3.1 | 2 | 8.N.2.1 | 2 | 8.N.3.1 |
| 76 | 1 | 8.A.3.1 | 1 | 8.A.3.1 | 1 | 8.A.3.1 | 1 | 8.A.3.1 | 2 | 8.A.3.1 | 1 | 8.A.3.1 | 1 | 8.A.3.1 |

Table 8.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 8

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | DOK6 | PObj6 |
|------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|
| 77 | 1 | 8.A.1.1 | 2 | 8.A.1.1 | 1 | 8.A.1.1 |
| 78 | 2 | 8.G.1.2 | 2 | 8.G.1.2 | 1 | 8.G.1.2 | 1 | 8.G.1.2 | 2 | 8.G.1.2 | 2 | 8.G.1.2 | 1 | 8.G.1.2 |
| 79 | 1 | 8.N.1.1 |
| 80 | 2 | 8.S.1.2 | 2 | 8.S.1.2 | 2 | 8.A.4.2 | 2 | 8.S.1.2 | 2 | 8.S.1.2 | 2 | 8.S.1.2 | 1 | 8.S.1.2 |
| 81 | | | | | | | | | | | | | | |
| 82 | | | | | | | | | | | | | | |
| 83 | 2 | 8.M.1.2 | 2 | 8.M.1.2 | 1 | 8.M.1.2 | 1 | 8.M.1.2 | 2 | 8.M.1.2 | 1 | 8.M.1.2 | 1 | 8.M.1.2 |
| 84 | 2 | 8.A.2.1 |
| 85 | 1 | 8.A.1.1 |
| 86 | 2 | 8.N.3.1 | 1 | 8.N.3.1 |
| 87 | 2 | 8.G.2.1 | 1 | 8.G.2.1 |
| 88 | 2 | 8.A.4.1 | 2 | 8.A.4.1 | 2 | 8.A.4.2 |
| 89 | 2 | 8.N.3.1 | 1 | 8.N.2.1 | 2 | 8.N.3.1 |
| 90 | 1 | 8.A.1.1 |
| 91 | 1 | 8.A.3.1 | 2 | 8.A.3.1 | 1 | 8.A.3.1 | 1 | 8.A.3.1 | 2 | 8.A.3.1 | 1 | 8.A.3.1 | 1 | 8.A.3.1 |
| 92 | 1 | 8.G.1.2 |

Objective Pairwise Comparison: 0.8226
Standard Pairwise Comparison: 0.9274

Table 8.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 8

| Low | | Medium | | High | | | |
|------------|---------|----------|---------|---------|---------|---------|---------|
| 0 | | 6.391304 | | 7 | | | |
| 1 3345065 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 |
| 2 3533624 | 8.N.2.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 |
| 3 3533629 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 |
| 4 3531750 | 8.S.1.1 | 8.S.1.1 | 8.S.1.1 | 8.S.1.1 | 8.S.1.1 | 8.S.1.1 | 8.S.1.1 |
| 5 2177453 | 8.A.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.2.1 |
| 6 2177408 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 |
| 7 2345816 | 8.N.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 |
| 8 2177463 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.2.1 |
| 9 3531487 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 |
| 10 3533636 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 |
| 11 2177452 | 8.N.1.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 |
| 12 3533635 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 | 8.S.2.1 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 3530922 | 8.N.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 |
| 17 2177413 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 |
| 18 3533623 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 |
| 19 2107302 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 |
| 20 3531765 | 8.A.1.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 |
| 21 3531759 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 |
| 22 3531490 | 8.G.1.1 | 8.G.1.1 | 8.G.1.1 | 8.G.1.1 | 8.G.1.1 | 8.G.1.1 | 8.G.1.1 |
| 23 2177460 | 8.A.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.2.1 |
| 24 3531486 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 |
| 25 3531763 | 8.N.1.1 | 8.N.1.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 |
| 26 3531746 | 8.A.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 | 8.N.1.1 |
| 27 2177425 | 8.G.1.2 | 8.G.1.2 | 8.G.1.2 | 8.G.1.2 | 8.G.1.2 | 8.G.1.2 | 8.G.1.2 |
| 28 3531743 | 8.M.1.2 | 8.M.1.2 | 8.M.1.2 | 8.M.1.2 | 8.M.1.2 | 8.M.1.2 | 8.M.1.2 |
| 29 3533625 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 |
| 30 3531761 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 |
| 31 3531483 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.N.2.1 |
| 32 3356849 | 8.M.1.1 | 8.M.1.1 | 8.M.1.1 | 8.M.1.1 | 8.M.1.1 | 8.M.1.1 | 8.M.1.1 |
| 33 3531473 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 |
| 34 3531484 | 8.A.1.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 |
| 35 3541686 | 8.G.2.1 | 8.G.2.1 | 8.G.2.1 | 8.G.2.1 | 8.M.1.1 | 8.M.1.1 | 8.M.1.1 |
| 36 3531477 | 8.A.3.1 | 8.A.3.1 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 |
| 37 3530909 | 8.N.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 | 8.S.2.1 |
| 38 2345821 | 8.A.4.1 | 8.A.4.1 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 |

Table 8.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 8

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 39 2177442 | 8.M.1.2 |
| 40 | | | | | | | |
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 3344902 | 8.G.2.1 | 8.G.2.1 | 8.G.2.1 | 8.G.2.1 | 8.G.2.1 | 8.G.2.1 | 8.M.1.1 |
| 44 3531749 | 8.S.1.1 |
| 45 3531482 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.N.2.1 |
| 46 3531762 | 8.A.1.1 | 8.A.1.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 |
| 47 3531744 | 8.M.1.2 |
| 48 2177407 | 8.A.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.4.2 | 8.A.4.2 | 8.N.1.1 |
| 49 2345818 | 8.N.1.1 |
| 50 3531753 | 8.S.1.2 |
| 51 3345061 | 8.A.1.1 |
| 52 3531489 | 8.A.2.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.4.2 | 8.A.4.2 |
| 53 2177432 | 8.M.1.2 |
| 54 3348342 | 8.G.2.1 |
| 55 3332350 | 8.A.4.1 |
| 56 3533619 | 8.N.1.1 |
| 57 3332362 | 8.G.2.1 | 8.G.2.1 | 8.G.2.1 | 8.G.2.1 | 8.M.1.1 | 8.M.1.1 | 8.M.1.1 |
| 58 3537650 | 8.A.1.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 | 8.A.2.1 |
| 59 3533637 | 8.S.2.1 |
| 60 3533626 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.3.1 |
| 61 3531479 | 8.A.3.1 | 8.A.3.1 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 |
| 62 3533639 | 8.S.2.1 |
| 63 3533628 | 8.G.2.1 | 8.G.2.1 | 8.G.2.1 | 8.G.2.1 | 8.M.1.1 | 8.M.1.1 | 8.M.1.1 |
| 64 3531757 | 8.S.2.1 |
| 65 3531760 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.2.1 | 8.N.3.1 | 8.N.3.1 |
| 66 3332356 | 8.G.1.1 |
| 67 3531470 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.3.1 | 8.A.4.2 |
| 68 3531481 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.A.1.1 | 8.A.2.1 |
| 69 3332353 | 8.A.4.1 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 |
| 70 3531493 | 8.G.2.1 | 8.G.2.1 | 8.M.1.1 | 8.M.1.1 | 8.M.1.1 | 8.M.1.1 | 8.M.1.1 |
| 71 3533631 | 8.S.1.1 | 8.S.1.1 | 8.S.1.1 | 8.S.1.1 | 8.S.1.1 | 8.S.1.1 | 8.S.1.2 |
| 72 3531491 | 8.G.1.1 |
| 73 3531474 | 8.G.1.2 |
| 74 3533615 | 8.M.1.2 |
| 75 2345824 | 8.N.2.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 |
| 76 3531471 | 8.A.3.1 |
| 77 3344901 | 8.A.1.1 |
| 78 3332359 | 8.G.1.2 |
| 79 3533621 | 8.N.1.1 |
| 80 3531752 | 8.A.4.2 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 | 8.S.1.2 |

Table 8.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 8

| | | | | | | | |
|------------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 3533618 | 8.M.1.2 |
| 84 3531485 | 8.A.2.1 |
| 85 3345068 | 8.A.1.1 |
| 86 3533627 | 8.N.3.1 |
| 87 3345073 | 8.G.2.1 |
| 88 2177466 | 8.A.4.1 | 8.A.4.1 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 | 8.A.4.2 |
| 89 2177414 | 8.N.2.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 | 8.N.3.1 |
| 90 3531480 | 8.A.1.1 |
| 91 2177418 | 8.A.3.1 |
| 92 3531475 | 8.G.1.2 |

Table 8.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 8

| | | | | |
|-----|--|----------|--|------|
| Low | | Medium | | High |
| 0 | | 17.29412 | | 55 |

| | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.A | | | | | | | | | | | | | | | | | | | |
| 8.A.1 | 4 | | | | | | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | | | | | | |
| 8.A.1.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2 | 2 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | | | | | | | 0 | 3 | 6 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 6 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 |
| | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | |
| | 7 | 7 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 8.A.2 | | | | | | | | | | | | | | | | | | | |
| 8.A.2.1 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| | | | | | | | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 4 | 4 | 4 | 4 | 4 |
| | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 5 |
| | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 8 | 8 | 8 | 2 | 8 | 8 |
| | 5 | 5 | 5 | 5 | 6 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | |
| | 8 | 8 | 8 | 8 | 8 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | |
| 8.A.3 | | | | | | | | | | | | | | | | | | | |
| 8.A.3.1 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 |
| | | | | | | | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 6 | 2 | 2 | 2 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | 9 | 9 | 9 |
| | 1 | 1 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 1 | 1 | 1 | 1 |
| | 9 | 9 | 9 | | | | | | | | | | | | | | | | |
| | 1 | 1 | 1 | | | | | | | | | | | | | | | | |
| 8.A.4 | | | | | | | | | | | | | | | | | | | |
| 8.A.4.1 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 8 | 8 | | | | | | | |
| | 8 | 8 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 9 | 8 | 8 | | | | | | | |
| 8.A.4.2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 5 |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 6 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 8 | 8 | 2 |
| | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 2 | 1 | 1 | 1 | 1 | 1 | 7 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 8 | 8 | 8 | 8 | 8 |
| 8.G | | | | | | | | | | | | | | | | | | | |
| 8.G.1 | | | | | | | | | | | | | | | | | | | |
| 8.G.1.1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 2 | 2 |
| | 7 | | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | | |
| 8.G.1.2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 8 | 8 | 8 | 8 | 8 |

Table 8.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 8

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 7 8 | 9 2 | | | | |
| 8.G.2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.G.2.1 | 3 5 | 3 5 | 3 5 | 3 5 | 3 5 | 4 3 | 5 4 | 5 4 | 5 4 | 5 4 | 5 4 | 5 4 | 5 7 | 5 7 | 5 7 | | |
| | 5 7 | 6 3 | 6 3 | 6 3 | 6 3 | 7 0 | 7 0 | 8 7 | | | |
| 8.M | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.M.1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.M.1.1 | 3 2 | 4 3 | 5 7 | 5 7 | 5 7 | 5 7 | 6 3 | 6 3 | 6 3 | 7 0 | 7 0 | 7 0 |
| | 7 0 | 7 0 | | | | | | | | | | | | | | | | | | | | | | |
| 8.M.1.2 | 2 8 | 3 9 | 4 7 | 4 7 | 4 7 | 4 7 | 4 7 | 4 7 |
| | 4 7 | 5 3 | 7 4 | 8 3 | 8 3 | 8 3 | 8 3 | 8 3 | 8 3 |
| | 8 3 | 8 3 | 8 3 | | | | | | | | | | | | | | | | | | | | | |
| 8.N | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.N.1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.N.1.1 | 5 | 5 | 5 | 5 | 5 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 1 1 | 2 3 | 2 3 | 2 3 | 2 3 | 2 3 | 2 3 | 2 5 | 2 5 | 2 5 | 2 6 | |
| | 2 6 | 2 6 | 2 6 | 2 6 | 2 6 | 4 8 | 4 9 | 5 6 | 5 6 | 5 6 | 5 6 | 5 6 | |
| | 5 6 | 7 9 | | | | | | | | | | | | | | | |
| 8.N.2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.N.2.1 | 2 | 5 | 7 | 8 | 1 1 | 1 6 | 1 8 | 1 8 | 1 8 | 1 8 | 1 8 | 2 0 | 2 0 | 2 0 | 2 0 | 2 0 | |
| | 2 0 | 2 3 | 2 5 | 2 5 | 2 5 | 2 5 | 2 5 | 2 5 | 3 0 | 4 1 | 4 7 | 4 5 | 4 6 | 4 6 | |
| | 4 6 | 4 6 | 4 6 | 6 0 | 6 5 | 7 5 | 8 9 | | | | |
| 8.N.3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.N.3.1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 8 | 1 8 | 1 8 | 2 1 | 2 1 | 2 1 | 2 1 | 2 1 | | |
| | 2 1 | 2 1 | 2 1 | 6 0 | 6 5 | 6 5 | 7 5 | 8 6 | | |
| | 8 9 | 8 9 | 8 9 | 8 9 | 8 9 | 8 9 | | | | | | | | | | | | | | | | | | |
| 8.S | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.S.1 | | | | | | | | | | | | | | | | | | | | | | | | |

Table 8.10
Items Coded by Reviewers to Each Objective
South Dakota Mathematics 2008 Grade 8

| | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.S.1.1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | 7 | 7 |
| | | | | | | | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 1 | 1 | 1 | 1 | 1 | 1 |
| 8.S.1.2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | |
| | 1 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| 8.S.2 | | | | | | | | | | | | | | | | | | | | |
| 8.S.2.1 | 7 | 7 | 7 | 7 | 7 | 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 7 | 7 | 7 | 7 | 7 | 7 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | | | |

Table 8.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 8

| Low | | Medium | | High |
|---------|------|--------|------|------|
| 1 | | 3 | | 7 |
| 8.A | | | | |
| 8.A.1 | 48:1 | | | |
| 8.A.1.1 | 1:7 | 5:1 | 20:1 | 23:1 |
| | 26:1 | 34:1 | 45:6 | 46:2 |
| | 51:7 | 58:1 | 68:6 | 77:7 |
| | 85:7 | | | |
| | 90:7 | | | |
| 8.A.2 | | | | |
| 8.A.2.1 | 9:7 | 17:7 | 24:7 | 31:6 |
| | 34:6 | 48:3 | 52:1 | 58:6 |
| | 68:1 | 84:7 | | |
| 8.A.3 | | | | |
| 8.A.3.1 | 6:7 | 33:7 | 36:2 | 52:4 |
| | 61:2 | 67:6 | 76:7 | 91:7 |
| 8.A.4 | | | | |
| 8.A.4.1 | 38:2 | 55:7 | 69:1 | 88:2 |
| 8.A.4.2 | 19:7 | 36:5 | 38:5 | 48:2 |
| | 52:2 | 61:5 | 67:1 | 69:6 |
| | 80:1 | 88:5 | | |
| 8.G | | | | |
| 8.G.1 | | | | |
| 8.G.1.1 | 22:7 | 66:7 | 72:7 | |
| 8.G.1.2 | 27:7 | 73:7 | 78:7 | 92:7 |
| 8.G.2 | | | | |
| 8.G.2.1 | 35:4 | 43:6 | 54:7 | 57:4 |
| | 63:4 | 70:2 | 87:7 | |
| 8.M | | | | |
| 8.M.1 | | | | |
| 8.M.1.1 | 32:7 | 35:3 | 43:1 | 57:3 |
| | 63:3 | 70:5 | | |
| 8.M.1.2 | 28:7 | 39:7 | 47:7 | 53:7 |
| | 74:7 | 83:7 | | |
| 8.N | | | | |
| 8.N.1 | | | | |
| 8.N.1.1 | 5:5 | 8:6 | 11:1 | 23:5 |
| | 25:2 | 26:6 | 48:1 | 49:7 |
| | 56:7 | 79:7 | | |
| 8.N.2 | | | | |
| 8.N.2.1 | 2:1 | 5:1 | 7:1 | 8:1 |
| | 11:6 | 16:1 | 18:4 | 20:6 |
| | 23:1 | 25:5 | 30:7 | 31:1 |
| | 37:1 | | | |
| | 45:1 | 46:5 | 60:6 | 65:5 |
| | 75:1 | 89:1 | | |
| 8.N.3 | | | | |
| 8.N.3.1 | 2:6 | 3:7 | 18:3 | 21:7 |
| | 60:1 | 65:2 | 75:6 | 86:7 |
| | 89:6 | | | |
| 8.S | | | | |
| 8.S.1 | | | | |
| 8.S.1.1 | 4:7 | 44:7 | 71:6 | |
| 8.S.1.2 | 12:6 | 29:7 | 50:7 | 71:1 |
| | 80:6 | | | |
| 8.S.2 | | | | |
| 8.S.2.1 | 7:6 | 10:7 | 12:1 | 16:6 |
| | 37:6 | 59:7 | 62:7 | 64:7 |

Table 8.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 8

| Low | | Medium | | High |
|-----|--|--------|--|------|
| 1 | | 3 | | 7 |

| | | | |
|------------|-----------|-----------|-----------|
| 1 3345065 | 8.A.1.1:7 | | |
| 2 3533624 | 8.N.2.1:1 | 8.N.3.1:6 | |
| 3 3533629 | 8.N.3.1:7 | | |
| 4 3531750 | 8.S.1.1:7 | | |
| 5 2177453 | 8.A.1.1:1 | 8.N.1.1:5 | 8.N.2.1:1 |
| 6 2177408 | 8.A.3.1:7 | | |
| 7 2345816 | 8.N.2.1:1 | 8.S.2.1:6 | |
| 8 2177463 | 8.N.1.1:6 | 8.N.2.1:1 | |
| 9 3531487 | 8.A.2.1:7 | | |
| 10 3533636 | 8.S.2.1:7 | | |
| 11 2177452 | 8.N.1.1:1 | 8.N.2.1:6 | |
| 12 3533635 | 8.S.1.2:6 | 8.S.2.1:1 | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 3530922 | 8.N.2.1:1 | 8.S.2.1:6 | |
| 17 2177413 | 8.A.2.1:7 | | |
| 18 3533623 | 8.N.2.1:4 | 8.N.3.1:3 | |
| 19 2107302 | 8.A.4.2:7 | | |
| 20 3531765 | 8.A.1.1:1 | 8.N.2.1:6 | |
| 21 3531759 | 8.N.3.1:7 | | |
| 22 3531490 | 8.G.1.1:7 | | |
| 23 2177460 | 8.A.1.1:1 | 8.N.1.1:5 | 8.N.2.1:1 |
| 24 3531486 | 8.A.2.1:7 | | |
| 25 3531763 | 8.N.1.1:2 | 8.N.2.1:5 | |
| 26 3531746 | 8.A.1.1:1 | 8.N.1.1:6 | |
| 27 2177425 | 8.G.1.2:7 | | |
| 28 3531743 | 8.M.1.2:7 | | |
| 29 3533625 | 8.S.1.2:7 | | |
| 30 3531761 | 8.N.2.1:7 | | |
| 31 3531483 | 8.A.2.1:6 | 8.N.2.1:1 | |
| 32 3356849 | 8.M.1.1:7 | | |
| 33 3531473 | 8.A.3.1:7 | | |
| 34 3531484 | 8.A.1.1:1 | 8.A.2.1:6 | |
| 35 3541686 | 8.G.2.1:4 | 8.M.1.1:3 | |
| 36 3531477 | 8.A.3.1:2 | 8.A.4.2:5 | |
| 37 3530909 | 8.N.2.1:1 | 8.S.2.1:6 | |
| 38 2345821 | 8.A.4.1:2 | 8.A.4.2:5 | |

Table 8.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 8

| | | | | |
|------------|-----------|-----------|-----------|-----------|
| 39 2177442 | 8.M.1.2:7 | | | |
| 40 | | | | |
| 41 | | | | |
| 42 | | | | |
| 43 3344902 | 8.G.2.1:6 | 8.M.1.1:1 | | |
| 44 3531749 | 8.S.1.1:7 | | | |
| 45 3531482 | 8.A.1.1:6 | 8.N.2.1:1 | | |
| 46 3531762 | 8.A.1.1:2 | 8.N.2.1:5 | | |
| 47 3531744 | 8.M.1.2:7 | | | |
| 48 2177407 | 8.A.1.1 | 8.A.2.1:3 | 8.A.4.2:2 | 8.N.1.1:1 |
| 49 2345818 | 8.N.1.1:7 | | | |
| 50 3531753 | 8.S.1.2:7 | | | |
| 51 3345061 | 8.A.1.1:7 | | | |
| 52 3531489 | 8.A.2.1:1 | 8.A.3.1:4 | 8.A.4.2:2 | |
| 53 2177432 | 8.M.1.2:7 | | | |
| 54 3348342 | 8.G.2.1:7 | | | |
| 55 3332350 | 8.A.4.1:7 | | | |
| 56 3533619 | 8.N.1.1:7 | | | |
| 57 3332362 | 8.G.2.1:4 | 8.M.1.1:3 | | |
| 58 3537650 | 8.A.1.1:1 | 8.A.2.1:6 | | |
| 59 3533637 | 8.S.2.1:7 | | | |
| 60 3533626 | 8.N.2.1:6 | 8.N.3.1:1 | | |
| 61 3531479 | 8.A.3.1:2 | 8.A.4.2:5 | | |
| 62 3533639 | 8.S.2.1:7 | | | |
| 63 3533628 | 8.G.2.1:4 | 8.M.1.1:3 | | |
| 64 3531757 | 8.S.2.1:7 | | | |
| 65 3531760 | 8.N.2.1:5 | 8.N.3.1:2 | | |
| 66 3332356 | 8.G.1.1:7 | | | |
| 67 3531470 | 8.A.3.1:6 | 8.A.4.2:1 | | |
| 68 3531481 | 8.A.1.1:6 | 8.A.2.1:1 | | |
| 69 3332353 | 8.A.4.1:1 | 8.A.4.2:6 | | |
| 70 3531493 | 8.G.2.1:2 | 8.M.1.1:5 | | |
| 71 3533631 | 8.S.1.1:6 | 8.S.1.2:1 | | |
| 72 3531491 | 8.G.1.1:7 | | | |
| 73 3531474 | 8.G.1.2:7 | | | |
| 74 3533615 | 8.M.1.2:7 | | | |
| 75 2345824 | 8.N.2.1:1 | 8.N.3.1:6 | | |
| 76 3531471 | 8.A.3.1:7 | | | |
| 77 3344901 | 8.A.1.1:7 | | | |
| 78 3332359 | 8.G.1.2:7 | | | |
| 79 3533621 | 8.N.1.1:7 | | | |
| 80 3531752 | 8.A.4.2:1 | 8.S.1.2:6 | | |

Table 8.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
South Dakota Mathematics 2008 Grade 8

| | | |
|------------|-----------|-----------|
| 81 | | |
| 82 | | |
| 83 3533618 | 8.M.1.2:7 | |
| 84 3531485 | 8.A.2.1:7 | |
| 85 3345068 | 8.A.1.1:7 | |
| 86 3533627 | 8.N.3.1:7 | |
| 87 3345073 | 8.G.2.1:7 | |
| 88 2177466 | 8.A.4.1:2 | 8.A.4.2:5 |
| 89 2177414 | 8.N.2.1:1 | 8.N.3.1:6 |
| 90 3531480 | 8.A.1.1:7 | |
| 91 2177418 | 8.A.3.1:7 | |
| 92 3531475 | 8.G.1.2:7 | |

Table 8.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 8

| | | | | | | | | | |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|-------------|--|
| [2]: |] |] | 3] | 6] | | | | 4] | |
| 8.S. [2]: | | | | | | | | | |
| 8.S. 1 [2]: | | | | | | | | | |
| 8.S. 1.1 [1]: | 4:7[2] | 44:7 [2] | 71:6 [1.1 7] | | | | | | |
| 8.S. 1.2 [2]: | 12:6 [1.8 3] | 29:7 [1.8 6] | 50:7 [1.8 6] | 71:1 [2] | 80:6 [1.8 3] | | | | |
| 8.S. 2 [2]: | | | | | | | | | |
| 8.S. 2.1 [2]: | 7:6[1.67] | 10:7 [1.7 1] | 12:1 [2] | 16:6 [1.8 3] | 37:6 [2] | 59:7 [1.5 7] | 62:7 [2] | 64:7 [2] | |

Table 11.1
Categorical Concurrence Between Standards and Assessment as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 11
Number of Assessment Items - 84

| Standards | | | Level by Objective | | | Hits | | Cat. Concurr. |
|-------------------------------------|---------|--------|--------------------|--------------------|---------------------|-------|------|---------------|
| Title | Goals # | Objs # | Level | # of objs by Level | % w/in std by Level | Mean | S.D. | |
| 9-12.A - ALGEBRA | 4 | 6.86 | 1 2 | 2 4 | 33 66 | 28.14 | 1.12 | YES |
| 9-12.G - GEOMETRY | 2 | 5 | 1 2 | 1 4 | 20 80 | 14 | 0.93 | YES |
| 9-12.M - MEASUREMENT | 1 | 3.29 | 1 2 | 2 1 | 66 33 | 6.57 | 0.73 | YES |
| 9-12.N - NUMBER SENSE | 3 | 5.14 | 1 2 3 | 3 1 1 | 60 20 20 | 21.57 | 1.92 | YES |
| 9-12.S - STATISTICS AND PROBABILITY | 2 | 5.43 | 1 2 3 | 1 2 2 | 20 40 40 | 13.71 | 0.45 | YES |
| Total | 12 | 25.71 | 1 2 3 | 9 12 3 | 37 50 12 | 84 | 0 | |

Table 11.2a

Alternate Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Seven Reviewers (Does Not Assume Each Objective Should Have Equal Representation)

South Dakota Mathematics 2008 Grade 11

Number of Assessment Items - 84

| Standards | | | Hits | | Level of Item w.r.t. Standard | | | | | | DOK Consistency |
|-------------------------------------|---------|--------|-------|------|-------------------------------|------|------|------|---------|------|-----------------|
| | | | | | % Under | | % At | | % Above | | |
| Title | Goals # | Objs # | M | S.D. | M | S.D. | M | S.D. | M | S.D. | |
| 9-12.A - ALGEBRA | 4 | 6.86 | 28.14 | 1.12 | 56 | 289 | 38 | 36 | 6 | 20 | WEAK |
| 9-12.G - GEOMETRY | 2 | 5 | 14 | 0.93 | 40 | 133 | 58 | 36 | 2 | 17 | YES |
| 9-12.M - MEASUREMENT | 1 | 3.29 | 6.57 | 0.73 | 28 | 116 | 42 | 34 | 30 | 41 | YES |
| 9-12.N - NUMBER SENSE | 3 | 5.14 | 21.57 | 1.92 | 17 | 150 | 66 | 37 | 18 | 23 | YES |
| 9-12.S - STATISTICS AND PROBABILITY | 2 | 5.43 | 13.71 | 0.45 | 54 | 170 | 45 | 42 | 1 | 16 | WEAK |
| Total | 12 | 25.71 | 84 | 0 | 41 | 42 | 49 | 39 | 10 | 25 | |

Table 11.3

Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Seven Reviewers

South Dakota Mathematics 2008 Grade 11

Number of Assessment Items - 84

| Standards | | | Hits | | Range of Objectives | | | | Rng. of Know. | Balance Index | | | | Bal. of Represent. |
|-------------------------------------|---------|--------|-------|------|---------------------|------|------------|------|---------------|------------------------|------|-------|------|--------------------|
| | | | | | # Objs Hit | | % of Total | | | % Hits in Std/Ttl Hits | | Index | | |
| Title | Goals # | Objs # | Mean | S.D. | Mean | S.D. | Mean | S.D. | | Mean | S.D. | Mean | S.D. | |
| 9-12.A - ALGEBRA | 4 | 6.86 | 28.14 | 1.12 | 6.86 | 0.35 | 100 | 0 | YES | 34 | 1 | 0.81 | 0.07 | YES |
| 9-12.G - GEOMETRY | 2 | 5 | 14 | 0.93 | 5 | 0 | 100 | 0 | YES | 17 | 1 | 0.88 | 0.01 | YES |
| 9-12.M - MEASUREMENT | 1 | 3.29 | 6.57 | 0.73 | 2.71 | 0.88 | 81 | 16 | YES | 8 | 1 | 0.92 | 0.08 | YES |
| 9-12.N - NUMBER SENSE | 3 | 5.14 | 21.57 | 1.92 | 5 | 0.53 | 97 | 7 | YES | 26 | 2 | 0.71 | 0.09 | YES |
| 9-12.S - STATISTICS AND PROBABILITY | 2 | 5.43 | 13.71 | 0.45 | 5.14 | 0.64 | 95 | 8 | YES | 16 | 1 | 0.69 | 0.05 | WEAK |
| Total | 12 | 25.71 | 84 | 0 | 4.94 | 1.43 | 95 | 11 | | 20 | 9 | 0.80 | 0.11 | |

Table 11.4

Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria as Rated by Seven Reviewers
South Dakota Mathematics 2008 Grade 11
Number of Assessment Items - 84

| Standards | Alignment Criteria | | | |
|-------------------------------------|-------------------------|--------------------------------|--------------------|---------------------------|
| | Categorical Concurrence | Depth-of-Knowledge Consistency | Range of Knowledge | Balance of Representation |
| 9-12.A - ALGEBRA | YES | WEAK | YES | YES |
| 9-12.G - GEOMETRY | YES | YES | YES | YES |
| 9-12.M - MEASUREMENT | YES | YES | YES | YES |
| 9-12.N - NUMBER SENSE | YES | YES | YES | YES |
| 9-12.S - STATISTICS AND PROBABILITY | YES | WEAK | YES | WEAK |

Table 11.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 11

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| 4 | 2 | 2 | 2 | 1 | 1 | 1 | 2 |
| 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 6 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| 7 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 8 | 2 | 2 | 1 | 1 | 1 | 2 | 1 |
| 9 | 1 | 2 | 1 | 2 | 2 | 2 | 1 |
| 10 | 2 | 2 | 1 | 2 | 2 | 1 | 1 |
| 11 | 1 | 2 | 1 | 1 | 1 | 2 | 1 |
| 12 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| 17 | 1 | 2 | 2 | 1 | 2 | 1 | 2 |
| 18 | 1 | 1 | 1 | 2 | 2 | 1 | 2 |
| 19 | 1 | 1 | 1 | 1 | 2 | 2 | 1 |
| 20 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 21 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 22 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| 23 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 24 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 25 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| 26 | 1 | 2 | 2 | 1 | 1 | 2 | 1 |
| 27 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 28 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 29 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| 30 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| 31 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 32 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 33 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 34 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 35 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 36 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 37 | 1 | 1 | 2 | 1 | 2 | 1 | 2 |
| 38 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| 39 | 1 | 1 | 1 | 1 | 2 | 2 | 1 |
| 40 | | | | | | | |

Table 11.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 11

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 | 2 | 2 | 2 | 1 | 2 | 2 | 1 |
| 44 | 1 | 1 | 2 | 1 | 2 | 1 | 2 |
| 45 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 46 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 47 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 48 | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| 49 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| 50 | 1 | 1 | 1 | 2 | 2 | 2 | 1 |
| 51 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| 52 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| 53 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 54 | 2 | 1 | 1 | 2 | 2 | 1 | 2 |
| 55 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| 56 | 2 | 2 | 1 | 1 | 2 | 2 | 1 |
| 57 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 58 | 2 | 1 | 1 | 1 | 2 | 2 | 1 |
| 59 | 2 | 2 | 2 | 1 | 2 | 2 | 1 |
| 60 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 61 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 62 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 63 | 2 | 2 | 1 | 2 | 1 | 2 | 1 |
| 64 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 65 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| 66 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 67 | 1 | 1 | 2 | 1 | 2 | 2 | 1 |
| 68 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 69 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 70 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 71 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 72 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| 73 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 74 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 75 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 76 | 2 | 1 | 2 | 1 | 2 | 2 | 2 |
| 77 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| 78 | 1 | 1 | 2 | 1 | 2 | 1 | 2 |
| 79 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 80 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

Table 11.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
South Dakota Mathematics 2008 Grade 11

| Item | Rater 1 | Rater 2 | Rater 3 | Rater 4 | Rater 5 | Rater 6 | Rater 7 |
|------|---------|---------|---------|---------|---------|---------|---------|
| 81 | | | | | | | |
| 82 | | | | | | | |
| 83 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| 84 | 1 | 2 | 1 | 1 | 1 | 2 | 1 |
| 85 | 2 | 2 | 1 | 2 | 2 | 3 | 1 |
| 86 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| 87 | 2 | 1 | 1 | 1 | 2 | 1 | 1 |
| 88 | 1 | 1 | 1 | 1 | 2 | 2 | 1 |
| 89 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 90 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| 91 | 2 | 2 | 1 | 1 | 1 | 1 | 2 |
| 92 | 1 | 1 | 1 | 2 | 2 | 1 | 1 |

Intraclass Correlation: 0.8093

Pairwise Comparison: 0.6769

Table 11.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 11

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | S1Obj5 | DOK6 | PObj6 |
|------|------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|--------|------|------------|
| 1 | 1 | 9-12.A.2.2 | 1 | 9-12.A.4.1 | | 1 | 9-12.A.2.2 |
| 2 | 1 | 9-12.A.4.1 | | 1 | 9-12.A.4.1 |
| 3 | 2 | 9-12.M.1.1 | 2 | 9-12.M.1.1 | 1 | 9-12.M.1.1 | 2 | 9-12.M.1.1 | 2 | 9-12.M.1.1 | 2 | 9-12.M.1.1 | | 1 | 9-12.M.1.1 |
| 4 | 2 | 9-12.A.2.2 | 2 | 9-12.A.2.2 | 2 | 9-12.A.2.2 | 1 | 9-12.A.2.2 | 1 | 9-12.A.2.2 | 1 | 9-12.A.2.2 | | 2 | 9-12.A.2.2 |
| 5 | 1 | 9-12.A.1.1 | | 1 | 9-12.A.1.1 |
| 6 | 2 | 9-12.A.2.1 | 2 | 9-12.A.2.1 | 1 | 9-12.A.2.1 | 1 | 9-12.A.2.1 | 2 | 9-12.A.2.1 | 1 | 9-12.A.2.1 | | 1 | 9-12.A.2.1 |
| 7 | 2 | 9-12.A.4.1 | 2 | 9-12.A.4.1 | 2 | 9-12.A.2 | 2 | 9-12.A.2.1 | 2 | 9-12.A.2 | 2 | 9-12.A.3.1 | | 1 | 9-12.A.2 |
| 8 | 2 | 9-12.S.1.2 | 2 | 9-12.S.1.2 | 1 | 9-12.S.1.2 | 1 | 9-12.S.1.2 | 1 | 9-12.S.1.2 | 2 | 9-12.S.1.2 | | 1 | 9-12.S.1.2 |
| 9 | 1 | 9-12.M.1.2 | 2 | 9-12.N.3.2 | 1 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 2 | 9-12.M.1.2 | | 1 | 9-12.N.2.1 |
| 10 | 2 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | 1 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | 1 | 9-12.S.2.2 | | 1 | 9-12.S.2.2 |
| 11 | 1 | 9-12.A.4.1 | 2 | 9-12.A.4.1 | 1 | 9-12.A.4.1 | 1 | 9-12.A.4.1 | 1 | 9-12.A.4.1 | 2 | 9-12.A.4.1 | | 1 | 9-12.A.4.1 |
| 12 | 1 | 9-12.G.1.1 | | 1 | 9-12.G.1.1 |
| 13 | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | |
| 16 | 2 | 9-12.S.1.2 | 2 | 9-12.S.1.2 | 2 | 9-12.S.1.2 | 2 | 9-12.S.1.2 | 1 | 9-12.S.1.1 | 2 | 9-12.S.1.2 | | 1 | 9-12.S.1.1 |
| 17 | 1 | 9-12.G.1.1 | 2 | 9-12.G.1.1 | 2 | 9-12.G.1.1 | 1 | 9-12.G.1.1 | 2 | 9-12.G.1.1 | 1 | 9-12.G.1.1 | | 2 | 9-12.G.1.1 |
| 18 | 1 | 9-12.N.1.2 | 1 | 9-12.N.1.2 | 1 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 1 | 9-12.G.2.1 | | 2 | 9-12.N.2.1 |
| 19 | 1 | 9-12.N.1.2 | 1 | 9-12.N.1.2 | 1 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | | 1 | 9-12.N.2.1 |
| 20 | 1 | 9-12.S.1.2 | 1 | 9-12.S.1.2 | 1 | 9-12.S.1.2 | 1 | 9-12.S.1.2 | 1 | 9-12.S.1.1 | 1 | 9-12.S.1.2 | | 1 | 9-12.S.1.2 |
| 21 | 1 | 9-12.G.1.1 | | 1 | 9-12.G.1.1 |
| 22 | 1 | 9-12.N.1.1 | 2 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 1 | 9-12.A.1.1 | | 1 | 9-12.N.2.1 |
| 23 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3 | | 2 | 9-12.N.3.1 |
| 24 | 1 | 9-12.A.2.1 | 1 | 9-12.A.2.1 | 1 | 9-12.A.2.1 | 1 | 9-12.A.2.1 | 2 | 9-12.A.2.1 | 1 | 9-12.A.2.1 | | 1 | 9-12.A.2.1 |
| 25 | 1 | 9-12.N.1.2 | 2 | 9-12.N.1.2 | | 1 | 9-12.N.1.2 |
| 26 | 1 | 9-12.A.4.1 | 2 | 9-12.A.4.1 | 2 | 9-12.A.4.1 | 1 | 9-12.A.4.1 | 1 | 9-12.A.4.1 | 2 | 9-12.A.4.1 | | 1 | 9-12.A.4.1 |
| 27 | 2 | 9-12.S.1.1 | 2 | 9-12.S.2.2 | 2 | 9-12.S.1.1 | 2 | 9-12.S.1.1 | 2 | 9-12.S.1.1 | 2 | 9-12.S.1.1 | | 2 | 9-12.S.1.1 |
| 28 | 1 | 9-12.A.1.1 | | 1 | 9-12.A.1.1 |
| 29 | 1 | 9-12.M.1.3 | 2 | 9-12.M.1.3 | 1 | 9-12.M.1.3 | 1 | 9-12.M.1.3 | 2 | 9-12.M.1.3 | 1 | 9-12.M.1.3 | | 1 | 9-12.M.1.3 |
| 30 | 2 | 9-12.N.3.1 | 1 | 9-12.N.1.1 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | | 2 | 9-12.N.3.1 |
| 31 | 1 | 9-12.M.1.1 | 1 | 9-12.M.1.2 | 1 | 9-12.M.1.1 | 1 | 9-12.M.1.1 | 1 | 9-12.M.1.1 | 1 | 9-12.M.1.1 | | 1 | 9-12.M.1.1 |

Table 11.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 11

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | S1Obj5 | DOK6 | PObj6 |
|------|------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|--------|------|------------|
| 32 | 2 | 9-12.G.2.1 | | 2 | 9-12.G.2.1 |
| 33 | 1 | 9-12.A.2.1 | 1 | 9-12.A.1.1 | 1 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | 2 | 9-12.A.1.1 | 1 | 9-12.A.1.1 | | 1 | 9-12.A.2.1 |
| 34 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3.2 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | | 1 | 9-12.N.3.1 |
| 35 | 1 | 9-12.A.3.1 | 1 | 9-12.A.3.1 | 1 | 9-12.A.3.1 | 1 | 9-12.A.3.1 | 2 | 9-12.A.3.1 | 1 | 9-12.A.3.1 | | 1 | 9-12.A.3.1 |
| 36 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3.2 | | 1 | 9-12.N.3.1 |
| 37 | 1 | 9-12.A.2.2 | 1 | 9-12.A.2.2 | 2 | 9-12.A.2.2 | 1 | 9-12.A.2.2 | 2 | 9-12.A.2.2 | 1 | 9-12.A.2.2 | | 2 | 9-12.A.2.2 |
| 38 | 2 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | 1 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | | 2 | 9-12.S.2.2 |
| 39 | 1 | 9-12.A.3.1 | 1 | 9-12.A.4.1 | 1 | 9-12.A.3.1 | 1 | 9-12.A.3.1 | 2 | 9-12.A.4.1 | 2 | 9-12.A.3.1 | | 1 | 9-12.A.3.1 |
| 40 | | | | | | | | | | | | | | | |
| 41 | | | | | | | | | | | | | | | |
| 42 | | | | | | | | | | | | | | | |
| 43 | 2 | 9-12.M.1.3 | 2 | 9-12.M.1.3 | 2 | 9-12.M.1.3 | 1 | 9-12.M.1.3 | 2 | 9-12.M.1.3 | 2 | 9-12.M.1.3 | | 1 | 9-12.M.1.3 |
| 44 | 1 | 9-12.N.1.2 | 1 | 9-12.N.1.2 | 2 | 9-12.N.1.2 | 1 | 9-12.N.1.2 | 2 | 9-12.N.1.2 | 1 | 9-12.N.1.2 | | 2 | 9-12.N.1.1 |
| 45 | 1 | 9-12.N.1.1 | | 1 | 9-12.N.1.1 |
| 46 | 2 | 9-12.N.3.1 | | 2 | 9-12.N.3.1 |
| 47 | 1 | 9-12.A.4.1 | 1 | 9-12.A.4.1 | 1 | 9-12.A.4.1 | 1 | 9-12.A.4.1 | 2 | 9-12.A.3.1 | 1 | 9-12.A.4.1 | | 1 | 9-12.A.4.1 |
| 48 | 2 | 9-12.G.2.3 | 2 | 9-12.G.2.3 | 1 | 9-12.G.2.3 | 1 | 9-12.G.2.3 | 2 | 9-12.G.2.3 | 2 | 9-12.G.2.3 | | 1 | 9-12.G.2.3 |
| 49 | 1 | 9-12.S.1.2 | 2 | 9-12.S.1.2 | 1 | 9-12.S.1.2 | 1 | 9-12.S.1.2 | 2 | 9-12.S.1.1 | 1 | 9-12.S.1.2 | | 1 | 9-12.S.1.2 |
| 50 | 1 | 9-12.N.3.2 | 1 | 9-12.N.3.2 | 1 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 2 | 9-12.N.3.2 | | 1 | 9-12.N.2.1 |
| 51 | 2 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | 1 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | 2 | 9-12.S.2 | | 1 | 9-12.S.2.2 |
| 52 | 1 | 9-12.A.1.1 | 1 | 9-12.A.1.1 | 2 | 9-12.A.1.1 | 1 | 9-12.A.1.1 | 1 | 9-12.A.1.1 | 1 | 9-12.A.1.1 | | 1 | 9-12.A.1.1 |
| 53 | 1 | 9-12.G.2.2 | 1 | 9-12.G.2.2 | 1 | 9-12.G.2.2 | 1 | 9-12.G.2.2 | 2 | 9-12.G.2.2 | 1 | 9-12.G.2.2 | | 1 | 9-12.G.2.2 |
| 54 | 2 | 9-12.G.2.3 | 1 | 9-12.G.2.3 | 1 | 9-12.G.2.3 | 2 | 9-12.G.2.3 | 2 | 9-12.G.2.3 | 1 | 9-12.G.2.3 | | 2 | 9-12.G.2.3 |
| 55 | 2 | 9-12.A.3.2 | 2 | 9-12.A.3.2 | 1 | 9-12.A.3.2 | 1 | 9-12.A.3.2 | 2 | 9-12.A.3.2 | 1 | 9-12.A.3.2 | | 1 | 9-12.A.3.2 |
| 56 | 2 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | 1 | 9-12.S.2.2 | 1 | 9-12.S.2.2 | 2 | 9-12.S.2.2 | 2 | 9-12.S.1.1 | | 1 | 9-12.S.2.2 |
| 57 | 1 | 9-12.A.1.1 | 1 | 9-12.A.1 | | 1 | 9-12.A.1.1 |
| 58 | 2 | 9-12.A.3.2 | 1 | 9-12.A.4.1 | 1 | 9-12.A.3.2 | 1 | 9-12.A.3.2 | 2 | 9-12.A.3.2 | 2 | 9-12.A.4.1 | | 1 | 9-12.A.3.2 |
| 59 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | 1 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | 2 | 9-12.G.2.3 | | 1 | 9-12.N.3.1 |
| 60 | 1 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | | 1 | 9-12.N.2.1 |
| 61 | 1 | 9-12.A.4.1 | | 1 | 9-12.A.4.1 |

Table 11.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 11

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | S1Obj5 | DOK6 | PObj6 |
|------|------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|------------|------|------------|
| 62 | 1 | 9-12.A.2.1 | 1 | 9-12.A.2.1 | 1 | 9-12.G.2.3 | 1 | 9-12.G.2.3 | 2 | 9-12.G.2.3 | 1 | 9-12.G.2.3 | | 1 | 9-12.G.2.3 |
| 63 | 2 | 9-12.N.3.2 | 2 | 9-12.N.3.2 | 1 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | 2 | 9-12.M.1.1 | | 1 | 9-12.N.2.1 |
| 64 | 1 | 9-12.A.3 | 1 | 9-12.A.3 | 1 | 9-12.S.1.3 | 1 | 9-12.S.1.3 | 1 | 9-12.S.1.3 | 1 | 9-12.S.1.1 | | 1 | 9-12.S.1.3 |
| 65 | 2 | 9-12.N.3.2 | 2 | 9-12.N.3.2 | 1 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 2 | 9-12.N.3.2 | | 1 | 9-12.N.2.1 |
| 66 | 2 | 9-12.S.1.2 | 1 | 9-12.S.1.2 | | 1 | 9-12.S.1.2 |
| 67 | 1 | 9-12.G.1.2 | 1 | 9-12.G.1.2 | 2 | 9-12.G.1.2 | 1 | 9-12.G.1.2 | 2 | 9-12.G.1.1 | 2 | 9-12.G.1.2 | | 1 | 9-12.G.1.2 |
| 68 | 2 | 9-12.N.1.2 | 2 | 9-12.N.1.2 | 2 | 9-12.A.1.1 | 2 | 9-12.A.1.1 | 2 | 9-12.A.1.1 | 1 | 9-12.A.1.1 | | 2 | 9-12.A.1.1 |
| 69 | 1 | 9-12.N.2.1 | 1 | 9-12.A.1.1 | 1 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | 1 | 9-12.N.2.1 | | 1 | 9-12.N.2.1 |
| 70 | 1 | 9-12.G.2.2 | 1 | 9-12.G.2.2 | 1 | 9-12.G.2.2 | 1 | 9-12.G.2.2 | 2 | 9-12.G.2.2 | 1 | 9-12.G.2.2 | | 1 | 9-12.G.2.2 |
| 71 | 1 | 9-12.M.1.2 | 1 | 9-12.M.1.1 | | 1 | 9-12.M.1.1 |
| 72 | 2 | 9-12.N.1.1 | 2 | 9-12.N.3.2 | 1 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | 2 | 9-12.N.2.1 | | 1 | 9-12.N.2.1 |
| 73 | 1 | 9-12.A.3.2 | | 1 | 9-12.A.3.2 |
| 74 | 2 | 9-12.G.1.2 | | 2 | 9-12.G.1.2 |
| 75 | 1 | 9-12.A.2.2 | | 1 | 9-12.A.2.2 |
| 76 | 2 | 9-12.N.3.1 | 1 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | 1 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | 2 | 9-12.N.3.1 | | 2 | 9-12.N.3.1 |
| 77 | 2 | 9-12.G.1.2 | 2 | 9-12.G.1.2 | 2 | 9-12.G.1.2 | 1 | 9-12.G.1.2 | 2 | 9-12.G.1.2 | 2 | 9-12.G.1.2 | | 2 | 9-12.G.1.2 |
| 78 | 1 | 9-12.A.1.1 | 1 | 9-12.A.1.1 | 2 | 9-12.A.1.1 | 1 | 9-12.A.1.1 | 2 | 9-12.A.1.1 | 1 | 9-12.A.1.1 | | 2 | 9-12.A.1.1 |
| 79 | 1 | 9-12.S.2.1 | 1 | 9-12.S.2.1 | 1 | 9-12.S.2.1 | 1 | 9-12.S.2.1 | 2 | 9-12.S.2.1 | 1 | 9-12.S.2.1 | | 1 | 9-12.S.2.2 |
| 80 | 2 | 9-12.S.1.3 | 2 | 9-12.S.1.3 | 2 | 9-12.S.1.3 | 2 | 9-12.S.1.3 | 2 | 9-12.S.1.1 | 2 | 9-12.S.1.3 | | 2 | 9-12.S.1.3 |
| 81 | | | | | | | | | | | | | | | |
| 82 | | | | | | | | | | | | | | | |
| 83 | 2 | 9-12.G.2.1 | | 1 | 9-12.G.2.1 |
| 84 | 1 | 9-12.A.3.1 | 2 | 9-12.A.4.1 | 1 | 9-12.A.3.1 | 1 | 9-12.A.3.1 | 1 | 9-12.A.3.1 | 2 | 9-12.A.3.1 | | 1 | 9-12.A.3.1 |
| 85 | 2 | 9-12.M.1 | 2 | 9-12.M.1 | 1 | 9-12.M.1.3 | 2 | 9-12.M.1.3 | 2 | 9-12.M.1.3 | 3 | 9-12.M.1.3 | | 1 | 9-12.M.1.3 |
| 86 | 1 | 9-12.N.1.1 | 1 | 9-12.N.1.1 | 1 | 9-12.N.1.1 | 1 | 9-12.N.1.1 | 2 | 9-12.N.1.1 | 1 | 9-12.N.1.1 | | 1 | 9-12.N.1.1 |
| 87 | 2 | 9-12.G.1.2 | 1 | 9-12.G.1.2 | 1 | 9-12.G.1.2 | 1 | 9-12.G.1.2 | 2 | 9-12.G.1.2 | 1 | 9-12.G.1.2 | | 1 | 9-12.G.1.2 |
| 88 | 1 | 9-12.A.1.1 | 1 | 9-12.A.1.1 | 1 | 9-12.A.2.1 | 1 | 9-12.A.2.1 | 2 | 9-12.A.2.1 | 2 | 9-12.A.2.1 | 9-12.A.1.1 | 1 | 9-12.A.2.1 |

Table 11.8
DOK Levels and Objectives Coded by Each Reviewer
South Dakota Mathematics 2008 Grade 11

| Item | DOK0 | PObj0 | DOK1 | PObj1 | DOK2 | PObj2 | DOK3 | PObj3 | DOK4 | PObj4 | DOK5 | PObj5 | S1Obj5 | DOK6 | PObj6 |
|------|------|------------|------|------------|------|------------|------|------------|------|------------|------|------------|--------|------|------------|
| 89 | 1 | 9-12.A.1.1 | 1 | 9-12.A.1.1 | 1 | 9-12.A.2.1 | 1 | 9-12.A.2.1 | 1 | 9-12.M.1.3 | 1 | 9-12.A.1.1 | | 1 | 9-12.A.2.1 |
| 90 | 2 | 9-12.N.3.1 | 1 | 9-12.N.3.1 | | 2 | 9-12.N.3.1 |
| 91 | 2 | 9-12.S.2 | 2 | 9-12.S.2 | 1 | 9-12.S.2.2 | 1 | 9-12.S.2.2 | 1 | 9-12.S.2.2 | 1 | 9-12.S.2.2 | | 2 | 9-12.S.2.2 |
| 92 | 1 | 9-12.A.3.2 | 1 | 9-12.A.3.2 | 1 | 9-12.A.3.2 | 2 | 9-12.A.4.1 | 2 | 9-12.A.4.1 | 1 | | | 1 | 9-12.A.3.2 |

Objective Pairwise Comparison: 0.7834
Standard Pairwise Comparison: 0.9511

Table 11.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 11

| Low | | Medium | | High | | | |
|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 0 | | 6.391304 | | 8 | | | |
| 1 352589 8 | 9- 12.A.2.2 | 9- 12.A.2.2 | 9- 12.A.2.2 | 9- 12.A.2.2 | 9- 12.A.2.2 | 9- 12.A.2.2 | 9- 12.A.4.1 |
| 2 352566 5 | 9- 12.A.4.1 |
| 3 352567 8 | 9- 12.M.1. 1 |
| 4 352565 8 | 9- 12.A.2.2 |
| 5 343012 9 | 9- 12.A.1.1 |
| 6 334497 4 | 9- 12.A.2.1 |
| 7 352589 9 | 9-12.A.2 | 9-12.A.2 | 9-12.A.2 | 9- 12.A.2.1 | 9- 12.A.3.1 | 9- 12.A.4.1 | 9- 12.A.4.1 |
| 8 352569 3 | 9- 12.S.1.2 |
| 9 352568 2 | 9- 12.M.1. 2 | 9- 12.M.1. 2 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.3.2 |
| 10 343015 8 | 9- 12.S.2.2 |
| 11 217752 4 | 9- 12.A.4.1 |
| 12 354783 0 | 9- 12.G.1.1 |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | 9- | 9- | 9- | 9- | 9- | 9- | 9- |

Table 11.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 11

| | | | | | | | |
|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 352591 1 | 12.S.1.1 | 12.S.1.1 | 12.S.1.2 | 12.S.1.2 | 12.S.1.2 | 12.S.1.2 | 12.S.1.2 |
| 17 352588 0 | 9- 12.G.1.1 |
| 18 217751 8 | 9- 12.G.2.1 | 9- 12.N.1.2 | 9- 12.N.1.2 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 |
| 19 334496 7 | 9- 12.N.1.2 | 9- 12.N.1.2 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 |
| 20 352569 4 | 9- 12.S.1.1 | 9- 12.S.1.2 | 9- 12.S.1.2 | 9- 12.S.1.2 | 9- 12.S.1.2 | 9- 12.S.1.2 | 9- 12.S.1.2 |
| 21 354783 1 | 9- 12.G.1.1 |
| 22 352590 7 | 9- 12.A.1.1 | 9- 12.N.1.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 |
| 23 334495 8 | 9-12.N.3 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 |
| 24 352565 7 | 9- 12.A.2.1 |
| 25 352590 6 | 9- 12.N.1.2 |
| 26 217752 5 | 9- 12.A.4.1 |
| 27 352591 6 | 9- 12.S.1.1 | 9- 12.S.1.1 | 9- 12.S.1.1 | 9- 12.S.1.1 | 9- 12.S.1.1 | 9- 12.S.1.1 | 9- 12.S.2.2 |
| 28 352565 3 | 9- 12.A.1.1 |
| 29 352589 3 | 9- 12.M.1. 3 |
| 30 334496 4 | 9- 12.N.1.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 |

Table 11.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 11

| | | | | | | | |
|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 31 352567 9 | 9- 12.M.1. 1 | 9- 12.M.1. 1 | 9- 12.M.1. 1 | 9- 12.M.1. 1 | 9- 12.M.1. 1 | 9- 12.M.1. 1 | 9- 12.M.1. 2 |
| 32 352567 2 | 9- 12.G.2.1 |
| 33 217751 7 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.2.1 | 9- 12.A.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 |
| 34 352591 9 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.2 |
| 35 352566 0 | 9- 12.A.3.1 |
| 36 352590 9 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.2 | 9- 12.N.3.2 | 9- 12.N.3.2 | 9- 12.N.3.2 | 9- 12.N.3.2 |
| 37 334497 7 | 9- 12.A.2.2 |
| 38 352591 5 | 9- 12.S.2.2 |
| 39 217752 9 | 9- 12.A.3.1 | 9- 12.A.3.1 | 9- 12.A.3.1 | 9- 12.A.3.1 | 9- 12.A.3.1 | 9- 12.A.4.1 | 9- 12.A.4.1 |
| 40 | | | | | | | |
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 354106 6 | 9- 12.M.1. 3 |
| 44 354783 5 | 9- 12.N.1.1 | 9- 12.N.1.2 | 9- 12.N.1.2 | 9- 12.N.1.2 | 9- 12.N.1.2 | 9- 12.N.1.2 | 9- 12.N.1.2 |
| 45 354783 6 | 9- 12.N.1.1 |
| 46 352568 7 | 9- 12.N.3.1 |
| 47 352566 | 9- 12.A.3.1 | 9- 12.A.4.1 | 9- 12.A.4.1 | 9- 12.A.4.1 | 9- 12.A.4.1 | 9- 12.A.4.1 | 9- 12.A.4.1 |

Table 11.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 11

| | | | | | | | |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 6 | | | | | | | |
| 48 352588 9 | 9- 12.G.2.3 |
| 49 343014 9 | 9- 12.S.1.1 | 9- 12.S.1.2 | 9- 12.S.1.2 | 9- 12.S.1.2 | 9- 12.S.1.2 | 9- 12.S.1.2 | 9- 12.S.1.2 |
| 50 334496 1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.3.2 | 9- 12.N.3.2 | 9- 12.N.3.2 |
| 51 352591 4 | 9-12.S.2 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 |
| 52 217750 1 | 9- 12.A.1.1 |
| 53 352940 0 | 9- 12.G.2.2 |
| 54 352567 5 | 9- 12.G.2.3 |
| 55 352590 5 | 9- 12.A.3.2 |
| 56 352569 7 | 9- 12.S.1.1 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 |
| 57 352565 6 | 9-12.A.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 |
| 58 343013 4 | 9- 12.A.3.2 | 9- 12.A.3.2 | 9- 12.A.3.2 | 9- 12.A.3.2 | 9- 12.A.3.2 | 9- 12.A.4.1 | 9- 12.A.4.1 |
| 59 334496 3 | 9- 12.G.2.3 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 |
| 60 352590 8 | 9- 12.N.2.1 |
| 61 354783 3 | 9- 12.A.4.1 |
| 62 | 9- | 9- | 9- | 9- | 9- | 9- | 9- |

Table 11.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 11

| | | | | | | | |
|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 352589 1 | 12.A.2.1 | 12.A.2.1 | 12.G.2.3 | 12.G.2.3 | 12.G.2.3 | 12.G.2.3 | 12.G.2.3 |
| 63 352591 7 | 9- 12.M.1. 1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.3.2 | 9- 12.N.3.2 |
| 64 343014 8 | 9-12.A.3 | 9-12.A.3 | 9- 12.S.1.1 | 9- 12.S.1.3 | 9- 12.S.1.3 | 9- 12.S.1.3 | 9- 12.S.1.3 |
| 65 352565 9 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.3.2 | 9- 12.N.3.2 | 9- 12.N.3.2 |
| 66 352591 0 | 9- 12.S.1.2 |
| 67 352588 5 | 9- 12.G.1.1 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 |
| 68 343014 5 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.N.1.2 | 9- 12.N.1.2 |
| 69 352568 6 | 9- 12.A.1.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 |
| 70 352567 4 | 9- 12.G.2.2 |
| 71 352591 8 | 9- 12.M.1. 1 | 9- 12.M.1. 1 | 9- 12.M.1. 1 | 9- 12.M.1. 1 | 9- 12.M.1. 1 | 9- 12.M.1. 1 | 9- 12.M.1. 2 |
| 72 343014 6 | 9- 12.N.1.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.2.1 | 9- 12.N.3.2 |
| 73 352566 3 | 9- 12.A.3.2 |
| 74 352566 8 | 9- 12.G.1.2 |
| 75 354783 2 | 9- 12.A.2.2 |
| 76 217751 9 | 9- 12.N.3.1 |

Table 11.9
Objectives Coded to Each Item by Reviewers
South Dakota Mathematics 2008 Grade 11

| | | | | | | | | |
|-------------------|----------------|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 77 352567 0 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 |
| 78 352565 5 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 |
| 79 352591 3 | 9- 12.S.2.1 | 9- 12.S.2.1 | 9- 12.S.2.1 | 9- 12.S.2.1 | 9- 12.S.2.1 | 9- 12.S.2.1 | 9- 12.S.2.1 | 9- 12.S.2.2 |
| 80 352569 6 | 9- 12.S.1.1 | 9- 12.S.1.3 | 9- 12.S.1.3 | 9- 12.S.1.3 | 9- 12.S.1.3 | 9- 12.S.1.3 | 9- 12.S.1.3 | 9- 12.S.1.3 |
| 81 | | | | | | | | |
| 82 | | | | | | | | |
| 83 352588 4 | 9- 12.G.2.1 | 9- 12.G.2.1 | 9- 12.G.2.1 | 9- 12.G.2.1 | 9- 12.G.2.1 | 9- 12.G.2.1 | 9- 12.G.2.1 | 9- 12.G.2.1 |
| 84 217752 8 | 9- 12.A.3.1 | 9- 12.A.3.1 | 9- 12.A.3.1 | 9- 12.A.3.1 | 9- 12.A.3.1 | 9- 12.A.3.1 | 9- 12.A.3.1 | 9- 12.A.4.1 |
| 85 343014 0 | 9- 12.M.1 | 9- 12.M.1 | 9- 12.M.1. 3 | 9- 12.M.1. 3 | 9- 12.M.1. 3 | 9- 12.M.1. 3 | 9- 12.M.1. 3 | 9- 12.M.1. 3 |
| 86 352568 5 | 9- 12.N.1.1 | 9- 12.N.1.1 | 9- 12.N.1.1 | 9- 12.N.1.1 | 9- 12.N.1.1 | 9- 12.N.1.1 | 9- 12.N.1.1 | 9- 12.N.1.1 |
| 87 352588 3 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 | 9- 12.G.1.2 |
| 88 334497 0 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.2.1 | 9- 12.A.2.1 | 9- 12.A.2.1 | 9- 12.A.2.1 | 9- 12.A.2. 1 |
| 89 217751 6 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.1.1 | 9- 12.A.2.1 | 9- 12.A.2.1 | 9- 12.A.2.1 | 9- 12.A.2.1 | 9- 12.M.1. 3 |
| 90 352568 9 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 | 9- 12.N.3.1 |
| 91 352569 8 | 9-12.S.2 | 9-12.S.2 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 | 9- 12.S.2.2 |
| 92 343013 5 | 9- 12.A.3.2 | 9- 12.A.3.2 | 9- 12.A.3.2 | 9- 12.A.3.2 | 9- 12.A.4.1 | 9- 12.A.4.1 | | |

Table 11.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 11

| | | | | |
|-----|--|--------|--|------|
| Low | | Medium | | High |
| 0 | | 14 | | 50 |

| | | | | | | | | | | | | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| 9-12.A | | | | | | | | | | | | | | | | | | | | | |
| 9-12.A.1 | 5 | | | | | | | | | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | | | | | | | | | |
| 9-12.A.1.1 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 5 | 5 | |
| | | | | | | | | | 2 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 2 | 2 | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | | |
| | 2 | 2 | 2 | 2 | 2 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 8 | 8 | |
| | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | | | | | | | | | |
| 9-12.A.2 | 7 | 7 | 7 | | | | | | | | | | | | | | | | | | |
| | 8 | 8 | 8 | | | | | | | | | | | | | | | | | | |
| 9-12.A.2.1 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 6 | 6 | 8 | |
| | | | | | | | | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 8 | |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | | |
| | 8 | 8 | 8 | 8 | 9 | 9 | 9 | | | | | | | | | | | | | | |
| 9-12.A.2.2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | | | | | | | | | | | | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | | | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | | | | | | | | | | | | |
| 9-12.A.3 | 6 | 6 | | | | | | | | | | | | | | | | | | | |
| | 4 | 4 | | | | | | | | | | | | | | | | | | | |
| 9-12.A.3.1 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 8 | 8 | 8 | 8 | 8 | 8 | |
| | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 9 | 9 | 9 | 9 | 9 | 7 | 4 | 4 | 4 | 4 | 4 | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 8 | 8 | 8 | 8 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | |
| | 9 | 9 | 9 | | | | | | | | | | | | | | | | | | |
| | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | |
| 9-12.A.4 | | | | | | | | | | | | | | | | | | | | | |
| 9-12.A.4.1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | |
| | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 6 | 6 | |
| | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | |

Table 11.10
 Items Coded by Reviewers to Each Objective
 South Dakota Mathematics 2008 Grade 11

| | | | | | | | | | | | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 6 | 6 | 6 | 9 | 9 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 1 | 1 | 1 | 1 | 1 | |
| | 6 | 6 | 8 | 9 | 9 | | | | | | | | | | | | | | | |
| | 1 | 1 | 4 | 2 | 2 | | | | | | | | | | | | | | | |
| 9-12.G | | | | | | | | | | | | | | | | | | | | |
| 9-12.G.1 | | | | | | | | | | | | | | | | | | | | |
| 9-12.G.1.1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 1 | 1 | 1 | 1 | 1 |
| | 2 | 6 | | | | | | | | | | | | | | | | | | |
| | 1 | 7 | | | | | | | | | | | | | | | | | | |
| 9-12.G.1.2 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 7 | 7 | 7 | 7 | 7 | 7 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | | | | | | | | | | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | | |
| 9-12.G.2 | | | | | | | | | | | | | | | | | | | | |
| 9-12.G.2.1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | | | | |
| | 8 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | |
| 9-12.G.2.2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| 9-12.G.2.3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 |
| | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 9 | 2 | 2 | 2 | 2 |
| | | | | | | | | | | | | | | | | | | | | |
| 9-12.M | | | | | | | | | | | | | | | | | | | | |
| 9-12.M.1 | 8 | 8 | | | | | | | | | | | | | | | | | | |
| | 5 | 5 | | | | | | | | | | | | | | | | | | |
| 9-12.M.1.1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 7 | 7 | 7 | 7 | 7 |
| | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 |
| | | | | | | | | | | | | | | | | | | | | |
| 9-12.M.1.2 | 9 | 9 | 3 | 7 | | | | | | | | | | | | | | | | |
| | | | 1 | 1 | | | | | | | | | | | | | | | | |
| 9-12.M.1.3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 8 | 8 | 8 | 8 | 8 | 8 |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 9 |
| | | | | | | | | | | | | | | | | | | | | |
| 9-12.N | | | | | | | | | | | | | | | | | | | | |

Table 11.10
Items Coded by Reviewers to Each Objective
South Dakota Mathematics 2008 Grade 11

| | | | | | | | | | | | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12.S.2 | 1 | 1 | 1 | | | | | | | | | | | | | | | | | |
| 9-12.S.2.1 | 7 | 7 | 7 | 7 | 7 | 7 | | | | | | | | | | | | | | |
| 9-12.S.2.2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 1 | 1 | 1 | 1 | 1 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 9 | 9 | 9 | 9 | 9 | | | | | | | |
| | 1 | 6 | 6 | 6 | 6 | 6 | 6 | 9 | 1 | 1 | 1 | 1 | 1 | | | | | | | |

Table 11.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 11

| Low | | Medium | | High |
|------------|------|--------|------|------|
| 1 | | 3 | | 7 |
| 9-12.A | | | | |
| 9-12.A.1 | 57:1 | | | |
| 9-12.A.1.1 | 5:7 | 22:1 | 28:7 | 33:3 |
| | | | 52:7 | 57:6 |
| | | | 68:5 | 69:1 |
| | | | 78:7 | 88:3 |
| | | | 89:3 | |
| 9-12.A.2 | 7:3 | | | |
| 9-12.A.2.1 | 6:7 | 7:1 | 24:7 | 33:2 |
| | | | 62:2 | 88:5 |
| | | | 89:3 | |
| 9-12.A.2.2 | 1:6 | 4:7 | 37:7 | 75:7 |
| 9-12.A.3 | 64:2 | | | |
| 9-12.A.3.1 | 7:1 | 35:7 | 39:5 | 47:1 |
| | | | 84:6 | |
| 9-12.A.3.2 | 55:7 | 58:5 | 73:7 | 92:4 |
| 9-12.A.4 | | | | |
| 9-12.A.4.1 | 1:1 | 2:7 | 7:2 | 11:7 |
| | | | 26:7 | 39:2 |
| | | | 47:6 | 58:2 |
| | | | 61:7 | 84:1 |
| | | | 92:2 | |
| 9-12.G | | | | |
| 9-12.G.1 | | | | |
| 9-12.G.1.1 | 12:7 | 17:7 | 21:7 | 67:1 |
| 9-12.G.1.2 | 67:6 | 74:7 | 77:7 | 87:7 |
| 9-12.G.2 | | | | |
| 9-12.G.2.1 | 18:1 | 32:7 | 83:7 | |
| 9-12.G.2.2 | 53:7 | 70:7 | | |
| 9-12.G.2.3 | 48:7 | 54:7 | 59:1 | 62:5 |
| 9-12.M | | | | |
| 9-12.M.1 | 85:2 | | | |
| 9-12.M.1.1 | 3:7 | 31:6 | 63:1 | 71:6 |
| 9-12.M.1.2 | 9:2 | 31:1 | 71:1 | |
| 9-12.M.1.3 | 29:7 | 43:7 | 85:5 | 89:1 |
| 9-12.N | | | | |
| 9-12.N.1 | | | | |
| 9-12.N.1.1 | 22:1 | 30:1 | 44:1 | 45:7 |
| | | | 72:1 | 86:7 |
| 9-12.N.1.2 | 18:2 | 19:2 | 25:7 | 44:6 |
| | | | 68:2 | |
| 9-12.N.2 | | | | |
| 9-12.N.2.1 | 9:4 | 18:4 | 19:5 | 22:5 |
| | | | 33:2 | 50:4 |
| | | | 60:7 | 63:4 |
| | | | 65:4 | 69:6 |
| | | | 72:5 | |
| 9-12.N.3 | 23:1 | | | |
| 9-12.N.3.1 | 23:6 | 30:6 | 34:6 | 36:2 |
| | | | 46:7 | 59:6 |
| | | | 76:7 | 90:7 |
| 9-12.N.3.2 | 9:1 | 34:1 | 36:5 | 50:3 |
| | | | 63:2 | 65:3 |
| | | | 72:1 | |
| 9-12.S | | | | |
| 9-12.S.1 | | | | |
| 9-12.S.1.1 | 16:2 | 20:1 | 27:6 | 49:1 |
| | | | 56:1 | 64:1 |
| | | | 80:1 | |
| 9-12.S.1.2 | 8:7 | 16:5 | 20:6 | 49:6 |
| | | | 66:7 | |
| 9-12.S.1.3 | 64:4 | 80:6 | | |

Table 11.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
South Dakota Mathematics 2008 Grade 11

| | | | | | | | |
|------------|------|------|------|------|------|------|------|
| 9-12.S.2 | 51:1 | 91:2 | | | | | |
| 9-12.S.2.1 | 79:6 | | | | | | |
| 9-12.S.2.2 | 10:7 | 27:1 | 38:7 | 51:6 | 56:6 | 79:1 | 91:5 |

Table 11.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 11

| Low | | Medium | | High |
|------------|--------------|--------------|--------------|--------------|
| 1 | | 3 | | 7 |
| 1 3525898 | 9-12.A.2.2:6 | 9-12.A.4.1:1 | | |
| 2 3525665 | 9-12.A.4.1:7 | | | |
| 3 3525678 | 9-12.M.1.1:7 | | | |
| 4 3525658 | 9-12.A.2.2:7 | | | |
| 5 3430129 | 9-12.A.1.1:7 | | | |
| 6 3344974 | 9-12.A.2.1:7 | | | |
| 7 3525899 | 9-12.A.2:3 | 9-12.A.2.1:1 | 9-12.A.3.1:1 | 9-12.A.4.1:2 |
| 8 3525693 | 9-12.S.1.2:7 | | | |
| 9 3525682 | 9-12.M.1.2:2 | 9-12.N.2.1:4 | 9-12.N.3.2:1 | |
| 10 3430158 | 9-12.S.2.2:7 | | | |
| 11 2177524 | 9-12.A.4.1:7 | | | |
| 12 3547830 | 9-12.G.1.1:7 | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 3525911 | 9-12.S.1.1:2 | 9-12.S.1.2:5 | | |
| 17 3525880 | 9-12.G.1.1:7 | | | |
| 18 2177518 | 9-12.G.2.1:1 | 9-12.N.1.2:2 | 9-12.N.2.1:4 | |
| 19 3344967 | 9-12.N.1.2:2 | 9-12.N.2.1:5 | | |
| 20 3525694 | 9-12.S.1.1:1 | 9-12.S.1.2:6 | | |
| 21 3547831 | 9-12.G.1.1:7 | | | |
| 22 3525907 | 9-12.A.1.1:1 | 9-12.N.1.1:1 | 9-12.N.2.1:5 | |
| 23 3344958 | 9-12.N.3:1 | 9-12.N.3.1:6 | | |
| 24 3525657 | 9-12.A.2.1:7 | | | |
| 25 3525906 | 9-12.N.1.2:7 | | | |
| 26 2177525 | 9-12.A.4.1:7 | | | |
| 27 3525916 | 9-12.S.1.1:6 | 9-12.S.2.2:1 | | |
| 28 3525653 | 9-12.A.1.1:7 | | | |
| 29 3525893 | 9-12.M.1.3:7 | | | |
| 30 3344964 | 9-12.N.1.1:1 | 9-12.N.3.1:6 | | |
| 31 3525679 | 9-12.M.1.1:6 | 9-12.M.1.2:1 | | |
| 32 3525672 | 9-12.G.2.1:7 | | | |
| 33 2177517 | 9-12.A.1.1:3 | 9-12.A.2.1:2 | 9-12.N.2.1:2 | |
| 34 3525919 | 9-12.N.3.1:6 | 9-12.N.3.2:1 | | |
| 35 3525660 | 9-12.A.3.1:7 | | | |
| 36 3525909 | 9-12.N.3.1:2 | 9-12.N.3.2:5 | | |
| 37 3344977 | 9-12.A.2.2:7 | | | |
| 38 3525915 | 9-12.S.2.2:7 | | | |

Table 11.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
 South Dakota Mathematics 2008 Grade 11

| | | | |
|------------|--------------|--------------|--------------|
| 39 2177529 | 9-12.A.3.1:5 | 9-12.A.4.1:2 | |
| 40 | | | |
| 41 | | | |
| 42 | | | |
| 43 3541066 | 9-12.M.1.3:7 | | |
| 44 3547835 | 9-12.N.1.1:1 | 9-12.N.1.2:6 | |
| 45 3547836 | 9-12.N.1.1:7 | | |
| 46 3525687 | 9-12.N.3.1:7 | | |
| 47 3525666 | 9-12.A.3.1:1 | 9-12.A.4.1:6 | |
| 48 3525889 | 9-12.G.2.3:7 | | |
| 49 3430149 | 9-12.S.1.1:1 | 9-12.S.1.2:6 | |
| 50 3344961 | 9-12.N.2.1:4 | 9-12.N.3.2:3 | |
| 51 3525914 | 9-12.S.2:1 | 9-12.S.2.2:6 | |
| 52 2177501 | 9-12.A.1.1:7 | | |
| 53 3529400 | 9-12.G.2.2:7 | | |
| 54 3525675 | 9-12.G.2.3:7 | | |
| 55 3525905 | 9-12.A.3.2:7 | | |
| 56 3525697 | 9-12.S.1.1:1 | 9-12.S.2.2:6 | |
| 57 3525656 | 9-12.A.1:1 | 9-12.A.1.1:6 | |
| 58 3430134 | 9-12.A.3.2:5 | 9-12.A.4.1:2 | |
| 59 3344963 | 9-12.G.2.3:1 | 9-12.N.3.1:6 | |
| 60 3525908 | 9-12.N.2.1:7 | | |
| 61 3547833 | 9-12.A.4.1:7 | | |
| 62 3525891 | 9-12.A.2.1:2 | 9-12.G.2.3:5 | |
| 63 3525917 | 9-12.M.1.1:1 | 9-12.N.2.1:4 | 9-12.N.3.2:2 |
| 64 3430148 | 9-12.A.3:2 | 9-12.S.1.1:1 | 9-12.S.1.3:4 |
| 65 3525659 | 9-12.N.2.1:4 | 9-12.N.3.2:3 | |
| 66 3525910 | 9-12.S.1.2:7 | | |
| 67 3525885 | 9-12.G.1.1:1 | 9-12.G.1.2:6 | |
| 68 3430145 | 9-12.A.1.1:5 | 9-12.N.1.2:2 | |
| 69 3525686 | 9-12.A.1.1:1 | 9-12.N.2.1:6 | |
| 70 3525674 | 9-12.G.2.2:7 | | |
| 71 3525918 | 9-12.M.1.1:6 | 9-12.M.1.2:1 | |
| 72 3430146 | 9-12.N.1.1:1 | 9-12.N.2.1:5 | 9-12.N.3.2:1 |
| 73 3525663 | 9-12.A.3.2:7 | | |
| 74 3525668 | 9-12.G.1.2:7 | | |
| 75 3547832 | 9-12.A.2.2:7 | | |
| 76 2177519 | 9-12.N.3.1:7 | | |
| 77 3525670 | 9-12.G.1.2:7 | | |
| 78 3525655 | 9-12.A.1.1:7 | | |
| 79 3525913 | 9-12.S.2.1:6 | 9-12.S.2.2:1 | |
| 80 3525696 | 9-12.S.1.1:1 | 9-12.S.1.3:6 | |

Table 11.12

Number of Reviewers Coding an Objective by Item (Objective: Number of Reviewers)
South Dakota Mathematics 2008 Grade 11

| | | | |
|------------|--------------|--------------|--------------|
| 81 | | | |
| 82 | | | |
| 83 3525884 | 9-12.G.2.1:7 | | |
| 84 2177528 | 9-12.A.3.1:6 | 9-12.A.4.1:1 | |
| 85 3430140 | 9-12.M.1.2 | 9-12.M.1.3:5 | |
| 86 3525685 | 9-12.N.1.1:7 | | |
| 87 3525883 | 9-12.G.1.2:7 | | |
| 88 3344970 | 9-12.A.1.1:3 | 9-12.A.2.1:5 | |
| 89 2177516 | 9-12.A.1.1:3 | 9-12.A.2.1:3 | 9-12.M.1.3:1 |
| 90 3525689 | 9-12.N.3.1:7 | | |
| 91 3525698 | 9-12.S.2.2 | 9-12.S.2.2:5 | |
| 92 3430135 | 9-12.A.3.2:4 | 9-12.A.4.1:2 | |

Table 11.13

Assessment Item DOK vs Consensus DOK (Item Number: Number of Reviewers [Average DOK])

South Dakota Mathematics 2008 Grade 11

| | | | | | | | | |
|--------------------|--------------------|-------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 9-12.N.3.1 [2]: | 23:6 [2] | 30:6 [2] | 34:6 [1.8 3] | 36:2 [1.5] | 46:7 [2] | 59:6 [1.6 7] | 76:7 [1.7 1] | 90:7 [1.8 6] |
| 9-12.N.3.2 [3]: | 9:1 [2] | 34:1 [2] | 36:5 [2] | 50:3 [1.3 3] | 63:2 [2] | 65:3 [2] | 72:1 [2] | |
| 9-12.S.1 [3]: | | | | | | | | |
| 9-12.S.1.1 [3]: | 16:2 [1] | 20:1 [1] | 27:6 [2] | 49:1 [2] | 56:1 [2] | 64:1 [1] | 80:1 [2] | |
| 9-12.S.1.2 [2]: | 8:7 [1.43] | 16:5 [2] | 20:6 [1] | 49:6 [1.1 7] | 66:7 [1.7 1] | | | |
| 9-12.S.1.3 [3]: | 64:4 [1] | 80:6 [2] | | | | | | |
| 9-12.S.2 [2]: | 51:1 [2] | 91:2 [2] | | | | | | |
| 9-12.S.2.1 [1]: | 79:6 [1.1 7] | | | | | | | |
| 9-12.S.2.2 [2]: | 10:7 [1.5 7] | 27:1 [2] | 38:7 [1.8 6] | 51:6 [1.6 7] | 56:6 [1.5] | 79:1 [1] | 91:5 [1.2] | |

Appendix C

Reviewers' Notes and Source of Challenge Comments

**South Dakota
Grades 3-8 and 11
Mathematics
2008**

Brief Explanation of Data in the Alignment Tables by Column

Tables *grade.5*

Comments made by reviewers on items identified as having a Source-of-Challenge issue by item number.

Tables *grade.7*

All notes made by reviewers on items by item number.

Table 3.5
Source-of-Challenge Issues by Reviewer
South Dakota Mathematics 2008 Grade 3

| Item Number | Comments by Reviewer |
|-------------|--|
| 9 | This item has two correct answers, depending on how the student thinks about the problem. The given pattern (9,18,27,36,45,54) could come from the rule multiply by 9 (answer C) or by adding 9 (answer D). |
| 9 | This problem has two correct answers. A student may continue the pattern by adding 9 or multiplying by nine, for instance 9×1 , 9×2 , etc. |
| 9 | Choice C (multiply by 9) misleads the student. The student may use "multiply by 9" to solve the problem as well, so they might not choose choice D ("add 9"). |
| 9 | This item has two correct answers. You could think of this as multiplying by 9 (multiply the number of the term by 9) or by adding 9 to the previous term. |
| 9 | Multiplying by the number nine could be a possibility. Students can see it as 1×9 , 2×9 , etc. |
| 53 | Children could answer this item by not finding the sum, but by looking only at the larger number on the left of the inequality. There should be a larger number on the right, so you could be certain that they added the numbers. |
| 54 | This item, because of the huge reading amount, is not accessible for many students---the content is almost trivial. |
| 57 | There is no mention of multiples of numbers other than 2, 5, and 10. Not clear that students should know the multiples of 6 even though they are expected to be able to multiply by 6--two different ideas. |

Table 3.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 3

| Item Number | Comments by Reviewer |
|-------------|--|
| 21 | This standard says students will solve money problems using a collection of coins and bills. This item uses a written representation with \$ and decimals to represent the money rather than coins and bills. |
| 21 | The standard states "using a collection of coins and bills." This problem uses dollars and cents but there is no collection. |
| 21 | Students aren't truly using "a collection of coins and bills," which is what the objective states. They are only stating which amount of money has a value between \$0.50 and \$1.00. |
| 21 | This item which is about choosing an amount of money between \$.50 and \$1.00 is not clearly a measurement item, but none of number objectives suggest ordering numbers other than whole numbers |
| 28 | The standard addressing line segments does not include the skills used in this problem--how line segments are named and comparing the lengths of segments using customary naming. |
| 28 | The standard says to identify a line segment. In the problem the students must pick out the longest segment which involves using labels. |
| 28 | The standard says to "identify" line segments, however the question is asking them to determine length and observe labeling in order to solve. |
| 28 | This item, which requires knowing the notation for line segment, and also choosing the longest line segment is beyond the objective that only says to identify a line segment. |
| 28 | The standard says identifying and for this problem they are asking the students for the longest line segment. They are measuring and not identifying. |
| 34 | The objectives are not clear that one identifies the shape by its properties. It can be read that way, but teachers should know which properties at this grade level are important. |
| 35 | All the fraction items are based on one interpretation of a fraction (the ratio meaning---"out of") which is very limiting. There are no part-whole depending upon specific attributes such as area, length, or numerosness. |
| 39 | The emphasis in the problem is on correctly labeling a number line---while all that is required is knowing what two hundreds a given number is between. |
| 54 | This item is too dense, the reading too complex, for students at this grade level. There is too much reading for the simple task of completing a bar graph. Because of the amount of reading, many students might just guess at the answer when they may well know the required math if it were presented more simply and concisely. |
| 54 | This problem requires too much reading for a 3rd grader. It is so dense that many students will not take the time or effort to read through the entire problem consisting of a chart, a graph and three complex sentences. |
| 54 | This item seems to be very wordy and complex. I think a 3rd grader would get lost in the problem before he/she could answer it. |

Table 3.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 3

| Item Number | Comments by Reviewer |
|-------------|--|
| 54 | This question involves entirely too much reading for 3rd grade. It makes the problem inaccessible to the students after spending so much time digesting the information. |
| 54 | This problem provides a lot of information and reading for the student to process at once and the question about drawing a bar seems cumbersome. Is there a way this question could be written more efficiently? |
| 54 | This math problem is so dense for the students. The children won't even attempt this problem and will probably just guess. The problem is too hard and complex for for the third grade. |
| 59 | Note: This is not the usually way multiplication is described--usually it is the number of sets times the number in each set. This is the opposite. |
| 80 | The lines on the picture (designating the highways) within the county lines are distracting and confusing. Students may try to determine which figure is similar to the shape of the highway lines instead of the shape of the entire county. |
| 91 | I am not sure if the question needs the picture, since it gives the information in the problem. The question is talking about yellow and red soccer balls and the soccer balls are shaded light and dark. Since the test isn't in color, it might be better to leave the picture off or talk about white and black soccer balls. |

Table 4.5
Source-of-Challenge Issues by Reviewer
South Dakota Mathematics 2008 Grade 4

| Item Number | Comments by Reviewer |
|-------------|---|
| 2 | This item seems very easy for this grade level. |
| 30 | Students often chose a number in the word problem---in this case they would be correct, but for the wrong reason. NO excuse for using 8 both in the problem and in the answer--poor test construction. |
| 57 | The lengths of the sides in the drawings of the triangles in the answer choices are too similar they could mislead students into making the wrong selection even though they know the mathematics. The only way a student can get the correct answer is by measuring the side lengths, which is not the intent of the item. |
| 57 | This problem uses a triangle and parallelogram to make 4 different figures. The shapes shown in the answers are too similar for students to distinguish the correct answer. |
| 57 | The figures are too similar in size and shape to be able to accurately choose the correct answer. The lengths of the legs are too close in size to test whether or not they understand the concept or simply made a mistake in measuring (which is not what this question is testing). |
| 57 | Item 57 requires student to find a figure among a set of solutions that could be made by a triangle and parallelogram shown in the beginning of the problem. I found two of the options shown to be so close (A & D) that the student could answer with one of two options. thereby |
| 57 | The choices for the answers for this problem are too close together to figure out. The answers are too similar. Students can still know what congruent is and still get the question wrong. |

Table 4.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 4

| Item Number | Comments by Reviewer |
|-------------|--|
| 2 | This item asks students to choose the greatest number from among four three-digit numbers, a skill that is significantly below expectations for this grade level. |
| 2 | This item using numbers from 150 to 375 is too easy for 4th graders. It asks them to choose the greatest number from a list of 4. |
| 2 | This question is too easy for the grade level. The pictures (boxes of paper) aren't needed either, especially considering they have different amounts of paper in them. This might mislead the reader unnecessarily. |
| 2 | Determining which is more in Item No. 2 does not seem to be addressed in the 4th grade standards, although comparing numbers is. |
| 2 | This problem is below grade level expectation. This problem is too simple for third graders. |
| 5 | This item asks students to round a two digit number, a skill not addressed in the standards for this grade level. It is included in the grade three standards, standard 3N31. |
| 5 | This item on rounding 54 to the nearest 10 does not work with the 4th grade test. It is too easy. It is appropriate for the third grade test and would measure objective 3N3.1 |
| 5 | This item on rounding does not fit on the 4th grade standards. It corresponds with 3.n.3.1 on the 3rd grade standards. |
| 5 | This item is more appropriate for standard 3.N.3.1 (rounding 2-digit whole numbers to the nearest ten). |
| 5 | There is estimation in the 4th grade standards but this item which addresses rounding to the nearest 10 is a 3rd grade standard. |
| 5 | This item fits the grade 3 objectives (3.N3.1) but not the grade 4. |
| 5 | This question is perfect for third grade 3.N.3.1. This question has no standard in 4th grade. |
| 6 | The standard for this grade level restricts students comparison of fractions to fourths, halves, and thirds. This item asks students to select which fraction from the fractions $\frac{1}{2}$, $\frac{2}{5}$, $\frac{9}{10}$, and $\frac{3}{8}$ is closest to 1. Students might not have had the opportunity to work with fractions with those denominators. |
| 6 | The standard is specific stating fractions fourths, halves, and thirds. This problem requires students to use fifths, eighths, and tenths. |
| 6 | These fractions used on this problem are beyond the scope of the standard which only refers to half, quarters, and thirds. |
| 6 | The fractions are beyond the limitations of the standard. The standard is supposed to be $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ only and this question has $\frac{2}{5}$, $\frac{9}{10}$ and $\frac{3}{8}$. |
| 6 | The fractions of item 6 are beyond the expectations of the 4th grade standards which are limited to fourths, halves and thirds.) |
| 6 | The fractions are beyond the limits of the standard. The standard is to use $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{1}{3}$ and the problem is using $\frac{3}{8}$, $\frac{2}{5}$ and $\frac{9}{10}$. |

Table 4.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 4

| Item Number | Comments by Reviewer |
|-------------|---|
| 11 | The objective is not a clear match unless scaling also means knowing the measurement equivalences for capacity, etc. |
| 12 | This item asks students to figure out from among the choices which number is divisible by 5. The topic of divisibility does not appear in the standards at this grade level. |
| 12 | This problem requires knowledge of number characteristics such as odd, even, and divisibility rules. There is not a standard that addresses these number characteristics. |
| 12 | This item is about number properties, (odd, even, divisibility) not covered in the standards. |
| 12 | This question is about number properties (odd/even numbers, divisibility, number of digits), which is not covered by a standard in 4th grade. |
| 12 | This problem requires their knowledge of the word divisibility. |
| 12 | There is no objective that mentions number properties such as odd/even or divisibility. |
| 12 | This problem is about number characteristics. The problem is about odd and even and it isn't addressed in the specific standard. |
| 19 | Because this problem is about CD's, it seems a bit confusing to have one of the store names be CDs Galore. Changing that store name might make simplify the reading task a bit for students. |
| 33 | This item uses prism, the objective only includes triangular prism. Have students had the opportunity to learn word--should not be used as a distractor. |
| 36 | The standard that best fits this item asks students to write number sentences. This item includes only numeric expressions. To better match the standard, each expression could be changed to a number sentence without affecting the content being assessed. |
| 36 | This on on using subtraction embedded in a story problem doesn't fit any of the objectives very well. This seemed like the best fit but I don't think it does a good job of assessing the standard that asks for student to relate the concepts of addition and subtraction. |
| 36 | This standard (4.A.3.1) states that students are to write and solve number sentences, however the problem doesn't truly give "number sentences" for answer choices. It gives choices such as $389 + 14$ instead. However, the question fits everything else in that standard. |
| 36 | Although this would fit under standard 4.A.3.1, $389 + 14$, and the other examples in the problem are not number sentences as described in the standard. |
| 36 | Technically this does not fit since the item involves an expression rather than a number sentence or equation. |
| 36 | The standard 4.A.3.1 for this grade is looking for number sentences and the answers given are not in number sentences. This problem takes words and puts them in an expression for the student to choose. |

Table 4.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 4

| Item Number | Comments by Reviewer |
|-------------|---|
| 38 | This item asks students to round two-digit numbers, a skill not addressed at this grade level. It is part of the grade three standards, standard 3N31. |
| 38 | Another problem that is too easy for a 4th grade exam. This codes well with objective 3N31 on the 3rd grade standards. It ask students to round to the nearest 10. |
| 38 | This item does not match the 4th grade standards for rounding. It matches 3.n.3.1 in the 3rd grade standards. |
| 38 | This question would fit better on the 3rd grade test (standard 3.N.3.1), which asks students to round 2-digit numbers to the nearest ten. |
| 38 | Again, Item 38 is a rounding problem which is a 3rd grade standard (3.N.3.1)and not attributable to the 4th grade standards. |
| 38 | This is another example of a grade 3 objective--rounding---same as the last--belongs with 3.N.3.1 |
| 38 | This problem does not fit the 4th grade standard, but would fit perfectly in the third grade standard 3.N.3.1. |
| 39 | The standard for this item asks students to know the term equally likely. This item uses the term likely, which is a different concept. The item should be rewritten to assess the concept of equally likely can be measured in better alignment with the standard. |
| 39 | This problem does not relate to the standard which specifies equally likely or not equally likely outcomes. The problem has a correct response of likely. |
| 39 | The wording on this item should be clarified to match the standard using the terms "equally likely" and "not equally likely". |
| 39 | This question doesn't apply because the standard (4.S.2.1) states that students find the probability of simple events limited to equally likely and not equally likely outcomes. This question is asking them to figure probability with "likely" or "unlikely" outcomes. |
| 39 | Item 39 is possibly unfair as it is using terminology "likely" and "unlikely" which is not included/expected in the standard "equally likely" and "equally unlikely." The terminology is not in the 3rd grade standards either. |
| 39 | Likely and unlikely are not included in the objective (only equally likely), but common sense may allow for this--too much emphasis on this objective in the assessment. |
| 39 | The standard codes to equally likely and not equally likely. The choices that are given do not match because the students are given likely and unlikely. |
| 43 | The distractors A-Triangular and B-Square are so obviously wrong they should be changed to distractors that have at least some connection to the content of the problem. |
| 43 | This problem is about similar triangles. The distractors A and B (triangular and square) do not work for the problem. |

Table 4.7

Notes by Reviewer

South Dakota Mathematics 2008 Grade 4

| Item Number | Comments by Reviewer |
|-------------|---|
| 43 | Answer choice A is a bad distractor (obvious wrong answer). It is obvious that the figures are not triangular. |
| 43 | Not good distractors for this item--a funny mixture using shape names and shape relations. |
| 43 | Just have a picture alone in the problem. I believe the students will get confused when you say "each side of the second figure is exactly $\frac{2}{3}$ the length of the matching side of the first figure." Otherwise use $\frac{1}{2}$ instead of $\frac{2}{3}$. |
| 44 | Distractors B and D in this problem are so obviously wrong they should be changed to distractors that have the numbers 4 and 7 in them, the numbers used in the problem. |
| 44 | This problem shows two 4×7 arrays to illustrate the commutative property. The distractors using numbers like 8×5 and 3×6 don't seem to fit. |
| 44 | Need to change some of the distractors to make it more difficult. |
| 45 | This item is a very weak measure of students' understanding of the less than relationship. |
| 45 | This problem using inequality doesn't fit the standard which asks students to select the appropriate relational symbol. It is more about evaluating expressions. |
| 45 | This doesn't really fit the standard because the less than sign is already in the problem and the student doesn't have to place it. |
| 45 | The standard 4.A.2.1 states that students should "select an appropriate relational symbol," however the question has them substitute numbers in order to make the number sentence true. The symbol has already been selected for them. |
| 45 | Standard 4.A.2.1. is not a good match for this problem as students are not expected to select the correct relational symbol, but it is the best of the options in the standards. |
| 45 | I could not find a standard that this problem fits well in, but this was the best place. I could not find a standard that addressed substitution. |
| 50 | This item assesses whether students can make the correct decision about how to handle a remainder in a division problem with a real world context, a skill not addressed in the standards at this grade level. |
| 50 | There is no objective that fits solving a word problem involving division and remainders. |
| 53 | The problem asks students to identify a prism. The standard states "rectangular prism". |
| 53 | One of the options, and the answer for this problem, is 'prism.' However the standards include rectangular prism as the definition. |
| 53 | This item uses prism, the objective only includes rectangular prism. Have students had the opportunity to learn that a cube is a prism? |
| 53 | One of the choices for an answer is the prism and should be stated as a rectangular prism. |

Table 4.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 4

| Item Number | Comments by Reviewer |
|-------------|---|
| 54 | This item uses the term likely which is not in the standards at this grade level. The standards address the concept of equally likely which is not the same as likely. |
| 54 | This probability problem is asking for an answer of likely or unlikely. The standard states equally likely and not equally likely outcomes. |
| 54 | The standard refers to "equally likely" and "not equally likely" whereas the item uses "likely" and "unlikely". |
| 54 | This question doesn't apply because the standard (4.S.2.1) states that students find the probability of simple events limited to equally likely and not equally likely outcomes. This question is asking them to figure probability with "likely" or "unlikely" outcomes. |
| 54 | This is similar to item 39 where the terms in the problem/answers (likely and unlikely) do not match the expectations of the standard (equally likely and equally unlikely.) |
| 54 | Another item that uses likely and unlikely which are not specifically in the standard. |
| 54 | The standard says that you need "equally likely" and "not equally likely." The answer choices for the problem are "likely" and "unlikely." |
| 57 | The dimensions on the distractors in this item are too close to being the same. I would have missed this problem. |
| 57 | This may have begun as a good idea, but the optical illusion and size of the options make the item very difficult. It is not clear what is really being tested. |
| 65 | The standard 4.A.2.2 states that students are to "simplify a two-step equation using whole numbers," however the question asks students to SOLVE the equation by using a whole number. |
| 65 | Not a good match to the objective---need a substitution objective (students can substitute a value for in unknown to determine a true sentence. |
| 67 | This question also addresses M.1.2. solving problems with money. |
| 70 | This item asks students to identify a line of symmetry, a term not addressed in the standards for this grade level. |
| 70 | This item asks students to identify a line of symmetry. There is no mention of line of symmetry in any of the objectives. |
| 70 | The item asks for a line of symmetry. There is no mention of symmetry in the standards in geometry. |
| 70 | There is no standard in 4th grade that mentions the concept of symmetry. This question asks which line segment is a line of symmetry. |
| 70 | Item 70 requires student knowledge of symmetry which is not evident in the 4th grade standards or the previous 3rd grade standards. |
| 70 | Line symmetry is not mentioned in any specific objective. |
| 70 | There is no standard in 4th grade that has the words "line of symmetry" in it. |
| 77 | Item 77 is similar to items 39 and 54, using the terminology of 'likely' and 'unlikely' which is not included in the standard. |

Table 4.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 4

| Item Number | Comments by Reviewer |
|-------------|---|
| 78 | The objective does not specifically relate two-dimensions to three-dimensional shapes. |
| 84 | The standard that best matches this item addresses writing 1-step equations, where this item asks students to write a 2-step equation. |
| 84 | This is a 2 step word problem while the standard only includes 1 step. |
| 84 | Standard 4.A.3.1 states that students are to write and solve number sentences that represent ONE-STEP word problems. This particular problem asks them to perform a 2-step problem. |
| 84 | Not quite a match since it has two-steps and the objective says one-step. |
| 84 | This problem is a 2-step word problem and the standard asks for one-step word problems. This was the best place for this standard, because there was no other choice. |
| 88 | Poor item---what else could you answer? It is not clear that anything but the number in the item is the number chosen. |
| 89 | This item asks students to determine the mean in a set of data. Mean is not among the measures addressed in the standards at this grade level. |
| 89 | The standards indicate students should be able to identify the median, mode, and range. The problem asks students to identify the mean. |
| 89 | This item asks for a mean which is not mentioned in the standards for 4th grade. |
| 89 | The standard 4.S.1.2 doesn't fit with this item because it states that students are able to identify the median, mode, and range, however this question asks students to find the mean (average) of the data set. |
| 89 | Item 89 requires students to determine the mean of scores provided. Mean has not been introduced in the 4th grade standards. |
| 89 | Mean is not part of the objective at this level. An unfair question. |
| 89 | This problem does not match the standard because it deals with mean. The standard only deals with median, mode and range. |
| 91 | Ite 91 refers to a "one-step" translation (slide) in the problem. There is no indication from the 4th grade standards that they would be expected to know a "one-step" slide. |
| 91 | Has a one-step slide been defined? Not clear why this description was used. |

Table 5.5
Source-of-Challenge Issues by Reviewer
South Dakota Mathematics 2008 Grade 5

| Item Number | Comments by Reviewer |
|-------------|--|
| 1 | Item 1 requires students to subtract 14-7. The answers provided are 98, 21, 7, and 2. In this case the answer is 7. How do you know the student actually did the subtraction or just picked a number that was in the problem? |
| 1 | Item's answer is one of the numbers in the problem---does not need to be. Students resort to this strategie, so you do not know why the answer was selected. |
| 19 | Some students who have traveled in an airplane a lot may think that you must check in an hour before take-off. This item states in the first sentence, "Mr. Adams has 1 3/4 hours before his next flight." The sentence may need to state, "Mr. Adams has 1 3/4 hours before he must check in for his next flight." |
| 19 | Item 19 would be confusing to students. It asks students how much time the person can spend shopping before his next flight leaves. If this is real-life application, then one would also take into account how soon before the flight leaves the person has to be at the gate - not just when the flight leaves. Perhaps the beginning could be reworded to say, "Mr. Adams has 1-3/4 hours before he needs to be at the gate for his next flight..." |
| 19 | Change the mixed number in the first sentence from 1 3/4 to a larger mixed number to make the context of the problem realistic otherwise it may confuse students. |
| 22 | There is no correct answer for this item. It assumes that you cannot make a decision about mode if a data set has no mode, whereas saying that data has no mode is a decision that can be made relative to modes of such sets. |
| 22 | There is no correct answer given here. Mean ,median. mode, and range can be calculated from any set of data...even if the the mode is "no mode". |
| 22 | This item is a mathematically incorrect item. There is no "correct" answer. It asks which measure can NOT be calculated (the answer is "mode"), however, mode can be calculated as "no mode." |
| 22 | Item 22 asks students which measure the person would not calculate based on data she collected. The options are mean, median, mode, range. Although there is no mode in the data, the student has to determine this and the answer for the calculation would be "no mode," - not that mode would not be included. So there is no correct answer in this item. |
| 22 | There is no correct answer. There is no mode---but that you can say (Is that calculating)---so she should report that there is no mode (not that she can't calculate it). |
| 22 | There is no correct answer for this problem. The question asks students "Which measure will Chantal not be able to calculate" and gives the choices of mean, median, mode and range. All of these you can calculate. |

Table 5.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 5

| Item Number | Comments by Reviewer |
|-------------|---|
| 1 | This item asks students to subtract 7 from 14, a skill not addressed in the standards for this grade level, and too low for expectations for students at this grade level. |
| 1 | The item asks students to subtract 7 from 21. That is too easy for a fifth grade test item. It doesn't fit with any of the standards. |
| 1 | The item asks for how many comic books one child has if he has 7 fewer than his friend who has 14. This item is too low level for a 5th grade student. |
| 1 | This item asks students to subtract 7 from 14, which is a skill below the expectations presented in this standard for the grade level. |
| 1 | Item 1 is a simple subtraction problem (14-7). This concept is extremely low for a 5th grade problem. |
| 1 | This is an item that is below grade level. |
| 1 | This question is too low for this grade level. The question says "Robby has 14 comic books. Fernando has 7 comic books less than Robby. How many comic books does Fernando have?" All this question wants is to subtract 7 from 14. |
| 4 | Item 4 requires students to move up and down a number line based on instructions of the problem. The answers are given with arrows pointing to the left and right and then a number. There does not seem to be any standard that specifically addresses this concept/skill. |
| 9 | Standard specifies finding the line of symmetry for rectangles, squares and triangles. This problem requires students to find the line of symmetry for letters. |
| 9 | The standard limits symmetry to geometric figures, not letters or other shapes that are given in the test item. |
| 9 | The standard 5.G.2.1 states that students are to determine lines of symmetry in "rectangles, squares and triangles," whereas this item asks them to find lines of symmetry in letters of the alphabet. |
| 9 | Item 9 requires students to determine lines of symmetry in block lettering. The standard only addresses symmetry in rectangles, squares and triangles. |
| 9 | Objective says that students will identify lines of symmetry in certain geometric figures---these are not geometric figures. |
| 9 | The standard says to find symmetry in rectangles, squares and triangles. This problem asks how many of the letters in the word below appear to have at least 1 line of symmetry. |
| 17 | The standard for this grade says the students need to estimate length and weight and this problem has you estimate area. This is the only place this problem would fit. |
| 18 | Item 18 appears to be about "certainty" but is more involved than the standard 5.S.2.1. which simply asks students to classify a simple event. Therefore, I put it under 5.N.3.1. based on non-routine strategies to solve. |

Table 5.7

Notes by Reviewer

South Dakota Mathematics 2008 Grade 5

| Item Number | Comments by Reviewer |
|-------------|---|
| 18 | No specific objective in statistics for this--so more of a general problem solving. |
| 19 | Item is poorly worded--better to state that Mr. had 1 3/4 hours before having to be at the gate (rather than before the next flight). |
| 28 | This item includes a circle graph, a topic not addressed at this grade level, and addition of per cents, another topic not yet introduced at this grade level. Neither topic is included in the standards. In addition, it asks students to know the mathematical meaning of the word "or" in the question "...what is the percent of students who prefer math or science?" |
| 28 | The problem uses a circle graph, percents and a "or" question "what is the percent of students who prefer math or science." These concepts were not included in the standard 5.S.1.1 |
| 28 | This item uses a circle graph and % in the graph. Have % or circle graphs been introduced anywhere in the standards? |
| 28 | This question uses a circle graph, which students have not seen yet in 5th grade. The standard 5.S.1.1 states that they should be using only simple bar graphs, line plots, pictographs, and line graphs. Also, the circle graph used percents, which have not been introduced in the standards yet either. It also might have been helpful to list 31% (math) and 34% (science) as distractors in the answer options, considering the question asked what percent of students preferred math OR science (65%). |
| 28 | Item 28 requires students to compare percents. Percents have not been included in the 5th grade or previous standards. |
| 28 | Neither circle graph or percent is mentioned in Grade 5 objective. |
| 28 | The circle graph is not in the standard 5.S.1.1., but this is the only standard it seemed to fit under. Percents are also not emphasized in any of the standards. I am wondering if it has been introduced yet? We are testing over things not covered. |
| 30 | This item asks students to round five-digit numbers which is not in the standards at this grade level. |
| 30 | The problem requires rounding 47,864 to the nearest hundred. There is no mention of rounding in the standard. |
| 30 | This item asks for a rounding to the nearest 100. There is nothing in the standards about rounding. This was a 3rd grade standard. |
| 30 | The standards in 5th grade don't involve rounding whole numbers to the nearest hundred (the problem wanted students to round 47,864 to the nearest hundred). Standards only mention estimation strategies to solve problems with whole numbers (5.N.3.1). |
| 30 | Item 30 requires students to round to the nearest hundred. There is no 5th grade standard that covers this. |
| 30 | There is no mention of rounding larger numbers in any specific objective |
| 30 | There is no standard at this grade level that specifically deals with rounding for this grade. |

Table 5.7

Notes by Reviewer

South Dakota Mathematics 2008 Grade 5

| Item Number | Comments by Reviewer |
|-------------|---|
| 34 | The item is a number line with a point on -2. The question asks which point is closest to -2. Why not just ask which point is on -2? |
| 34 | The wording "which point is closest to -2 on the number line?" is not correct. Since there is a point plotted ON -2, the wording should say, "which point represents -2 on the number line?" |
| 34 | Item 34 asks the student to determine the point "closest to" -2 on the number line, when in fact one of the points given is exactly -2. This verbage would be distracting to students. |
| 34 | The question states "Which point is closest to the location of -2 on the number line?" and the question should state which point best represents instead of closest, because one of the answers is exact. |
| 37 | This item asks students to represent probability as a fraction, a topic that has not yet been taught to students, and is not included in the standards for this grade level. |
| 37 | The problem requires students to write the probability as a fraction showing favorable outcomes over total outcomes. This has not been taught to them. It isn't in any of the standards. |
| 37 | This item is a probability problem with fractional answers. The standard only refers to whether something is certain, likely, unlikely or impossible to happen. |
| 37 | The standard 5.S.2.1 only states that students only need to "classify" probability as being certain, likely, unlikely, or impossible. This item asks students to figure probability ($\frac{3}{8}$) after using a spinner. This skill has not yet been introduced in 5th grade. |
| 37 | This is not included in the objectives for this grade level. It requires knowing that a probability is a fraction. |
| 37 | We are testing students on information that they haven't had yet. Students do not know how to represent probability yet and they have to do it for this problem. |
| 47 | This is an example in which the context does not help, is probably distracting. What is a mat for a track team? |
| 48 | The drawing included with this problem has bear tracks straddling a portion of a numberline. There are six paw prints, and the problem talks about 5 strides of the bear which might confuse students. Eliminating the paw prints might make this item less confusing to students. |
| 48 | This problem uses metric measurement for the label. The standards use the U.S. Customary units. |
| 48 | Students haven't learned about centimeters yet (metric system of measurement). The item asks them to add 5 measurements together in order to find the combined length of five strides (answer: 210 cm). Even though students can solve the problem, it might be better to list the measurements in inches, since they have seen the U.S. Customary units of measure in 5th grade already. |

Table 5.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 5

| Item Number | Comments by Reviewer |
|-------------|--|
| 48 | Item 48 uses centimeters as the measurement. There are no standards in the SD standards that address metric measure. |
| 52 | This item asks students to choose the expression that is not equivalent to the one given. The word not should be capitalized and bolded for clarity for students. |
| 52 | It might be helpful to put the word "not" in bold lettering to help students see it better. |
| 65 | Item 65 asks students to look at a shape and name it. The answer is square pyramid which is not in the standards. |
| 67 | \ |
| 68 | This item asks students to subtract two two-digit numbers, a skill below the level of expectations for this grade level and not included in the standards. |
| 68 | The problem requires students to subtract 28 from 85. That does not fit with any of the standards. It also is too easy for a 5th grade test. |
| 68 | This item asks for a simple addition to find out how many more tickets one student has than another. It is way below 5th grade level. |
| 68 | This item asks students to add 85 and 28, which is a skill below the expectations presented in this standard for the grade level. |
| 68 | Item 1 is a simple subtraction problem. This concept is extremely low for a 5th grade problem. |
| 68 | Same comment as for #1. |
| 68 | This question is too easy for the fifth grade assessment. This problem is just a subtraction problem. It asks students to find out how many more tickets one person sold than another. |
| 70 | This item asks students to locate the lines of symmetry of a hexagon, a shape that is not included in the study of symmetry addressed in the standards for this grade level. |
| 70 | Students need to find the lines of symmetry for a hexagon. The standard does not mention hexagons. |
| 70 | The standard for symmetry is very specific about what shapes will be used for finding lines of symmetry. This item uses a hexagon which is not one of the items in the standard. |
| 70 | The standard 5.G.2.1 does not list that students should be finding symmetry of hexagons (as in this item). They should only be finding symmetry in rectangles, triangles, and squares. |
| 70 | Item 70 requires students to determine the number of lines of symmetry in a hexagon, although the requirements of the standard are for rectangles, squares and triangles. |
| 70 | No hexagon in list of figures for symmetry objective. |
| 70 | In this problem students have to find the lines of symmetry in the hexagon. Hexagons are not included in the standard G.2.1. The standard includes finding symmetry of rectangles, squares and triangles. This was the only logical place to put this problem. |

Table 5.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 5

| Item Number | Comments by Reviewer |
|-------------|--|
| 79 | Note: one of the distractors (60) is too close to a possible answer. Problem shows a thermometer showing 74 degrees. The temperature changed by 15 degrees. What could have been the temperature? |
| 79 | The distractor of 60 is really close---considering the approximation nature of a measure if it is just a little of 74 degrees and drops 14.5 (or 15) degrees---it is really near 60. |
| 84 | This is a single digit divisor while the standard only says double digit divisors. Why is the phrase "least number of pages" used in the item when the exact answer is one of the choices? |
| 84 | In Standard 5.N.2.1, it states that students are to find the quotient of whole numbers using two-digit divisors. In this particular item, students are asked to divide 360 by 8, which is a single-digit divisor. Also, the word "least" doesn't need to be in the problem. It asks, "what is the least number of pages Rusty will need for the album?" and the exact answer is one of the choices. |
| 84 | Item 84 is a simple division problem with a one-digit divisor and does not have a 5th grade standard that addresses this. Additionally, the question is, "What is the least number of pages" that will be needed. However, the exact number needed is listed as one of the answers. |
| 84 | This standard N.2.1 states that students are able to find the quotient of whole numbers using two-digit divisors and this problem deals with a one digit divisor. This standard is the best place for this question though. Also the question asks " What is the least number of pages Rusty will need to put all of his cards in the album?" The answer comes out exact so you could take out the word least in this problem. |
| 85 | Item 84 is a simple division problem with a one-digit divisor and does not have a 5th grade standard that addresses this. Additionally, the question is, "What is the least number of pages" that will be needed. However, the exact number needed is listed as one of the answers. |
| 89 | This item asks student to analyze a function with only one operation in the pattern. This is not a topic that is included in the standards at this grade level. |
| 89 | The problem describes a function using an input output table. It does not match the standard that states using patterns involving more than one operation. This function used 1 operation. |
| 89 | This item is a function with only 1 operation which is not a choice in the standards for this grade level. |
| 89 | This item fits into standard 5.A.4 because it deals with filling in missing values in a function table. |
| 89 | Item 89 required students to figure out a function which is not clearly covered by the standards at 5th grade. |
| 89 | This is a function==but not two operations. |

Table 5.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 5

| Item Number | Comments by Reviewer |
|-------------|---|
| 89 | Standard A.4.1 states "students are able to solve problems using patterns involving more than one operation." This problem is a function which has only one operation, but this is the best place to put this question. |
| 91 | This item asks students to label a triangle as isosceles without giving students the lengths of sides. It is not good mathematically to ask students to make assumptions about such things as the lengths of sides based on their visual estimation. The item should include the side lengths in the given triangle. |
| 91 | The problem asks students to identify an isosceles triangle. It is difficult to tell what type of triangle it is by just looking. The lengths of the sides should be labeled. |
| 91 | This item asks for the best name for a triangle but doesn't give any dimensions on the triangle. The item should have tick marks or give lengths on the triangle so students don't have to guess. |
| 91 | This item involves a picture of a triangle and asks which word best describes the triangle. The answer is "isosceles," however the sides of the triangle look EXTREMELY close in length. Students may choose the "equilateral" answer because they can't see the difference. To help with confusion, the sides can be labeled with measurement lengths, such as 5 in, 5 in, and 8 inches, so that students can choose the correct answer. |
| 91 | Item 91 requires the student to identify an isosceles triangle, however the picture is somewhat ambiguous and the side lengths should be labeled. |
| 91 | Bad mathematics not to label sides which are equal lengths. Making students make assumptions about figures that are not warranted by just looking. |
| 91 | Need to give measurements for the sides to help the students, otherwise it is too hard to tell what kind of triangle it is. |
| 92 | This meets an objective of grade 4 (equally likely), not grade 5. |

Table 6.5

Source-of-Challenge Issues by Reviewer
South Dakota Mathematics 2008 Grade 6

| Item Number | Comments by Reviewer |
|-------------|---|
| 92 | This item has 12 shapes in a bag. 4 of the shapes are different. The question asks how many different outcomes are possible on the first try. There are 12 different outcomes that are possible. I believe the question should ask "How many different shapes are possible on the first try". |
| 92 | The outcome is not clearly specified in this item. Thus, there are two answers--12 (the number of shapes) and 3 (the number of different shapes). |

Table 6.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 6

| Item Number | Comments by Reviewer |
|-------------|---|
| 1 | This item asks students to identify a slide which is not included in the standards at this grade level. |
| 1 | This problem is a slide but the standard states reflection. |
| 1 | This item refers to a slide transformation and there is no mention of a slide in the standard. |
| 1 | The standard 6.G.2.1 needs to include translations in the description. This question asks students to identify a figure that has been translated across a line and the standard only mentions reflections. |
| 1 | Item 1 requires student to identify a slide which is not under the 6th grade standards but was covered in the 5th grade standards. |
| 1 | This item is about slides, objective is about reflections. |
| 1 | The standard G.2.1 states that students need to identify reflections. The question on the test asks about a translation and it is not in the standard. |
| 7 | This item asks students to pick out the exception from among the choices of figures described. The word except should be in bold print so it is more obvious to students. |
| 11 | Capacity not mentioned in the objective. |
| 12 | Item 12 requires students to identify $2\frac{2}{3}$ on a number line using unmarked points between 2 and 3 which is not covered in the standard. |
| 12 | This is a stretch, no number line is mentioned--and this equivalence is between a fraction and a point on a number line. |
| 16 | Problem is more algebraic, but since it has decimals the only fit was in number. |
| 24 | Item 24 refers to intervals on a bar graph. Where does this appear in the standards? |
| 30 | This item asks students to subtract three digit whole numbers, a skill that is not included in the standards at this grade level. This item is below expectations for this grade level. |
| 30 | There is not a standard that matches this problem. Probably because it is way below grade level. It ask students to add two 3 digit whole numbers. |
| 30 | This item asks the students to subtract 261 from 343. This is much to easy a task for this grade level. |
| 30 | This item asks students to subtract 261 from 343 in order to solve. This task is not included in a standard for 5th grade and is far below grade level. |
| 30 | Item 30 is a simple 3-digit subtraction problem and way too low for 6th grade, nor is this skill covered by the 6th grade standards. |
| 30 | Way below this grade level. |
| 30 | This problem is below grade level. It is a simple subtraction problem with three digit numbers that asks how many more metric tons of gold did one country produce than another. There is no standard to match this to. |
| 31 | This item asks students to pick out the exception among the choices of expressions. The word except should be bold to stand out for students, making the task more clear to them. |

Table 6.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 6

| Item Number | Comments by Reviewer |
|-------------|--|
| 46 | This item asks students to select the figures that are not congruent. The word not should be bold to help students understand the task. |
| 49 | This item asks student to calculate the measure of the third angle of a triangle, given the other two and that the sum is 180 degrees. Standards at this grade do not address the degree measure of angles, only addressing the size of angles by the terms acute, obtuse, and right. |
| 49 | This problem gives students 2 angles of a triangle and asks them to find the degrees in the 3rd angle given that there are 180 degrees in a triangle. This is not specifically stated in the standard. No place does it talk about degrees. |
| 49 | The item gives 2 angles of a triangle and asks the student to find the 3rd angle. This item really doesn't fit this standard very well. I'm not sure if the item is about problem solving or finding the sum of the angles of a triangle. |
| 49 | This item fits into standard 6.G.1.2 because it is asking students to describe angles by figuring out the third angle measure, given 2 angle measures in the triangle. However, students have not been exposed to degrees or measuring angles in the past. This problem also involves adding whole numbers, then subtracting from 180 in order to solve. |
| 49 | Item 49 uses the number of degrees in a triangle to determine the answer. While the rule is given that the sum of the 3 angles in any triangle is 180 degrees, this problem is really an addition and subtraction problem. Additionally, no where in the standards so far have degrees of angles been mentioned. |
| 49 | This question does not fit very well in the standard G.1.2 The question tells the students there are 180 degrees in a triangle and that all three angles must add up to 180 degrees. Students must then give the missing angle. The standard does not talk about degrees, but we assume that the students have studied degrees. I also understand that this question may fit under this standard because it is a way to describe triangles. |
| 58 | This item asks students to add three 3-digit numbers which is not addressed in the standards at this grade level, and is below the level of expectations for this grade. |
| 58 | This problem does not fit a standard. It requires adding three 3 digit whole numbers. That is too easy for 6th graders. |
| 58 | The item asks for the student to add three 3 digit whole numbers. This item is too low for this grade level. |
| 58 | The item asks students to add three 3-digit numbers together in order to solve. This skill is not found in the standards for 5th grade and is too low for this grade level. |
| 58 | Item 58 requires the student to add 3 three-digit numbers from a table. This is a very low problem for 6th grade students. |
| 58 | Below this grade level. |

Table 6.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 6

| Item Number | Comments by Reviewer |
|-------------|--|
| 58 | This question is too low for this grade level. This question is just an adding problem. It just asks for the total amount of kilowatt-hours produced by three countries. |
| 65 | This item asks students to select the probability that she will not draw the letter B from among a set of wooden tiles. The word not should be bold so it stands out and makes it clear to students what their task is. |
| 70 | This item asks students to determine how many different outcomes are possible for one spin on a given spinner. Determining the number of different outcomes is not in the standards at this grade level. |
| 70 | The standard does not address outcomes. This problem has a spinner with several 2's and two 3's and one 1. The students could find two correct answers for the problem because outcome is not defined. They could count each number and get 6 outcomes or they could say there are 3 outcomes 1,2,or 3. |
| 70 | This item asks the student for the number of outcomes on a spinner. The standard doesn't include finding the number of outcomes. |
| 70 | The standard 6.S.2.1 asks students to find the probability of a simple event and to express that as a fraction. In this test item, it asks students to find out how many different outcomes are possible, which is not included in the standard. |
| 70 | Item 70 requires students to determine how many different outcomes would occur from spinning a spinner that is divided into 6 equal parts and with one part labeled '1', three parts labeled '2', and two parts labeled '3' in random order around the spinner. The question would be confusing to students as they may answer 6 different outcomes - instead of 3 - depending on where on the circle (which '2' or which '3') the spinner landed. |
| 70 | The outcome definition must be implied from the game context---this is ok but rather vague and students could think that outcome was the number of spaces on the spinner (6 places to land). The item does not match any objective. |
| 70 | The standard S.2.1 does not address outcomes and this question asks the students for outcomes. The question asks "How many different outcomes are possible for a spin...?" Students have not been taught outcomes. |
| 88 | The wording in this item "she plans to play a CD with 16 songs including her 2 favorite songs" is confusing. The item asks to find the probability that she will hear her favorite song first (1/16), however, the wording could have been construed as the CD having 18 songs ("including her 2 favorite songs"). The item might have been less confusing if it read "the CD with 16 songs, 2 of which are her favorite." |
| 91 | This problem involving a balance scale and n+6 balances 30 is too easy for 6th grade. |

Table 6.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 6

| Item Number | Comments by Reviewer |
|-------------|---|
| 92 | This item asks students to determine how many different outcomes are possible when drawing shapes from a bag. The concept of different outcomes is not addressed in the standards for this grade level. |
| 92 | The bag contains 4 cubes, 3 spheres, 3 pyramids and 1 cyclinder. Each one of the individual objects could be an outcome because the outcome is not clearly defined. This results in two answers 12 and 4. |
| 92 | Finding the number of outcomes are not mentioned in the standard. |
| 92 | The standard 6.S.2.1 asks students to find the probability of a simple event and to express that as a fraction. In this test item, it asks students to find out how many different outcomes are possible, which is not included in the standard. |
| 92 | Item 92 requires student to determine how many possible outcomes could occur by pulling one shape out of a bag. There are 4 cubes, 3 pyramids, 3 spheres and 1 cylinder in the bag. Conceivably a student would indicate that there were 10 possible outcomes because pulling one cube would be different than pulling out either of the other cubes. The outcome is not clearly defined in this problem. |
| 92 | The item does not match any specific objectives at this grade level. |
| 92 | The standard S.2.1 says that students are to find probability of a simple event and this question asks for outcomes. The question needs to specifically state what they are looking for in the outcomes. |

Table 7.5
Source-of-Challenge Issues by Reviewer
South Dakota Mathematics 2008 Grade 7

| Item Number | Comments by Reviewer |
|-------------|----------------------|
|-------------|----------------------|

Table 7.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 7

| Item Number | Comments by Reviewer |
|-------------|---|
| 2 | The problem asks for theoretical probability which is not mentioned in the standard. |
| 2 | The standard 7.S.2.1 states that students should be able to find the probability of an outcome. This item asks students to find out how many times a person should expect to land on a section of a spinner. This truly isn't "finding probability," but finding expected outcomes, which is not found in a standard. |
| 2 | These are really expected value problems, needs to be noted in this objective |
| 8 | The problem uses exponents and exponents are not mentioned in the standard. |
| 8 | The standard 7.N.1.1 states that students should be able to compare integers, decimals, percents, and fractions, however this item asks students to compare exponents. Since the standard doesn't include this in the description, it should not be tested. |
| 8 | Item 8 requires students to have knowledge of exponents which are not in the 7th grade standards. |
| 8 | Exponents are involved, should be mentioned in the objective so it is clear that they are to be taught. |
| 8 | Standard N.1.1 states nothing about exponents and this problem had the students choose which expression had the greatest value. All the choices had exponents. |
| 10 | This item uses a numeric expression rather than an algebraic expression as stated in the standard. |
| 10 | The standard indicates using an algebraic expression while the problem uses a numeric expression. |
| 10 | The answers are not in algebraic form which may or may not match this standard. |
| 10 | The standard 7.A.4.1 states that students are to create "one-step algebraic expressions representing a pattern." This item asks students to create a "2-step numeric expression," therefore it doesn't follow the exact description of the standard. |
| 10 | Item 10 shows numeric expressions in the solutions. However, only algebraic expressions are in the standards. |
| 10 | This is not an algebraic expression, but a numerical one---on way to writing algebraic expression--so it fits best with this objective |
| 10 | I choose A.4.1 as the standard for this question, but this standard dealt with creating one-step algebraic expressions representing the pattern. The problem given contained a numeric expression representing the pattern. |
| 12 | This problem uses a numeric expression rather than an algebraic expression as stated in the standard. |
| 12 | The problem is a numeric experssion and the standard specifies an algebraic expression. |

Table 7.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 7

| Item Number | Comments by Reviewer |
|-------------|---|
| 12 | This is a numeric expression, not algebraic, but I believe it requires algebraic reasoning. |
| 12 | The standard 7.A.1.1 states that students are to write "algebraic expressions." This item asks students to write a "numeric expression," therefore it doesn't follow the exact description of the standard. |
| 12 | Another instance in which the expression is numerical, not algebraic--- |
| 12 | I choose A.4.1 as the standard for this question, but this standard dealt with creating one-step algebraic expressions representing the pattern. The problem given contained a numeric expression representing the pattern. Need some clarity on what you expect. |
| 16 | The students are asked to select the best description of the data given, whereas in the standard they are asked to make a prediction based on the data. |
| 16 | The standard S.1.2 says to make predictions from data displayed in a graph and this problem had students analyzing a graph. Need to add that in the standard. |
| 26 | This item uses decimals in a problem solving context. The standard limits the number to integers or fractions. |
| 26 | This problem uses decimals. The standard specifies fractions. |
| 26 | This standard does not include decimal numbers, but I believe the item belongs under this standard. |
| 26 | Standard 7.N.2.1 states that students are able to work with integers and positive fractions, however this question is dealing with decimals, which is not mentioned in the standards for 7th grade. |
| 26 | Item 26 requires addition of decimals however the 7th grade standards only focus on fractions and integers. |
| 26 | This is about decimals, but objective specifies fractions |
| 26 | Standard N.2.1 states that students can do all four operations with integers and fractions and this problem deals with decimals. It fits in this standard but should add decimals to the standard for this problem to fit. |
| 30 | This item asks students to recognize the net (paper pattern) of a cone. Nets or 2-D representations of 3-D objects are not addressed in the standards for this grade level. |
| 30 | This problem requires recognizing nets of three dimensional solids. Nets are not mentioned in the standards. |
| 30 | This item asks for a net of a cone. 2 dimensional nets of 3 dimensional figures are not in this standard. (But maybe should be) |
| 30 | This item asks students to identify a 2-dimensional net from a 3-dimensional figure. This skill is not included in the standards for 7th grade. |
| 30 | Item 30 displays nets of shapes for a student to choose, however nets have not been introduced in the standards. |
| 30 | No objective on relating three-dimensional objects to a two-d net. |

Table 7.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 7

| Item Number | Comments by Reviewer |
|-------------|---|
| 30 | Standard G.1.1 only talks about two-dimensional figures and this problem deals with a net of 3-dimensional figures. This problem would fit well in 8th grade. |
| 38 | This is only a one-step---objective calls for more than one-step. |
| 45 | This item uses an equation rather than an expression as stated in the standard addressing evaluating for given values of variables. |
| 45 | The problem uses replacement values for variable in an equation. The standard indicates that replacement should be done with an expression. |
| 45 | This is an equation, not an expression, but the task is to just plug in numbers and see which values make the equation true, so I believe it falls under this standard. |
| 45 | The standard 7.A.1.1 states that students are to be able to write and evaluate algebraic expressions, whereas this item asks students to evaluate an algebraic equation. |
| 45 | Emphasis is evaluating (but it is an equation rather than an expression as stated in the objective). |
| 45 | The standard A.1.1 states that students are able to write and evaluate algebraic expressions and this problem has an equation and not an expression. |
| 54 | Item 54 requires the student to find the perimeter of a simple rectangle with the dimensions of two sides given. This is a very low DOK problem for a 7th grade student. |
| 56 | This item uses decimals in a problem solving context, where the standard is limited to fractions and integers. |
| 56 | This standard only refers to integers. There are decimal values in this item (money), but I believe the item should be with this standard. |
| 56 | Standard 7.N.2.1 states that students are able to work with integers and positive fractions, however this question is dealing with decimals, which is not mentioned in the standards for 7th grade. |
| 56 | Item 56 requires the student to multiply and subtract decimals. Standard 7.N.3.1 only relates to fractions and integers. |
| 56 | The standard N.3.1 only deals with fractions and integers and this is a decimal problem. The problem fits here if the standard would include decimals. |
| 57 | This question is writtten poorly for kids---should say after the figures after a translation and then a rotation of 45 degrees. |
| 61 | This problem uses decimals in a problem solving context, whereas the standard is limited to fractions and integers. |
| 61 | The item requires students to multiply and divide decimals. The standard specifies fractions. |
| 61 | This item uses decimal fractions. The standard only refers to fractions and integers. I believe the item falls under this standard with that in mind. |

Table 7.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 7

| Item Number | Comments by Reviewer |
|-------------|---|
| 61 | Standard 7.N.2.1 states that students are able to work with integers and positive fractions, however this question is dealing with decimals, which is not mentioned in the standards for 7th grade. |
| 61 | Item 61 also requires the student to multiply and add decimals however standard 7.N.2.1 only refers to fractions and integers. |
| 65 | The question should repeat the 90 degrees clockwise rotation. |
| 77 | The item uses a scatterplot which is not mentioned in the standards. |
| 77 | The item asks which scatter plot best represents the data. The standard doesn't ask the learner to make a scatter plot, just to interpret the graph. |
| 77 | The standard 7.S.1.2 states that students are to make predictions from data displayed in a graph, however this item asks students to choose which scatter plot best represents data in a table. It isn't truly asking them to make predictions, which is what the standard describes. |
| 77 | Standard S.1.2 states students need to make predictions from a graph and this problem they have to chose which is made correctly. |
| 87 | This item asks students to evaluate equations for a given value of x , whereas the standard asks students to do this in expressions only. |
| 87 | Item uses an equation while the standard specifies an expression. |
| 87 | This item is an equation, not an expression, but you just have to plug in a given value for " x " to see which equation is true so I think it fits under this standard. |
| 87 | The standard 7.A.1.1 states that students are to be able to write and evaluate algebraic expressions, whereas this item asks students to evaluate an algebraic equation. |
| 87 | Item 87 is plugging a number in for a variable in an equation. Standard 7.A.1.1 refers only to expressions. |
| 87 | Another example of evaluating an equation, not an expression---but the intent is more evaluating than solving so fits this objective better. |
| 87 | In this problem you are using replacement values for variables, but the standard talks about expressions and not equations and this is an equation problem. |
| 89 | The item asks for expected outcome while the standard states specific outcome. |
| 89 | Another expected value problem, not clearly specified in objectives. |
| 90 | Too low for this grade level. |
| 91 | Another item that asks for expected outcome while the standard states specific outcome. |
| 92 | Great item! |

Table 8.5
Source-of-Challenge Issues by Reviewer
South Dakota Mathematics 2008 Grade 8

| Item Number | Comments by Reviewer |
|-------------|----------------------|
|-------------|----------------------|

Table 8.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 8

| Item Number | Comments by Reviewer |
|-------------|--|
| 7 | No mention of combinations in the objectives. |
| 16 | No combinations in objectives, so this becomes a problem solving. |
| 21 | If you are asking for an estimate, the answers should not be to the nearest penny. You are really asking to find the answer to the nearest cent, you should ask such. |
| 24 | The problem should be rewritten to read: Which equation represents the sentence [not expression] below? and the sentence should be punctuated as a sentence: "Seven more than three times a number is eight." changing the lower case s to a capital S and putting a period at the end. It is important to help students learn that mathematical expressions equate to phrases and that equations equate to sentences. |
| 24 | The problem should read Which equation represents the sentence below not expression. The sentence should be cleaned up to read "Seven more than...is eight." It needs a capital letter and period. |
| 37 | This item asks for the number of different ways a school package could be put together from a list. This is really using the fundamental counting principle, but it is not in the standard. |
| 37 | Combinations are not mentioned in the probability section, so it appears this is just a number problem. |
| 37 | The standard 8.S.2.1 should say use the fundamental counting principle. |
| 43 | This item has a drawing of 4 rectangles. The way the rectangles are arranged makes it very confusing to understand what the item wants. |
| 43 | The intersecting bricks on this drawing are confusing to the reader. Instead of using 4 bricks, they could have used only 2 to get the same point across in the problem. |
| 43 | The drawing in this problem is very confusing. I think it would throw students off. |
| 48 | This item asks to graph an inequality. The standard doesn't address graphing inequalities. |
| 48 | In standard 8.A.2.1, it states that students will write and solve one-step inequalities, however, this problem asks students to actually GRAPH the inequality. This is not mentioned in the description for the standard. |
| 48 | The standard A.2.1 does not state anything about putting an inequality on a number line. The standard states that students are to write and solve one-step inequalities along with two- step 1st degree equations. |
| 49 | The word not in the problem should be bold print to help students understand the problem. |
| 52 | This item asks to write the equation from the line on a graph. The standard doesn't have this task in it. |
| 52 | Standard 8.A.3.1 states that students are to determine slope or x and y intercepts from a graph. This item asks that students form an equation from a graph, which is not mentioned in the description in this standard. |

Table 8.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 8

| Item Number | Comments by Reviewer |
|-------------|---|
| 52 | This standard doesn't exactly ask for an equation but for the answer you have to choose an equation as an answer. The standard states that students will determine slope from a line or ordered pairs and identify x and y intercepts fro a graph. You need to do all of this to write your equation but they don't state you have to write an equation. |
| 53 | Standard 8.M.1.2 states that students should be able to find surface area of rectangular prisms and cylinders, however this item asks students to find the surface area of a rectangular pyramid. |
| 62 | This is the only item that I found that has two simultaneous events which is specified in this objective. |
| 64 | The word not should be bolded. |
| 70 | The problem should tell what shape the flag is and not expect students to assume that information. |
| 71 | This item asks to find the mean from a data set. The standard does not include finding the mean from just a data set. It should. |
| 71 | Standard 8.S.1.1 is too specific to include this item. The standard states that students are to find mean, median, mode and range from a stem-and-leaf plot and a line plot. This question asks students to find the mean from a data set. |
| 71 | Item 71 requires the student to determine the mean from a data set. The corresponding standard states "Students are able to find the mean, median, mode, and range of a data set from a stem-and-leaf plot and a line plot." Perhaps this could be modified to read, "...and range from a data set, stem-and-leaf plot, and a line plot." |
| 71 | The standard S.1.1 states that students are able to find the mean, median, mode, and range of a data set from a stem and leaf plot and a line plot. This limits the questions you can have. This problem did not deal with steam and lear or a line plot, but this is where the problem needed to be placed. I believe the standard should state that students are able to find the mean, median, mode and range from a data set or a stem and leaf plot and line plot. |
| 84 | This is a 2 step inequality while the standard specifically states 1 step inequalities. |
| 84 | Standard 8.A.2.1 states that students are to write and solve one-step inequalities. This question asks students to write a two-step inequality, which is not included in this standard. |
| 84 | Item 84 requires the student to determine the answer based on a two-step inequality. The closest standard (8.A.2.1) specifies 'one-step' inequalities. |
| 84 | The standard A.2.1 says it should be a 1 step problem and this is a 2 step problem. |
| 86 | This is a very simple problem for 8th grade. It is a simple problem of rounding numbers to the nearest hundred thousand. |

Table 11.5
Source-of-Challenge by Reviewer
South Dakota Mathematics 2008 Grade 11

| Item Number | Comments by Reviewer |
|-------------|----------------------|
|-------------|----------------------|

Table 11.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 11

| Item Number | Comments by Reviewer |
|-------------|---|
| 4 | This item asks students to simplify and inequality and represent the answer as another inequality. The standard asks students to represent answers to inequalities on number lines. |
| 4 | The item solves and inequality but does not represent solutions on a number line as stated in the standard. |
| 4 | d. |
| 6 | Item is not a multi-step equation, which the standard describes. It is a one-step equation. |
| 6 | Although Item 6 is not a multi-step equation, this was the closest standard to the problem. |
| 6 | Objective does not specify solving, but there is nowhere else it fits. It is an appropriate skill for this grade |
| 6 | The standard for A 2.1 states you need to transform multi-step problems and this is just a 1 step problem. |
| 7 | There is no standard that has students write algebraic equations from a problem situation. |
| 7 | This problem is asking students to write equations, but the standard asks students to transform them. |
| 7 | Item 7 uses two variables to represent the problem. |
| 7 | There is no standard that has students write algebraic equations. |
| 20 | The standard says to compare data sets and this item just wand the mode from 1 data set. |
| 20 | This item is not comparing data sets (as the standard implies), but only asking students to find the mode of one data set. |
| 20 | The standard S.1.2 states that students will compare 2 data sets and this question the students are given one data set to find the mode. |
| 21 | Item asks the sum of the interior angles of a triangle. This is below grade level expectations. |
| 22 | Exponents are not integral, but $1/2$ seems ok for this grade |
| 23 | There is not an objective focusing on growth or on percents. If this is to be at all practical for Grade 11, percents should be mentioned as well as true applications. |
| 30 | In Item 30, the wording of the question in this problem is very awkward. Perhaps they could ask, 'Which is the closest ratio of the mean to the range?' |
| 30 | This question needs to be cleaned up. The question is very hard to read, it needs to be written in a different way. |
| 31 | The item does require choosing a suitable unit; however it does not ask for rate of change. |
| 33 | Standard states expression and this item uses an equation. |
| 35 | The item involves calculating slope but does not require interpretation of the slope. |
| 37 | Requires solving and inequality but not showing solutions on a number line. |

Table 11.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 11

| Item Number | Comments by Reviewer |
|-------------|---|
| 46 | This would be a more reasonable problem if the price was \$4.19 (and clearly roundable to \$4)---but because it is price, and you want to know if you have enough money, then one would be safer to use \$5 (or a 5 rather than a 4 in the expression)---MATH SHOULD MAKE CENTS (SENSE). |
| 47 | Only need to check the first pair of coordinates in each table to eliminate the first three tables---poor distractors. |
| 49 | THIS item just asks for the mean of 1 data set. The standard says to compare measures of central tendency of data sets. |
| 49 | Item is not asking students to compare data sets, as the standard implies. It is asking them to find the mean of one data set. |
| 49 | Standard S.1.2 states that students are able to compare multiple 1 variable data sets. In this problem you are just finding the mean of three numbers. |
| 51 | This item is a compound probability item---not mentioned in the objectives. |
| 53 | The translation is too easy for 11th grade. |
| 56 | Expected value is not mentioned in the objectives which is the essence of this item. |
| 57 | No clear objective for evaluating expressions at this grade level. |
| 59 | This item is about proportions---since it is a percent it is a proportion. However, I feel strongly that there should be a home for this type of item that specifies percent. |
| 61 | Graphs could be a little clearer to see the difference between A and C. If anyone eyesight is a little bit bad, it is a strain! |
| 64 | This item asks students to determine how many times two travelers meet along trips that are each represented as a set of non-linear connected points. Students are interpreting a math model as stated in the standard, but the model is not linear. Also, it might be helpful to students to bold the phrase "after they began" so they are clear that they are not to count the starting point. |
| 64 | Item involves two sets of nonlinear connected points and asks students to identify the number of intersections requiring them to interpret the graph. Interpretation is not included in the standards. The words "after the begin" should be boldfaced or underlined. |
| 64 | Item 64 shows a double line graph which is not specified in the standards, so 9-12.S.1.3 was chosen (scatterplot, box-and-whisker, histogram.) |
| 72 | Again, an objective about percents would be appropriate. |
| 85 | This item asks students to state the effect on the volume of a pyramid when one length is doubled. The effect on volume when a side length is changed is addressed in the standards for grade 8, but is not in these standards for grades 9-12. |
| 85 | The items requires understanding what happens to volume when an edge of a pyramid is doubled. Volume is not addressed in the standard. |
| 85 | Standards do not cover volume, so put Item 85 (volume of a pyramid) in with standard for using a formula for area. |

Table 11.7
Notes by Reviewer
South Dakota Mathematics 2008 Grade 11

| Item Number | Comments by Reviewer |
|-------------|--|
| 88 | It might clarify this item a bit for students if it were to state that the value of x in the equation is the same as that in the expression. Students should not be expected to assume that, and it is essential to being able to solve the problem. |
| 88 | The items requires students to solve an equation and then replace a variable. Please add a statement noting that the x represents the same quantity in both the equation and the expression. |
| 88 | It really involves these two objectives. It is a strong enough item to be counted twice in the analysis. |
| 91 | Students are asked to find an experimental probability which is not addressed in the standards for this grade level. |
| 91 | The items requires finding the experimental probability which is not included in the standards. |
| 92 | There is no objective that even mentions this. |

Appendix D

Debrief Summary Notes

**South Dakota
Grades 3-8 and 11
Mathematics
2008**

Table 3.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 3

A. For each standard, did the items cover the most important topics you expected by the standard? If not, what topics were not assessed that should have been?

- For the most part, the most important topics were assessed. The standard on telling time was minimally assessed, and might have received more attention. There seemed to be too much emphasis on similarity and congruence and on rounding two- and three-digit numbers.
- There were no questions identifying cubes, spheres, or cylinders. Overall I don't think the Measurement standard was assessed as well as the other content areas.
- Yes, for the most part. Perhaps there could be a few more items on the measurement standard and a less items on the number sense strand as well as standard g.2.1 (similarity and congruence).
- Standard 3.M.1.3 (identifying U.S. Customary units of length, weight, and capacity) was not covered. For all other standards, the items covered the most important topics.
- There seemed to be a heavy emphasis on being able to add and subtract whole numbers up to three digits. At third grade, this is a recall level and three to five questions should determine the student's proficiency level. Additionally, a number of problems were devoted to rounding to the nearest ten or hundred. While important to insure that the student remains proficient with this skill, it again would seem fewer questions would determine this. Although a number of the questions covering both of these skills (adding and rounding) used money as the basis, it was not really an assessment of a student's understanding of money but of the skill of adding or rounding whole numbers.
- Although the number items involving operations seemed to be high, this is a significant part of the work at this grade level. I would have expected more on computation in contexts and a wider level of types of computation. The other area that was weak fraction concepts. A very limited look at fractions (that of "out of" or ratio meaning) was all that was assessed. Students should have more opportunity to learn about fractional parts of area, length, sets where a fractional part is linked to something like equal shares. On the other hand, there was an over emphasis on the one probability objective. Measurement was greatly slighted. Only one item on using a ruler. The money objective was not clear enough to know whether it really included adding money (in decimal form) and solving other problems of this type. Many of these problems are not truly measurement, but just numbers.
- I thought the measurement standard should have more questions on telling time. I also think that 3.M.1.3 should be covered. The measurement strand needs more questions.

B. For each standard, did the items cover the most important performance (DOK levels) you expected by the standard? If not, what performance was not assessed?

- The items were all written at the lower DOK levels, those addressing memorized and procedural knowledge. There was no attention on the assessment, and little attention in the standards, to students' skills in reasoning, critical thinking, or conceptual knowledge. There are many important concepts students should be developing at this grade level but they are not reflected in either the standards or the assessment items.
- Strategic thinking was not assessed in this test.

Table 3.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 3

- No, the algebra and the Geometry standard did not have the DOK levels that were expected. Conceptual understanding, explanations, and procedures are very hard to assess, but these are what the standards call for to attain the desired DOK level.
- There were no questions that were covered by a DOK level of a 3. Standard 3.S.1.1 could possibly have an item that was assessed by a DOK 3 instead of a DOK 2.
- All the questions seemed to be at a 1 or 2 DOK level. This requires very little thinking or reasoning on the part of the student. However, it is also difficult to measure more in-depth "strategic thinking" with a multiple choice test.
- There was an abundance of level 1 items, very few level 2 and no level 3. While it may be appropriate not to have many level 3 items, there should be fewer items and more level 2 items.
- I think the DOK of the questions should have been higher for the standards, because they did not match the content standard DOKs that they wanted.

C. Were the standards written at an appropriate level of specificity and directed towards expectations appropriate for the grade level?

- The standards were written at a very specific level. Most of the concepts appropriate to this grade level were reduced to memorized knowledge, e.g. the relationships between operations, perhaps as a result of the desire to make the standards very specific.
- Yes, for the most part.
- Yes. There was only one item that may have been too "wordy" for the grade level.
- It seems that many of the 3rd grade standards are also written at lower DOK levels. Does this say something about lower expectations for students or does it say something about writing standards to fit multiple choice test?
- The objectives are really vague on problem solving with whole numbers including division problems. The one objective in algebra on division is really a number objective with a slight emphasis on division and multiplication being inverse operations.
- It seemed like most of the questions dealt with memorization facts/algorithms. Questions need a few more higher level questions.

D. What is your general opinion of the alignment between the standards and assessment:

- ii. Acceptable Alignment (2) : 29%
- iii. Needs slight improvement (5) : 71%

E. Comments

- This is a very long test for students at this grade level. Eliminating some of the weaker items that assess rounding, and whole number computation, and similarity and congruence would improve the test and shorten it as well.
- I believe there are too many items on this assessment. I think we could delete some items

Table 3.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 3

from the number sense strand (rounding) and objectives S.2.1,(probability certain or impossible) and G.2.1(similarity and congruence) I also think that the algebra strand on the standards has DOK levels that are too high for the objectives.

· The improvement mainly comes on the match of emphasis on certain objectives.

Everything is rather treated (except for measurement) as the same grain size of objective.

This does not reflect the usual emphasis in the curriculum at this grade level.

Table 4.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 4

A. For each standard, did the items cover the most important topics you expected by the standard? If not, what topics were not assessed that should have been?

- The commutative property of addition and multiplication was only assessed with one item, as was the skill of adding and subtracting decimals. I would have expected those topics to receive more attention at this grade level. Additionally, the skills of determining the median and the range of a set of data were not addressed, even though that standard received the most attention of all of the standards. There was also more attention than I would have expected to problems with money.
- This assessment does not include questions on range and median. It also is lacking questions that ask students to compare values of mixed numbers - 4.N.1.3 Standard 4.N.1.1 only has one question requiring students to read and write word names. It did not test large numbers.
- Yes, I think that all of the standards were covered very well. However, range and median were not on the assessment anywhere but are on the standards under s.1.2.
- Standard 4.S.1.2 tested mode twice, however did not test median or range. There was also an item on mean, however this was not mentioned in the standard at all.
- There seemed to be a number of standards where one or two questions were asked while other standards (4.A.3.1 and 4.S.2.1) were overloaded with lower level DOK questions.
- There were no items that tested range or median. Very little on fractions, adding and subtracting decimals (but with a calculator why would you assess much on these), little on measurement such as estimating length.
- There were no questions on median and range for the standard 4.S.1.2. They just had questions that dealt with mean. For the questions dealing with the standard 4.G.2.2 it only dealt with identifying a slide which is an obvious choice for kids because they have not done anything with rotation and reflection. Can these be added to the standard?

B. For each standard, did the items cover the most important performance (DOK levels) you expected by the standard? If not, what performance was not assessed?

- The DOK levels of all of the items were only levels 1 and 2. There was no attention to measuring students' ability to solve non-routine problems, to do critical thinking, or to their ability to extend beyond just procedural or memorized mathematics.
- This assessment had too many Level 1 questions. The translation problems were too easy for objective 4.G.2.2
- Yes, for the most part the DOK levels were appropriate. The algebra strand may have been a little low. It would also be nice to see some level 3 questions on this assessment.
- Standard 4.S.2.1 was written at a DOK 2, however all 6 problems were tested at a DOK 1.
- Standard 4.A.3.1. and 4.S.2.1. had a high number of questions for this standard, however the DOK level was low (1) for all of them. It would seem half the number of questions could have been asked with some requiring a higher level of DOK.
- Although this assessment seemed to have more Level 2 items than grade 3, there were few that really pushed the thinking. There were no Level 3 items.

C. Were the standards written at an appropriate level of specificity and directed towards expectations appropriate for the grade level?

- The standards were very specific, including a limiting listing of specific concepts within a topic. There were issues on the assessment that arose from the very specific nature of the standards. For example, the statistics standard includes only median, mode and range rather than a generalized "measures of central tendency" making inclusion of mean on the assessment problematic. Another example is the precise distinction between when students will work with expressions and when they will work with number sentences.
- Yes. In some cases, however, the specificity of the standards caused a non-alignment with the test item.
- I thought that some standards were too specific, since some of the items were written outside of that specificity (ex: mean, fractions). There were a couple problems that I thought were written at a level that was too easy for 3rd grade (item #2 and some rounding questions).
- There seemed to be a number of problems that specifically addressed 3rd grade (see notes) standards without involving a continuation of 4th grade standards. Students were expected to answer a question about mean which they have not been introduced to according to the standards. However, no where in the test are they assessed about median and range. Additionally, there did not seem to be any questions on improper fractions or questions specifically addressing mixed numbers.
- The expectations were not always clear and often not inclusive of the ideas being assessed. For example, divisible, prism, triangular prism, and other vocabulary was used that was not specifically mentioned in the objective. One other prominent example was the use of likely events; the objective specifies equally likely. When does a even qualify for being likely???? The measurement objectives does not include knowing equivalences; yet this was tested. There is little on solving word problems with the four operations.
- There was no standard that dealt with substitution and there were some problems that had substitution in them.

D. What is your general opinion of the alignment between the standards and assessment:

- iii. Needs slight improvement (7) : 100%

E. Comments

- This test seems too long for students at this grade level. There were some standards that were addressed six or seven times, when four or five might be sufficient.
- There are too many items on this test. I believe that 5 or 6 items per strand would be sufficient.
- I thought that this test was a bit too lengthy for this grade level. For example, standard

Table 4.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 4

4.A.3.1 had 8 items, which I believe it far too many for one standard. Also, standard 4.S.2.1 had 6 items and it was devoted simply to "equally likely or not equally likely outcomes."

There were approximately 8 items that did not fit with a standard (either the concept wasn't mentioned or the standard was too specific).

- The improvement needs to be in the description of the objectives and the quality of the items===more than in the alignment.

- There were too many questions for the standard 4.S.2.1 on probability. The measurement standard M.1.2 and standard A.4.1 were too close to choose sometimes. It was hard to figure out if the standard wanted unit rate answers or if it wanted pattern identification.

Table 5.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 5

A. For each standard, did the items cover the most important topics you expected by the standard? If not, what topics were not assessed that should have been?

- The items did not address transformational geometry (turns or flips). There were no items measuring finding prime or composite numbers or factors of whole numbers. There were no items addressing squares of numbers, and none addressing multiplication and division of decimals that were not also money problems. These are all topics I would have expected based on the standards to be assessed at this grade level. There was extremely heavy attention given to the standard on writing one-step equations and solving them, on problems with money (which was very heavily measured in previous grades as well), on solving problems with estimation, and on analyzing data.
- No, there were too many problems for some standards (5.M.1.3 and 5.S.1.1) and no problems for others such as determining squares, multiplying and dividing by decimals, finding primes, composites and factors of whole numbers. These are important concepts.
- For the most part, yes. There were too many item that were about money. If they were supposed to be about decimal computation then they need to be in another context other than money. There were also no items for standard N.2.3 or N.1.2. or G.2.2.
- 5.N.2.3 (multiplying and dividing decimals by natural numbers) was not covered in this test. 5.N.1.5 (determining the squares of numbers 1-12) was not covered on this test. 5.N.1.2 (finding prime, composite, and factors of whole numbers) was not covered on this test. 5.G.2.2 (rotations and reflections) was not covered on this test.
- There seemed to be a lot of items that covered 5.M.1.2 - perhaps more than necessary. I did not notice any questions that addressed turns or flips (rotation or reflection.) Additionally, there appeared to be few questions addressing fractions - determining equivalent fractions (5.N.2.2.) or multiplying and dividing decimals (5.N.2.3) 5.N.1.5 was not addressed (determining squares of numbers.) 5.N.1.2 (finding prime, composite numbers and factors of numbers did not seem to be addressed.
- There is little variation in the items. Many are only a slight variation of the other when there is a lot of items that could be testing different aspects of an objective. There was little on understanding numbers (fractions and decimals at this level), little on problem solving.
- Standard S.1.1 had a lot of questions with interpreting data from graphs but very little questions on S.1.2 and S.2.2. These standards had one question each. Standard 5.N.1.2 had no questions dealing with prime or composite. Standard M.1.2 is too heavy on the money problems and some of the other standards under measurement should have had more questions. For example standard M.1.3 there was only one question on converting and this standard should have more. Standard 5.M.1.1. only had one question and that deals with elapsed time. The standards under number sense needed to have more questions for this strand. The test was very weak in this area. Because of the money questions in M.1.2 it was hard to place them in the number sense strand where they maybe should have gone.

Table 5.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 5

B. For each standard, did the items cover the most important performance (DOK levels) you expected by the standard? If not, what performance was not assessed?

- The items in the area of statistics and probability were mostly lower DOK levels than expected based on the standards. In general, strategic thinking was not addressed in either the standards or the assessment items. It is important for students to have the opportunity to develop and demonstrate skills in strategic thinking, critical problem solving, and conceptual development. These standards and assessment items do not allow for that.
- Again, for the most part. Standard S.1.1 on statistics is at a DOK level 4 on the standards. It is nearly impossible to reach a level 4 on this type of assessment, I don't know how you would do that.
- Standard 5.G.2.3 states that students are to use coordinate grids to represent figures. Question #7 asks students to translate a figure on the coordinate plane and it is at a DOK of a 2. The standard only states this to be a DOK 1. Standard 5.S.1.1 could be assessed up to a DOK 4 and there were only 5 questions that were all assessed at a DOK 2.
- The DOK levels seemed to be at a higher level than the previous grades' (3 & 4) tests. However there still seemed to be a number of questions included that were at a lower DOK and/or grade level.
- This had more level 2 items--but they were very low level 2.

C. Were the standards written at an appropriate level of specificity and directed towards expectations appropriate for the grade level?

- These standards were written at a very specific level, at times too specific. This level of specificity can complicate assessment and restrict instruction.
- Sometimes the standards were written with too much specificity. For instance, the symmetry one (5.G.2.1) which stated students were supposed to find lines of symmetry for only 3 figures.
- Some of the standards were too specific and didn't allow any room for deviation of any kind. (symmetry of only specific shapes for example). I thought they were appropriate for this grade level.
- Standard 5.S.1.1 is very specific as to which type of graphs are covered. A circle graph was tested and is not listed in this standard. Standard 5.S.1.2 is specific to finding the mean. It should be broader to include all measures of central tendencies (median, mode and range).
- Some standards are written with so much specificity it is difficult to align test questions that do not meet exactly that specificity.
- The objectives are getting more obtuse. Some are so specific that they limit the intent of the standard.
- Sometimes the standards were written too specific and it was hard to find a place to put the questions. Standard N.2.1 was too specific in saying you need 2 digit divisors and said nothing about 1 digit divisors. Standard 5.N.1.3 was very specific on identifying certain fractions and it limited itself to other fractions. Standard 5.S.1.1 talked about bar graphs, line graphs, pictographs and line plots, but not about circle graphs. There was a problem

Table 5.15
Debriefing Summary
South Dakota Mathematics 2008 Grade 5

with a circle graph in it.

D. What is your general opinion of the alignment between the standards and assessment:

iii. Needs slight improvement (7) : 100%

E. Comments

- This test is too long for students at this grade level. Removing some of the six or seven items on those heavily tested standards would shorten the test, making it more appropriate for this age student. There are also a number of items that need revision to make the test more mathematically sound, and to make the items of higher quality.
- There needs to be a better balance between the standards and assessment. There are too many questions for some standards and no questions for other standards.
- I thought this assessment was too long. How many sessions would the students have to complete this test? If given in a single day, they would be just marking answers by the end of the test to be done with it. The number of items for some of the standards needs to be adjusted...fewer for some and more for others.
- The standard 5.M.1.2 (solving problems involving money, especially unit price) was heavily focused on. The standard 5.N.3.1 had 8 items, which is far too many for one standard. I felt that the standards limit themselves and should be more general when it comes to computation.
- The content of the way the standards are written should be addressed and possibly clarified or rewritten.
- The alignment is off because of the wording of the objectives and the over emphasis on some rather trivial objectives (the probability one at this level). There is also an over-emphasis on translations problems (writing an algebraic equation or expression) for a problem.
- Should just have a section on the test dealing with number sense. It is really hard to see if the students are growing in that area.

Table 6.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 6

A. For each standard, did the items cover the most important topics you expected by the standard? If not, what topics were not assessed that should have been?

- There were no standards that were not addressed, although there were topics within some of the standards that were not assessed. For example, the standard addressing using basic shapes to demonstrate geometric concepts includes the topics of symmetry (assessed twice), congruence (assessed once), similarity (not assessed), perpendicular (assessed once), parallel (not assessed), and reflections (not assessed).
- Yes, the items did a good job of covering the standards for this level. The standard A.1.2 and A.3.2 maybe have too many items.
- In standard 6.G.2.1, similarity wasn't covered on the test. Also, the standard would like students to identify a reflection, but only a translation was tested, which is not mentioned in the standards. For standard 6.M.1.1, students were never asked to convert measurements within the metric system. There weren't very many conversions between fractions, decimals, and percents (standard 6.N.1.1).
- There were a lot of questions that were under 6.A.1.2, 6.A.3.2, 6.G.1.1. So the question is were the questions actually written for these standards or were not written well enough for them to be placed under another standard. There did not seem to be any questions assessing student knowledge of prime and composite numbers.
- There is not sufficient coverage of solving problems involving numbers. Most of them were rate problems. Area items were very simple--about fourth-grade level in most states. Statistical items were sparse and at a low level. It does not appear that much progress is being made on these topics.
- For standard S.1.1 they need to add a few more questions on mean, mode and range. For standard N.1.1 there needs to be more questions on representing and converting between fractions, decimals and percents.

B. For each standard, did the items cover the most important performance (DOK levels) you expected by the standard? If not, what performance was not assessed?

- For the most part, the items covered the DOK expected by the standards--the lower DOKs that measure only memorized and procedural mathematics. Neither the standards nor the assessment items addressed DOK level three--strategic thinking. There are many important concepts and critical thinking skills that are not addressed and are appropriate for students at this grade level.
- Yes, the DOK levels were appropriate for most of the items.
- Standard 6.S.2.1 should only be assessed at a DOK 1, however the exam has all questions at a DOK 2.
- It seemed as if the questions given required students to perform at the required DOK.
- There were more level 2 items, but most of these occurred in the writing of algebraic expressions to represent a situation. There were few extended problem solving opportunities so most of the problem solving was at level 1.
- I think the probability questions should have DOK of 2 and not 1.

C. Were the standards written at an appropriate level of specificity and directed towards expectations appropriate for the grade level?

- The standards are very specific and basically appropriate for this grade level. There was some confusion about two standards that seem to both address the same specific skills-- computation with decimals. There wasn't a clear distinction between the two standards.
- Yes... Standard 6.s.2.1 should include finding the number of outcomes.
- The standards were written at an appropriate level of specificity. Standard 6.S.2.1 (probability) might have been too specific, due to the fact that some questions dealt with outcomes, instead of simply finding the probability of a simple event.
- There were a few questions that were given that were at a lower grade level but not as many that seemed to appear in the previous grades.
- The standards were specific enough that most items could be classified unless they were below grade level. One exception was in statistics.
- Standard G.2.1 was too specific when it said identify only a reflection.

D. What is your general opinion of the alignment between the standards and assessment:

- (1) : 14%
- ii. Acceptable Alignment (4) : 57%
- iii. Needs slight improvement (2) : 29%

E. Comments

- This test was very long. There were a total of 37 items across five of the standards--four of them algebra standards and one geometry. In general there was heavy emphasis on algebra and light emphasis on the other areas, with the exception of the one geometry standard.
- This test is still too long, but aligns nicely with the standards.
- I felt that this test more accurately assessed the standards (with the exception of probability). I did feel that standard 6.A.1.2 (7 items) and standard 6.A.3.2 (9 items) were too heavily tested.
- There is minimal coverage of all the objectives---there is a problem in my mind of different grain size of objectives---some deserve more attention than others.
- Standard A.3.2 had 8 questions for that standard. Standards A.1.2 and 2.1 also had 7 questions each. It seemed pretty consistent in the algebra strand Overall all though I thought the test had a good number of questions for each strand.

Table 7.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 7

A. For each standard, did the items cover the most important topics you expected by the standard? If not, what topics were not assessed that should have been?

- There were items assessing most of the standards but not all of the topics within the standards. For example, there was minimal use of negative integers in the assessment items, whereas they were specifically listed in many standards indicating students are commonly using negative numbers at this grade level. Also, many of the items addressing standards directed to use of fractional numbers instead used decimal numbers, so even though there were a number of items assessing those standards, they did not measure students' skills with fractional applications. There was disproportionately heavy emphasis on the standard addressing one-step patterns in algebra, on geometric transformations, on computation, and on probability. There was relatively even attention across the broad topics of algebra, geometry, number sense, and statistics and probability. There was relatively less attention to the broad topic of measurement.
- No, Standard 7.G.1.2 had only 1 assessment item but contains several elements of geometric figures. In the number sense section, there were too many problems assessing standard 7.N.2.1 but few assessing 7.N.3.1 problem solving. There were no items assessing inequalities on a number line. There were no items assessing area and circumference of circles. There also are no questions on converting within the metric system. The measurement area was weak.
- Yes, the items covered the standards very well. Measurement could have used a few more items. There were no items that asked for the student to find a radius or a diameter .
- In standard 7.A.3.2, I thought that there should have been an item assessing "better buy." In standard 7.G.1.2, there were no questions dealing with vocabulary, such as altitude, midpoint, bisector, radius, etc. In standard 7.M.1.2, students were never asked to find the area of a figure or circumference of a circle. There were formula pages in the booklet and they were never used. This might be a distraction to students if the formula pages are never used.
- There did not seem to be a lot of problems using negative numbers. Additionally there were not any problems regarding circumference, areas of a circle, triangles, trapezoids and other shapes. There seemed to be only one question regarding elements of geometric figures. Otherwise, there seemed to be a good spread across the standards.
- The number strand is rather weak in true problem solving. A lot of emphasis on geometric transformations that are rather routine for this grade. The great emphasis on modeling situations found in grades 5 and 6 was not found in this level; in fact, there were very few items. The measurement strand does not contain assessment items for area of circles, combinations of shapes, or irregular figures.
- Standard M.1.2 could have had more questions with as many important concepts that are in this standard. There was a formula sheet given to the students but there was not a problem that really required them to use them except for rectangles or squares. There were no problems on using formulas for circles, trapezoids or triangles. Standard G.2.1 was very heavy on transformations and G.1.2 had only one question on elements of figures which is important. Standard S.1.1 needed a few more questions on mean, median, mode and range. Standard S.1.2 was very heavy on reading scatter plots.

B. For each standard, did the items cover the most important performance (DOK levels) you expected by the standard? If not, what performance was not assessed?

- The DOK levels expected by the standards were covered by these items for the most part. There was no attention in either the standards or the assessment items to critical thinking, strategic problem solving, or conceptual knowledge--DOK level 3. There are many important concepts for students at this grade level that are not addressed in a set of standards and assessments that focus only on memorized knowledge and procedural mathematics.
- Overall the test seems rather easy for 7th graders.
- Yes, for the most part. The algebra standards for A.1.1 and A.2.1 are at a level 2 on the standards, but most of the items were at a level 1. Also, there needs to be some tweaking of the standards to include some equations in standard A.1.1 rather than just expressions.
- For the most part, the items covered the correct DOK levels. In standard 7.N.1.1, the questions were all assessed at a DOK 1, whereas they could've been assessed at a DOK 2.
- Some of the questions that addressed a standard with a DOK of 2 were only of a DOK 1 or seemed fairly easy for a 7th grade student.
- Although the measurement objectives were classified as level 1, at grade 7 more thinking should be required and the assessment should push the students' thinking. Most of the level 2 were rather routine.

C. Were the standards written at an appropriate level of specificity and directed towards expectations appropriate for the grade level?

- The standards were written very specifically. The limiting of the number type to just fractions and integers in many of the standards seems problematic when students have been working with decimals in the previous grades. The limiting of some algebra standards to just expressions or just equations seemed also to be problematic. For example, replacing a variable with a given value in an equation is essentially the same skill as it is in an expression, yet the standards limit that skill to just expressions.
- Sometimes I feel they were written too specific. For instance 7.A.1.1 states evaluate algebraic expressions and should probably say expressions and equations.
- Yes, some of the standards are maybe too specific. Such as N.2.1 only addressed integers and fractions. Should decimal fractions also be included in this? If not, then where should they go? They are appropriate for this grade level.
- I thought that overall, the specificity was appropriate. In standard 7.S.2.1, the standard should have mentioned "expected outcomes" instead of simply "finding probability." Also, there were multiple problems that dealt with decimals, however, no standards mentioned using this skill (they all worked with fractions and integers). Also, in standard 7.S.1.2, scatter plots may need to be added to the list of possible graphs. They were tested multiple times, but were not mentioned in this standard. There were multiple questions which focused on using "numeric" expressions, when the standards 7.A.1.1, 7.A.2.1, and 7.A.4.1

Table 7.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 7

only address "algebraic" expressions. Lastly, I found that in standard 7.A.1.1 was tested with some items that addressed algebraic equations, when the standard is only supposed to address algebraic expressions.

- There were a number of problems such as ones using decimals that did not fit the standard because the standard specified fractions and integers. Additionally there were a few problems that really fit with 7.A.1.1 under the 'replacement of values for variables' but the problem gave an equation and the standard specified expressions.
- Noted in the notes for items, several objectives did not clearly contained the type of item that was assessed---exponents, expected value, clarity of expression vs equation.
- Standard S.1.2 should state make predictions from data and analyze data from a graph otherwise it limits this standard.

D. What is your general opinion of the alignment between the standards and assessment:

- ii. Acceptable Alignment (1) : 14%
- iii. Needs slight improvement (6) : 86%

E. Comments

- There were two general issues needing attention--algebraic vs numeric expressions, and equations vs expressions. Algebraic expressions should be distinguished from numeric expressions, and equations should be distinguished from expressions. The assessment items did not address those distinctions adequately.
- This assessment has too many items. It would be very difficult for a 7th grade student to keep their attention on the task for this many items.
- All standards were represented in this exam. However, five standards were assessed with 7 items and one standard was assessed with 8 items. There were multiple standards that were only assessed with 1 item, so I thought that the test items could have been more spread out amongst the standards. I also felt that the measurement strand was extremely weak, meaning there weren't many items devoted to assessing these skills.
- Although the results will probably look aligned, many of the objectives are rated at level 1 that should be pushed to level 2 at this grade. It is maintaining a low-level advancement of sixth grade. (The sixth-grade test requires more thinking than this one).
- The measurement standard was weak and there needed to be more questions in this area. Standard A.1.1 deals only with algebraic expressions and you could also add equations here when you deal with replacement values. The formula page was given to the students but there weren't any questions that needed it and this may stress the students. A huge concept is missing here. I thought the test was very weak in the use of integers as this is a major focus in 7th grade.

Table 8.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 8

A. For each standard, did the items cover the most important topics you expected by the standard? If not, what topics were not assessed that should have been?

- Each standard was assessed at least once, but there was heavy emphasis on just three standards. Cutting out some of the items on those standards (8A11, 8N31, and 8S21) would shorten the test.
- Yes, but the algebra strand has way too many items (29), especially the equivalent expressions (A.1.1) Also, the number sense strand has too many items (21).
- In standard 8.A.1.1, the bulk of the questions dealt with determining if two algebraic expressions were equivalent, which was only a small part of the standard. For standard 8.N.2.1, there was one question out of six that dealt with the specificity of the standard (discount, markup, commission, profit, and simple interest). The other five questions dealt with computing rational numbers.
- There seems to be a heavy load on standards 8.A.1.1 and 8.A.2.1 but in each case the problems seems to be of the same type with a high emphasis on equivalent expressions under 8.A.1.1 and solving equations under 8.A.2.1.
- Proportional reasoning is slighted. It occurs in two places in the objectives, so it being slighted is rather lost in the analysis. The objectives are broad, so many things fit under each one. The geometry ideas did not move forward (only more on 3-d, but rather low level).
- Standard A.4.1 only had question and I think that this standard needs more. Standard S.1.2 could have had a few more questions on analyzing data from graphs and making predictions.

B. For each standard, did the items cover the most important performance (DOK levels) you expected by the standard? If not, what performance was not assessed?

- The test and the standards address only the lower two DOK levels. It is important for students to have the opportunity to learn and to show that they have learned how to do critical thinking and strategic problem solving in mathematics.
- I would have liked to see some higher DOKs.
- Yes, overall the DOK levels were very appropriate. I think the levels on A.2.1 may be too high on the standards. Most of the items on the test were just substituting a number in for a variable and finding the result. I don't think this is a level 2.
- Standard 8.S.1.1 states that students can find measures of central tendencies from a graph. It lists that standard as a DOK 1, however the questions are at a DOK 2 (ex: reading a graph, then finding the mean).
- The 8th grade standards are all rated at either a DOK 1 or DOK 2. This still seems low for the 8th grade level. While it is sometimes harder to assessment a DOK level of 3 on a multiple choice test, it is possible. There were a number of problems that required the student to perform at a DOK level of 2 to correspond with the expectations of the standards. Perhaps more needs to be done in-state with the standards to raise the level of DOK.
- There appears to be a better range of levels; however, by this grade there should be more

Table 8.15

Debriefing Summary

South Dakota Mathematics 2008 Grade 8

of a push toward level 3 thinking. I know this is difficult to do on multiple-choice tests, but every effort should be made to include such items. It can be done. The geometry objective was classified at level 1--but it should be pushed to level 2 at this grade

C. Were the standards written at an appropriate level of specificity and directed towards expectations appropriate for the grade level?

- The standards were very specific and for the most part appropriate for this grade level.
- Why did the measurement limit finding area, volume, and surface area to whole numbers when students are allowed to use calculators? In real life, measurement problems aren't limited to whole numbers!
- Some of the standards are too specific and limit the coding. S.1.1 says that we can only find a measure of central tendency from a stem and leaf plot or a line plot. M.1.2 says we can only find surface area of rectangular prisms and cylinders. I think some of these need to be broadened a little.
- Standard 8.M.1.2 was specific to only include surface area of rectangular prisms and cylinders, however there was an item that asked students to find the SA of a pyramid. Standard 8.S.1.1 was also specific to only include finding the mean from a stem-and-leaf plot or line plot, however there was an item that asked students to find the mean from a data set. Standard 8.S.2.1 was specific to include computing probability and finding sample space, however there were multiple items that asked students to use the fundamental counting principle. The standard may need to be broadened to include that concept as well.
- Standard 8.A.1.1 seems to have a discrepancy: In the first part it states '1st degree algebraic expressions,' yet under the bullets it discusses 'exponents' which is no longer a 1st degree expression. There seems to be some question about the specificity in standards 8.G.2.1 and 8.M.1.1. Both are about proportional reasoning and solving proportions, but 8.G.2.1 refers only to similar quadrilaterals and triangles, while 8.M.1.1 refers to solving measurement problems with rational number measurements. Also, perhaps this standard (8.M.1.1) would be better under algebra.
- Only a few concepts or skills were tested (combinations) that did not have a clear home in the objectives.
- Standard S.1.1 is too specific for finding the mean, median, mode and range of a data set from a stem and leaf plot and line plot. You should be able to find mean, median, mode and range from any form of data set. Standard M.1.2 is too specific. The standard states that students are able to find area, volume and surface area with whole number measurements and should be changed to subset of rational numbers so you can include decimals in the problem.

D. What is your general opinion of the alignment between the standards and assessment:

- ii. Acceptable Alignment (4) : 57%
- iii. Needs slight improvement (3) : 43%

E. Comments

- It appears to me that most of the assessment items in all these tests measure low DOK levels because they are so typical of traditional textbook items. South Dakota needs to think about the mathematics that students will use in real life and write standards that will address those needs and assessments that will measure those needs. In real life problem solving isn't so neat and tidy. You need to be helping your students think and reason. Most of the items don't require students to do much more than use rote procedures.
- All of the standards were covered by the assessment, but I think the test is too long. There was much better use of integers on this assessment
- The test weighed heavily on algebra, with 28 of the items being devoted to this particular strand (3 standards had seven or eight items). Measurement was quite weak, with only 8 questions being devoted to this strand. However, each standard was assessed with at least one question. The number sense strand also had 2 standards with seven or eight items.
- The alignment looks ok, but there is concern about the geometry and rather routine statistical applications.
- Possibly look at putting standard G.2.1 which is writing and solving proportions in the algebra strand instead of the geometry strand. Measurement strand could be beefed up especially 8.M.1.1 with using proportional reasoning to solve measurement problems. The algebra strand was hit really hard. There were 28 questions dealing with this strand.

A. For each standard, did the items cover the most important topics you expected by the standard? If not, what topics were not assessed that should have been?

- Although all of the standards were assessed at least once, some of the topics within the standards were not. For example, there were no items involving quartiles, and the graphs were of the same type. There was heavy emphasis on symbolic manipulation with algebraic expressions and on numeric problem solving. These standards could be adequately assessed if some of those items were eliminated. That would shorten the test and make it more accessible to students.
- Assessment on measurement is weak - not very many items are included. Geometry is also weak. There were no items that assessed graphing inequalities on a number line. There were no items requiring students to calculate slope. No items assessed line of symmetry. I also don't recall any order of operations items.
- There appears to be good coverage of all of the standards.
- Standard G.2.2 didn't address symmetry or coordinate plane, only transformations.
- There seems to be an abundance of questions around N.2.1 and I am unclear as to whether it is from all of those actually being questions about N.2.1 or if it is a catchall for problems I was unclear about where they belonged.
- The test was heavy on symbolic manipulation of algebraic expressions without much emphasis on the rest of algebra (with the exception of ideas about slope). The measurement strand was minimal coverage with very few items. The scope of the curriculum that this test covers is very broad. It is the only assessment that needs this many items to begin to cover the territory.
- Standard N.2.1 and 3.1 were heavy on the questions. Standard N.1.2 only had one question and could have had one or two more.

B. For each standard, did the items cover the most important performance (DOK levels) you expected by the standard? If not, what performance was not assessed?

- The assessment items and the standards both covered only the lower two DOK levels. There are many important concepts and critical thinking skills accessible and appropriate to students at this grade level that are not being addressed. Since these students will soon be leaving high school, it seems like it would be desirable to include these aspects of mathematics, since they are more likely to be useful to students outside the academic world of K-12 education than memorized and procedural mathematics.
- The algebra items seemed to be at a low DOK level.
- The DOK for many of the algebra items are set too high on the standards. Many of these items on the test are procedural which is hard to give a DOK 2 for these items.
- Most standards were underassessed when it came to DOK levels.
- There seemed to be a lot of lower level questions regarding solving for a variable, simple multiplication and simple determination of median and mode.
- The measurement objectives were mainly classified as level 1. At this grade, it should be a culmination and at least at level 2.

C. Were the standards written at an appropriate level of specificity and directed towards expectations appropriate for the grade level?

- The standards were appropriately specific for the most part. There should be more specificity in the standards around the practical applications of percentages that students are more likely to need to know as adults. There is no mention in the standards to substituting values for variables in formulas, although the skill appeared often in the assessment and would be useful to students as they use common formulas.
- Yes as far as grade level. I think some of the standards are too specific and leave out some items that should fit in that standard.
- Standard S.1.2 was too specific to only comparing data sets using measures of central tendency. Many questions asked students to find the mean, median, or mode of only ONE set.
- Most of the questions were at an appropriate level based on the DOK level expected by the standard.
- The only large hole is the lack of attention to growth problems and to percent objectives---these are practical applications at this grade and needed for the life of the citizen.
- The statistic S.1.1 I thought was below grade level and more higher level questions could be placed here. A.2.1 S.1.2 should state compare multiple variable data sets or find mean, median, mode and range in 1 data set. Standard A.2.1 states that students are able to use algebraic properties to transform multi-step, single variable, first degree equations and there was a question that dealt with one step equations.

D. What is your general opinion of the alignment between the standards and assessment:

- ii. Acceptable Alignment (3) : 43%
- iii. Needs slight improvement (4) : 57%

E. Comments

- Since students taking this test will soon be leaving high school, it is important that they understand the usefulness of mathematics in their adult life. Emphasizing memorized knowledge (which is soon forgotten) and procedural knowledge (which is often not practical) with the exclusion of concept development and mathematical reasoning is not equipping students with the kind mathematics that is lasting and empowering to them as they leave the K-12 environment. When these standards are revised, these issues should be considered.
- There are many assessment items for some standards. It seems that a more equal distribution of items among the standards would allow for a shorter test. All of the

math tests were too long. Students must experience assessment fatigue by the time they finish 90+ questions. Are you assessing stamina or mathematics? Also, most of the items measure a low DOK. Both standards and assessments need to better address NCTM's reasoning and problem solving process standards.

- This test is too long.
- Standard M.1.2 was not found on this test.
- Once again, the alignment is there---but need to think about the depth of thinking expected. Much of this is school mathematics and not the type of thinking that will be needed for the future, everyday person. This can be nicely combined with the mathematics that students will need for advanced study.
- It would be nice to add a standard where the students have to write algebraic expressions. The test was extremely long. Can we assess with fewer questions.