

REPORT

Alignment Analysis of Mathematics Standards and Assessments Using the Operational Forms West Virginia Grades 3, 4, 5, 6, 7, 8, and 10

**Norman L. Webb
December 21, 2003**

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This study is one of the three alignment studies conducted for the State of West Virginia. The Alignment Analysis Institute was held November 10 and 11, 2003, in Charleston, West Virginia. This analysis used data from a prior analysis conducted July 14-16, 2003. The report consists of a description of the four criteria used to judge the alignment between West Virginia standards and WESTEST, with field test items in mathematics and the tables listing the results from the analysis of the coding by eight reviewers. In addition, personnel in the Office of Student Assessment Services were given electronic files that contained supplementary information.

Acknowledgements

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The West Virginia State Department of Education funded this analysis. Brenda West, Assistant Director, Office of Student Assessment Services, was the main contact person for the Department and oversaw the coordination of the study.

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Executive Summary

This is a report of the results from a two-day Alignment Analysis Institute that was conducted November 10 and 11, 2003, in Charleston, West Virginia. Eight people, including state assessment consultants, content experts, district mathematics supervisors, and mathematics teachers analyzed the agreement between the state's mathematics standards and assessments. Four of the reviewers were from states other than West Virginia and four were from West Virginia. This analysis of the West Virginia operational tests and curriculum standards in mathematics for seven grades indicates that the alignment is reasonable and good. At each grade level, there are a sufficient number of items to judge attainment of a standard, and these items are adequately distributed among the objectives to measure a range of the required knowledge under each standard. For nearly all of the standards across the seven grades, the items matching objectives are distributed fairly evenly. The depth-of-knowledge (DOK) levels of a small number of items, mainly those relating to Data Analysis and Probability standards, were lower than the level of corresponding objectives. Thus, the Depth-of-Knowledge Consistency criterion was not fully met for the Data Analysis and Probability standard for five of the seven grades. The number of alignment issues was low and could be fixed by replacing at most four items on any of the test forms. It was concluded that the WESTEST assessments in mathematics for grades 3, 4, 5, 6, 7, 8, and 10 are aligned with the West Virginia curriculum standards.

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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 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 of Science Education (NISE) research monograph, *Criteria for Alignment of Expectations and Assessments in Mathematics and Science Education* (Webb, 1997).

A two-day Alignment Analysis Institute was conducted November 10 and 11, 2003, in Charleston, West Virginia. Eight people, including state assessment consultants, content experts, district mathematics supervisors, and mathematics teachers analyzed the agreement between the state's mathematics standards and assessments. Four of the reviewers were from states other than West Virginia and four were from West Virginia. This mix of people provided a balance of those without any prior knowledge of the standards with those who were familiar with the standards. The same eight mathematics educators served as reviewers for both alignment analyses. In mathematics, the alignment of standards and assessments was analyzed for seven grade levels. The reviewers analyzed one form of the operational test that was created with consultation between state assessment and curriculum staff and the testing vendor. Department of Education staff and people from the testing vendor selected items for the operational tests from test forms that were field-tested, using in their decisions, among other input, information from bias reviews, content reviews, and the results of the July 14-16 alignment analysis.

For the purposes of this analysis, we have employed the convention of standards and objectives to describe two levels of expectations for what students are to know and do. Standard is the most general. Each of the five standards are further subdivided into objectives. It is assumed that all of the objectives under a standard span the content knowledge expressed in the standard.

Reviewers were trained at the July institute to identify the depth-of-knowledge of objectives and assessment items. This training included reviewing the definitions of the

four depth-of-knowledge (DOK) levels and then reviewing examples of each. In November, the reviewers reviewed the definitions and examples of the four depth-of-knowledge levels, but did not undergo an extensive retraining because it was not required. The consensus depth-of-knowledge levels for the objectives determined in July were used for the November analysis. Thus, the reviewers did not have to judge the DOK levels of the objectives, but were able to begin with analyzing the assessment items. In November, the reviewers did spend some time reviewing the objectives and their DOK levels to refresh their knowledge of the objectives.

For the first two or three grade levels, before independently coding the items from each assessment, the reviewers independently coded a sample of three or five items from the assessment instrument. They then compared what they had assigned as the depth-of-knowledge level and the content objective to each item. In this way, the reviewers calibrated their coding of the DOK level and the assigned objective. The overall process is not designed for the purpose of enabling reviewers to reach exact agreement. To derive the results from the analysis, the reviewers' responses are averaged. Any variance among reviewers is considered legitimate, with the true depth-of-knowledge level for the item falling somewhere in between the two or more assigned values. Such variation could signify a lack of clarity in how the objectives were written, the robustness of an item that can legitimately correspond to more than one objective, and/or a depth of knowledge that falls in between two of the four defined levels. Reviewers were allowed to identify one assessment item as corresponding to up to three objectives—one primary hit (objective) and up to two secondary hits. However, reviewers could only code one depth-of-knowledge level to each assessment item even if the item corresponded to more than one objective. In addition to learning the process, reviewers were asked to provide suggestions for improving the process.

Reviewers were instructed to focus primarily on the alignment between the state standards and assessments. However, they were encouraged to offer their opinion on the quality of the standards, or of the assessment activities/items, by writing a note about the item. Reviewers could also 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. For example, a mathematics item that involves an excessive amount of reading may represent a source-of-challenge issue because the skill required to answer is more a reading skill than a mathematics skill.

The results produced from the institute pertain only to the issue of agreement between the West Virginia state standards and the state assessment instrument. This alignment analysis does not serve as external verification of the general quality of the state's standards or assessments. The results of the alignment institute do provide the evaluations of content area experts, half of whom are independent of the state. 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, which give one indication of the variance among reviewers.

This report describes the results of an alignment study of standards and grade-level operational tests in mathematics for grades 3, 4, 5, 6, 7, 8, and 10 in West Virginia. The study addressed specific criteria related to the content agreement between the state standards and grade-level assessments. Five criteria received major attention: categorical concurrence, depth-of-knowledge consistency, range-of-knowledge correspondence, balance of representation, and source of challenge.

Alignment Criteria Used for This Analysis

This analysis judged the alignment between the standards and the assessment 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 assessment 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 standard. The analysis assumed that the assessment had to have at least six items measuring content from a standard in order for there to be an acceptable level of categorical concurrence between the standard and the assessment. The number of items, six, is based on estimating the number of items that could produce a reasonably reliable sub-scale for estimating students' mastery of content on that sub-scale. Of course, many factors have to be considered in determining what a reasonable number is, including the reliability of the sub-scale, 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 standards or require students to achieve a specified cutoff score on sub-scales related to a standard. 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 standard, and as a basis for making some decisions about students' knowledge of that standard. 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 sub-scale.

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 standard, as judged in this analysis, at least 50% of the items corresponding to an objective had to be at or above the level of knowledge of the objective: 50%, a conservative cutoff point, is based on the assumption that a minimal passing score for any one standard 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 objectives. For example, assume an assessment included six items related to one standard 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 objectives, 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 objective. Some leeway was used in this analysis on this criterion. If a standard had between 40% to 50% of items at or above the depth-of-knowledge levels of the objectives, then it was reported that the criterion was “weakly” met.

Interpreting and assigning depth-of-knowledge levels to both objectives within standards and assessment items is an essential requirement 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. In science, a simple experimental procedure including one or two steps should be coded as Level 1. Other key words that signify a 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 as to 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. For example, interpreting information from a simple graph, requiring reading information from the graph, also is a 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 a Level 3. Caution is warranted in interpreting Level 2 as only skills because some reviewers will interpret skills very narrowly, as primarily numerical skills, and such interpretation excludes from this level other skills such as visualization skills and probability skills, which may be more complex simply because they are less common. Other Level 2 activities include 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 a Level 3. Activities that require students to make conjectures are also 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. An activity, however, that has more than one possible answer and requires students to justify the response they give would most likely be a 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 a Level 2. However, if the student is to conduct a river study that requires taking into consideration a number of variables, this would be a 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 have 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 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 standard 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 standard and an assessment considers the number of objectives within the standard with one related assessment item/activity. Fifty percent of the objectives for a standard 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 standard. This assumes that each objective for a standard 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 objective, the requirement that assessment items need to be related to more than 50% of the objectives for a standard increases the likelihood that students will have to demonstrate knowledge on more than one objective per standard 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 objectives. However, any restriction on the number of items included on the test will place an upper limit on the number of objectives that can be assessed. Range-of-knowledge correspondence is more difficult to attain if the content expectations are partitioned among a greater number of standards and a large number of objectives. If 50% or more of the objectives for a standard had a corresponding assessment item, then the range-of-knowledge criterion was met. If between 40% to 50% of the objectives for a standard 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 objectives within a standard hit (a standard with a corresponding item); it does not take into consideration how the hits (or assessment items/activities) are distributed among these objectives. *The balance-of-representation criterion is used to indicate the degree to which one objective 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 objectives for a standard that have at least one hit—i.e., one related assessment item per objective. The index is computed by considering the difference in the proportion of objectives and the proportion of hits assigned to the objective. An index value of 1 signifies perfect balance and is obtained if the hits (corresponding items) related to a standard are equally distributed among the objectives for the given standard. Index values that approach 0 signify that a large proportion of the hits are on only one or two of all of the objectives hit. Depending on the number of objectives and the number of hits, a unimodal distribution (most items related to one objective and only one item related to each of the remaining objectives) 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 objectives at least to some degree (e.g., every objective 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 language arts skill, 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

No changes were made to the content standards from the first alignment analysis in July and the second alignment analysis, with the operational tests, in November, 2003. Thus, the second analysis used the same depth-of-knowledge levels assigned to the objectives by the reviewers in July. At the first alignment analysis, the eight reviewers reached consensus on the depth-of-knowledge level for each objective under each of the five standards for each grade level prior to coding the items. The results from their deliberation are presented in Table 1. Across the grades, reviewers rated 75% to 90% of the objectives at depth-of-knowledge (DOK) levels of 1 (Recall) and 2 (Skills and Concepts). Reviewers' analysis indicated some progression across grades, finding that the latter grades had a higher percentage of objectives rated at Level 3 (Strategic Thinking). Grades 7, 8, and 10 all had more than 20% of the objectives rated at Level 3.

Table 1
Percent of Objectives by Depth-of-Knowledge (DOK) Levels for Each Grade, West Virginia Alignment Analysis for Mathematics

Grade	Number of Objs	DOK Level	# of objs by Level	% w/in std by Level
Grade 3	44	1	20	45
		2	18	40
		3	5	11
		4	1	2
Grade 4	44	1	23	52
		2	16	36
		3	4	9
		4	1	2
Grade 5	37	1	14	37
		2	20	54
		3	3	8
Grade 6	34	1	14	41
		2	18	52
		3	2	5
Grade 7	36	1	12	33
		2	16	44
		3	8	22
Grade 8	32	1	4	12
		2	20	62
		3	8	25
Grade 10	25	1	2	8
		2	17	68
		3	6	24

Using the operational test form, reviewers were more successful in the November analysis in finding an objective that corresponded to each item than in July. In the first analysis, the reviewers coded 22 assessment items as corresponding to a generic objective, a standard, because they did not feel that any of the specific objectives under the standard required that students perform what was measured by the assessment task. In November, two or more reviewers only used a generic standard for 13 assessment items (Table 2). Ten of these 13 items were assigned by two or more reviewers as corresponding to a generic objective in the first analysis. All of these items were in the first part of the test that included items from a nationally normed test that was included to provide comparison data. The use of generic standards can indicate that the objectives under a standard do not fully cover all of the content under that standard. This could be due to a number of reasons, such as the fact that students at another grade level are expected to achieve the content, or that there are omissions in the existing objectives. The analysis indicated that there is some trade-off between having to use items to provide norming data in combination with items that correspond precisely to the state standards. However, the overall impact of including norming items that did not precisely match any

objective under the standards on judging students' attainment of the standards is minimal. On any test form, less than 10% of the items were judged as corresponding to a generic objective.

Table 2
Assessment Tasks Coded by Two or More Raters as Corresponding to the Generic Objective

Grade and Test Form	Item Number	Corresponding Standard	Number of Reviewers
Grade 4	23	Number and Operations (4.1)	3
Grade 5	2*	Number and Operations (5.1)	2
	26*	Number and Operations (5.1)	5
	28	Measurement (5.4)	2
Grade 6	7*	Number and Operations (6.1)	5
	14*	Number and Operations (6.1)	4
	28*	Geometry (6.3)	5
Grade 7	24*	Measurement (7.4)	4
	12	Data Analysis and Probability (7.5)	5
	13*	Data Analysis and Probability (7.5)	3
Grade 10	4*	Algebra (10.2)	8
	11*	Measurement (10.4)	6
	13*	Measurement (10.4)	2

* Same item assigned a generic objective in the July analysis.

Alignment of Curriculum Standards and Assessments

Each form of the assessment for grades 3 through 8 had 52 items, 48 multiple-choice items and four open-response items. The grade 10 assessment had 49 items, 45 multiple-choice items and four open-response items. Each open-response item was worth three points. The total points for each assessment for grades 3 through 8 was 60 points and for grade 10 was 57 points. The computations of the comparison of the assessment and curriculum standards in the alignment analysis considered all of the items as weighed equally. The results of the analysis for each of the four criteria are summarized in Table 3. More detailed data on each of the criteria are given in the appendix in the first three tables for each of the grade levels. In Table 3, “YES” indicates that an acceptable level was attained between the assessment and the standard 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. A further analysis took into consideration the additional point value (3) given to each of the four open-response items. This analysis took into consideration the DOK level of the item as compared to the DOK level of the corresponding objective and the objective used in judging the attainment of the Depth-of-Knowledge Consistency

criterion. Each open-response item was considered the equivalent of three multiple-choice items. This changed the results some for most of the grades. When consideration of the weighting of the items satisfied the acceptable level, the shading of the appropriate cell in Table 3 was removed. For example, for grade 4, one of the four open-response items (item 50) corresponded to objective 5.4 under the Data Analysis and Probability standard and had the same DOK level as the objective (Level 2). Weighting this item by 3 points sufficiently increased the percentage of items/points of this item with a DOK level at or above the DOK level of the corresponding objective for the standard, so that at least 50% of the items had a DOK level at or above the DOK level of the corresponding objective. When the shading was removed, however, I retained “NO” in the cell to indicate what the value would have been had all of the items been weighted equally.

Table 3
Summary of Acceptable Levels on Four Alignment Criteria Met by Assessments and Standards for Mathematics

Standard	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
Grade 3				
3.1 - Num/Oper	YES	YES	YES	YES
3.2 – Algebra	YES	YES	YES	YES
3.3 - Geometry	YES	YES	YES	YES
3.4 – Measurement	YES	WEAK	YES	YES
3.5 – Data Analy/Prob	YES	NO	YES	YES
Grade 4				
4.1 - Num/Oper	YES	YES	YES	YES
4.2 – Algebra	YES	YES	YES	YES
4.3 - Geometry	YES	YES	YES	YES
4.4 - Measurement	YES	YES	YES	YES
4.5 - Data Analy/Prob	YES	NO	YES	YES
Grade 5				
5.1 - Num/Oper	YES	YES	YES	YES
5.2 - Algebra	YES	YES	YES	YES
5.3 - Geometry	YES	YES	YES	YES
5.4 - Measurement	YES	YES	YES	YES
5.5 - Data Analy/Prob	YES	NO	YES	YES

Table 3 (continued)

Summary of Acceptable Levels on Four Alignment Criteria Met by Assessments and Standards for Mathematics

Standard	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
Grade 6				
6.1 - Num/Oper	YES	YES	YES	WEAK
6.2 - Algebra	YES	YES	YES	YES
6.3 - Geometry	YES	YES	YES	YES
6.4 - Measurement	YES	WEAK	YES	YES
6.5 - Data Analy/Prob	YES	NO	YES	YES
Grade 7				
7.1 - Num/Oper	YES	NO	YES	YES
7.2 - Algebra	YES	YES	YES	YES
7.3 - Geometry	YES	YES	YES	YES
7.4 - Measurement	YES	YES	YES	YES
7.5 - Data Analy/Prob	YES	NO	YES	YES
Grade 8				
8.1 - Num/Oper	YES	WEAK	YES	YES
8.2 - Algebra	YES	YES	YES	YES
8.3 - Geometry	YES	YES	YES	YES
8.4 - Measurement	YES	WEAK	YES	WEAK
8.5 - Data Analy/Prob	YES	NO	YES	YES
Grade 10				
10.1 - Num/Oper	YES	NO	YES	NO
10.2 - Algebra	YES	WEAK	YES	YES
10.3 - Geometry	YES	YES	YES	YES
10.4 - Measurement	YES	NO	YES	YES
10.5 - Data Analy/Prob	YES	NO	YES	YES

In mathematics, the alignment between assessments and standards in the analysis using the operational tests clearly improved over the first analysis conducted with field-test forms. For all grades, each form had a sufficient number of assessment items that corresponded to each standard to satisfy the Categorical Concurrence criterion. For each grade, these items were adequately distributed among the objectives under each standard to satisfy the Range-of-Knowledge Correspondence criterion. In general, the items did not overemphasize one or two objectives compared to the other objectives. However, for three standards (6.1, 8.4, and 10.1), one of the possible objectives overemphasized compared to the other objectives under the standard with corresponding items. What still prevented the assessments and the standards from being fully aligned was that too few of the assessment items had a DOK level that was at or above the DOK level of the corresponding objective to meet the Depth-of-Knowledge Consistency criterion primarily for the Data Analysis and Probability standards. The magnitude of the problem was due only to two to four items at each grade level, less than 10% of the items. Thus, the alignment in mathematics between the assessments and the standards for all seven grades is reasonable. For grades 4 and 6, there is sufficient agreement on all four alignment criteria for the assessments and standards to be considered fully aligned.

Changes needed to improve the alignment at each grade level are discussed in greater detail in the following sections.

Grade 3 Mathematics

Changes needed for improving alignment at grade 3:

A total of three assessment items need to be replaced by items with a higher DOK level that is the same as the DOK level of the corresponding objective. One of these items should be an item that corresponds to Standard 3.4, Measurement, and two of these items should correspond to Standard 3.5, Data Analysis and Probability.

Grade 4 Mathematics

No changes are needed for improving alignment at grade 4.

Grade 5 Mathematics

Changes needed for improving alignment at grade 5:

One assessment item that now corresponds to an objective under Standard 5.5.5 needs to be replaced by an item with a DOK level that is at least the same DOK level of as the matching objective.

Grade 6 Mathematics

Changes needed for improving alignment at grade 6:

No changes are really required. Currently, objective 6.1.6 is overemphasized compared to other objectives under Standard 6.1, Number and Operations. Six or seven items correspond to this objective compared to only one or two items that correspond to other objectives under Standard 6.1. The alignment could be improved by replacing up to two items that currently correspond to objective 6.1.6 with items corresponding to one of the other nine objectives.

Grade 7 Mathematics

Changes needed for improving alignment at grade 7:

A total of three assessment items need to be replaced by items with a higher DOK level—i.e., the same as the DOK level of the corresponding objective. Two of these items should be items that correspond to Standard 7.1, Number and Operations, and one of these items should be an item that corresponds to Standard 7.5, Data Analysis and Probability.

Grade 8 Mathematics

Changes needed for improving alignment at grade 8:

Three assessment items need to be replaced by items with a higher DOK level that is the same as the DOK level of the corresponding objective. One of these items should be of those that correspond to Standard 8.1, Number and Operations, and two of these items should be of those that correspond to Standard 8.5, Data Analysis and Probability. In addition, one or two of the items that now correspond to objective 8.4.1 under Standard 8.4, Measurement, should be replaced by items that correspond to one of the other three objectives under this standard. Currently, objective 8.4.1 is overemphasized, with five corresponding objectives—whereas the other three objectives each have only one corresponding assessment item. This imbalance results in the Balance-of-Representation criterion being only weakly met.

Grade 10 Mathematics

Changes needed for improving alignment at grade 10:

The greatest changes for all grades are needed at grade 10; however, even for grade 10 only modest changes are needed. Four assessment items need to be replaced by items with a higher DOK level, a DOK level the same as that of the corresponding objective. Three of these items should be items that correspond to Standard 10.1, Number and Operations. Currently, seven items match objective 10.1.1, whereas, one to three items match other objectives under Standard 10.1. The alignment would be improved by replacing three of the items that currently match objective 10.1.1 with items that correspond to other objectives under Standard 10.1 and with a DOK level that is at least the same as the DOK level of the matching objective. In addition, one item that currently corresponds to an objective under Standard 10.5, Data Analysis and Probability, should

be replaced by an item with a DOK level that is at least the same as that of the corresponding objective.

Source of Challenge

Reviewers were asked to indicate whether there was a source of challenge issue on any of the items. The concerns expressed by the reviewers are given in the fifth table for each grade (Table __.5) in the Appendix. Those items noted by more than one reviewer should be given greater consideration for improvement or elimination. However, it is possible that one reviewer observed a valid concern missed by the other reviewers. It is also possible that the teaching of mathematics in West Virginia addresses the concerns of the reviewers. Reviewers' greatest concerns were with regards to format, or to assumptions that had to be made. More than one reviewer indicated a source of challenge for four items—grade 6, item 52; grade 7, item 9; grade 8, item 21, and grade 10, item 34. Reviewers were concerned that item 52 (grade 6) and item 21 (grade 8) did not make clear enough that the figure was a rectangular prism with square angles. Reviewers felt the situation depicted in item 9 (grade 7) should not be represented by a line graph. Two reviewers felt that one sentence ending with angle 1 and a period, with the next sentence beginning with $4x + 3$, could be confusing. It read “angle 1. $4x + 3$. . .”

Notes

Some reviewers made other comments about the items, which they recorded as notes. These notes are presented in the seventh table for each grade (Tables __.7) in the Appendix. The notes of some reviewers correspond to the source of challenge noted by other reviewers. The authors of these notes and of the source-of-challenge notation thus sometimes added to the number of reviewers who had a concern about a specific item. Reviewers' notes sometimes clarify the match between the item and the objective as being weak. The notes also indicate issues that a reviewer might have found with an item and his/her suggestion regarding how the item could be improved.

General Comments Made by Reviewers

After coding the assessment items for each grade level, the reviewers were asked four questions about their opinion of the general alignment between the standards and the assessments:

- 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?
- 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?
- C. Was there any content you expected to be assessed, but found no items assessing that content? What was that content?

- D. What is your general opinion of the alignment between the standards and assessment:
- i. perfect alignment
 - ii. acceptable alignment
 - iii. needs slight improvement
 - iv. needs major improvement
 - v. not aligned in any way.

These responses indicate the reflections of reviewers at the time of coding. These reflections compliment and inform the more rigorous analysis, but should not be interpreted as definitive, only impressionistic. The responses by the mathematics reviewers are presented below:

Grade 3 Debriefing

- A. Mathematics Content
- Not enough emphasis on fractions
 - No volume and area items
 - No estimation
- B. Distribution of DOK levels
- OK
- C. Mathematics Performance
- Not enough emphasis on fractions
 - No volume and area items
 - No estimation
- D. Overall Alignment
- Assessment items match well
 - Some standards not covered by items

Grade 4 Debriefing

- A. Mathematics Content
- No statistics—means, median, mode
 - No mixed numbers
 - No fractions to decimals
 - Patterns were covered—no Nth term
 - No area
 - No conversions
 - Lot of time Too many time items
 - 5.3 covered but pictograph not in objectives
 - N

- B. Distribution of DOK levels
 - Lots of 1 & 2 items
- C. Mathematics Performance
 - No statistics—means, median, mode
 - No mixed numbers
 - No fractions to decimals
 - Patterns were covered—no Nth term
 - No area
 - No conversions
 - Lot of time. Too many time items
 - 5.3 covered, but pictograph not in objective.
 - N
- D. Overall Alignment
 - Covered more objectives than grade 3
 - Match to standard easy—match to specific objectives hard

Grade 5 Debriefing

- A. Mathematics Content
 - No stem and leaf
 - No similar figures
 - No ordering decimals, fractions
 - No volume
 - No mass
- B. Distribution of DOK levels
 - Good mix of Levels 1-2-3
- C. Mathematics Performance
 - No stem and leaf
 - No similar figures
 - No ordering decimals, fractions
 - No volume
 - No mass
- D. Overall Alignment
 - Pretty good, acceptable

Grade 6 Debriefing

- A. Mathematics Content
 - Only one mode items

- One of the items does not match objective very well (i.e., constant scale)
 - No estimation—primes
 - No converting between fractions and decimals and percent
 - Only one percent problem (50%)
 - No integers
 - No scientific notation
- B. Distribution of DOK levels
- Lower than previous (more Level 1)
- C. Mathematics Performance
- See comments for A (above)
- D. Overall Alignment
- Match at the lower level

Grade 7 Debriefing

- A. Mathematics Content
- No comparing of integers (7.1.1)
 - No slope of line
 - No lines in coordinate plane
 - Weak in geometry
 - No Pythagorean Theorem
- B. Distribution of DOK levels
- Good spread among Levels 1-2-3
- C. Mathematics Performance
- No comparing of integers (7.1.1)
 - No slope of line
 - No lines in coordinating plane
 - Weak in geometry
 - No Pythagorean Theorem
- D. Overall Alignment
- Weak in geometry

Grade 8 Debriefing

- A. Mathematics Content
- No irrationals
 - No properties of numbers
 - No parallel lines cut by transversal

- Problem solving hard to distinguish (8.1.6 & 8.2.10)
 - Only 1 Pythagorean Theorem
- B. Distribution of DOK levels
- DOK well covered
- C. Mathematics Performance
- No irrationals
 - No properties of numbers
 - No parallel lines cut by transversal
 - Problem solving hard to distinguish (8.1.6 & 8.2.10)
 - Only 1 Pythagorean Theorem
- D. Overall Alignment
- Items map to standard more clearly than previous tests

Grade 10 Debriefing

- A. Mathematics Content
- Not many 4-step problems to solve (10.2.3)
 - Not just using measurement tools
 - No factoring
 - Lot of computation (10.1.1)
 - Link graph with several questions
- B. Distribution of DOK levels
- Average depth-of-knowledge (only 13)
- C. Mathematics Performance
- Not many 4-step problems to solve (10.2.3)
 - Not just using measurement tools
 - No factoring
 - Lot of computation (10.1.1)
 - Link graph with several questions
- D. Overall Alignment
- Not as close a match to objectives
 - Had to stretch some objectives

It should be noted that in this analysis, one of four forms of the operational test at each grade level was used. The topics noted by the reviewers as missing could be measured on another form and should not be interpreted as an omission. However, the reviewers' comments do provide some indication as to what topics should be checked for on the other forms at the grade level.

Distribution of Hits by Standard

Table 4 reports the distribution of hits by standard for each grade. The percentages correspond very closely to the percentage of items for each standard but not exactly. For this analysis, all items were weighted equally without giving any consideration to whether or not an item was an open-response item. Reviewers did assign multiple objectives to some items, which would also result in variation in the percentages if items are only associated with one objective.

Table 4
Percent of Hits by Standard for Each Grade

	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 10
3.1 - Num/Oper	42	40	37	26	23	18	18
3.2 – Algebra	13	15	16	26	26	30	34
3.3 – Geometry	18	19	17	19	15	18	19
3.4 – Measurement	16	13	16	14	16	14	16
3.5 – Data Analysis/Prob	11	13	14	15	20	20	13

Reliability Among Reviewers

As in the previous analysis, the intraclass correlation among the mathematics reviewers’ assignment of DOK levels to items was very high: Except for one grade (grade 7), the intraclass correlations were all above .9 (Table 5). This indicates that the average DOK level for each item is reliable. The eight mathematics reviewers were very consistent in assigning a DOK level to items. The DOK levels assigned by each reviewer for each grade are presented in Table __.6 in the Tables appended to this report.

Table 5
Intraclass Correlation Among Eight Reviewers in Assigning Item Depth-of-Knowledge Level

Grade	Intraclass Correlation
3	0.930
4	0.928
5	0.935
6	0.916
7	0.875
8	0.942
10	0.900

Summary

This analysis of the West Virginia operational tests and curriculum standards in mathematics for seven grades indicates that the alignment is reasonable and good. At each grade level, there is a sufficient number of items to judge attainment of a standard and these items are adequately distributed among the objectives to measure a range of the required knowledge under each standard. For nearly all of the standards across the seven grades, the items matching objectives are distributed fairly evenly. The depth-of-knowledge levels of a small number of items, mainly those relating to Data Analysis and Probability standards, were lower than the level of corresponding objectives. Thus, the DOK Consistency criterion was not fully met for the Data Analysis and Probability standard for five of the seven grades. The number of alignment issues was low and could be fixed by replacing at most four items on any one of the test forms. No changes are needed for grades 4 and 6. One item needs to be replaced for grade 5. Three items need to be replaced for grades 3, 7, and 8. Four items need to be replaced for grade 10. This alignment analysis was performed using one of four forms of the operational test in mathematics at each grade level. It is not expected or even desired that exactly the same content be measured on each of the forms. It is expected that each form have a sufficient number of items to measure each of the standards. The debriefing comments made by the reviewers noted that some topics that were not measured on the forms analyzed. These comments provide some guidance for reviews of the other three forms to ensure that the other forms cover such topics. The reliability among the reviewers in assigning the DOK levels to items was very high, adding to the credibility of the results. Thus, on the basis of this analysis, the conclusion is justified that the Westest in mathematics for grades 3, 4, 5, 6, 7, 8, and 10 are aligned with the West Virginia curriculum standards.

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.

Tables

Brief Explanation of Data in the Alignment Tables by Column

Tables (grade) 1

Goals #	Number of objectives plus one for a generic objective for each standard.
Objs #	Average number of objectives for reviewers. If the number is greater than the actual number in the standard, then at least one reviewer coded an item for the goal/objective, but did not find any objective in the goal that corresponded to the item.
Level	The Depth-of-Knowledge level coded by the reviewers for the objectives for each standard.
# of objs by Level	The number of objectives coded at each level
% w/in std by Level	The percent of objectives 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

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

Tables (grade).3

First five columns repeat columns from Table 1 and 2.

Range of Objectives	
# Objs Hit	Average number and standard deviation of the objectives hit coded by reviewers.
% of Total	Average percent and standard deviation of the total objectives that had at least one item coded.
Range of Know. Accept.	<p>“Yes” indicates that 50% or more of the objectives had at least one coded objective.</p> <p>“Weak” indicates that 40% to 50% of the objectives had at least one coded objective.</p> <p>“No” indicates that 40% or less of the objectives had at least one coded objective.</p>
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.

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

Where O = Total number of objectives hit for the standard
 $I_{(k)}$ = Number of items hit corresponding to objective (k)
 H = Total number of items hit for the standard

Bal. of Rep Accept.	<p>“Yes” indicates that the Balance Index was .7 or above (items evenly distributed among objectives).</p> <p>“Weak” indicates that the Balance Index was .6 to .7 (a high percentage of items coded as corresponding to two or three objectives).</p> <p>“No” indicates that the Balance Index was .6 or less (a high percentage of items coded as corresponding to one objective.)</p>
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Tables (grade).4

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

Tables (grade).5

Comments made by reviewers on items identified as having a source of challenge issue by item number.

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).7

All notes made by reviewers on items by item number.

Tables (grade).8

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

Tables (grade).9

This list for each item all of the objectives coded by the eight reviewers as corresponding to the item. Repeat of an objective indicates the number of reviewers who coded that objective as corresponding to the item.

Tables (grade).10

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

Tables (grade).11

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

Table 3.1
Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 3 Mathematics—November 2003
Number of Assessment Items—52

Standards			Level by Objective			Hits		Cat. Concurr.
Title	Goals #	Objs #	Level	# of objs by Level	% w/in std by Level	Mean	S.D.	
3.1 - Num/Oper	16	16.12	1	11	68	24.62	3.31	YES
			2	4	25			
			3	1	6			
3.2 - Algebra	6	6	1	2	33	7.88	0.78	YES
			2	4	66			
3.3 - Geometry	8	8.12	1	5	62	10.5	0.71	YES
			2	2	25			
			3	1	12			
3.4 - Measurement	10	10	1	2	20	9.25	0.43	YES
			2	7	70			
			4	1	10			
3.5 - Data Analy/ Prob	4	4	2	1	25	6.62	0.48	YES
			3	3	75			
Total	44	44.25	1	20	45	58.88	3.62	
			2	18	40			
			3	5	11			
			4	1	2			

Table 3.2

*Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 3 Mathematics—November 2003
Number of Assessment Items—52*

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.	
3.1 - Num/Oper	16	16.12	24.62	3.31	16	34	52	41	31	40	YES
3.2 - Algebra	6	6	7.88	0.78	19	33	52	43	29	43	YES
3.3 - Geometry	8	8.12	10.5	0.71	20	40	65	42	15	27	YES
3.4 - Measurement	10	10	9.25	0.43	53	48	35	45	12	32	WEAK
3.5 – Data Analy/Prob	4	4	6.62	0.48	72	34	28	34	0	0	NO
Total	44	44.25	58.88	3.62	29	42	49	43	21	36	

Table 3.3

Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 3 Mathematics—November 2003
Number of Assessment Items—52

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.	
3.1 - Num/Oper	16	16.12	24.62	3.31	10.12	1.05	63	6	YES	42	3	0.70	0.06	YES
3.2 – Algebra	6	6	7.88	0.78	4.88	0.60	81	10	YES	13	1	0.81	0.02	YES
3.3 – Geometry	8	8.12	10.5	0.71	5.5	0.71	68	9	YES	18	1	0.87	0.04	YES
3.4 - Measurement	10	10	9.25	0.43	5.25	0.66	52	7	YES	16	1	0.74	0.02	YES
3.5 - Data Analy/Prob	4	4	6.62	0.48	2.62	0.48	66	12	YES	11	1	0.77	0.09	YES
Total	44	44.25	58.88	3.62	5.68	2.55	66	13		20	11	0.78	0.08	

Table 3.4

Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria

Eight Reviewers

West Virginia Grade 3 Mathematics—November 2003

Number of Assessment Items—52

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
3.1 - Num/Oper	YES	YES	YES	YES
3.2 - Algebra	YES	YES	YES	YES
3.3 - Geometry	YES	YES	YES	YES
3.4 - Measurement	YES	WEAK	YES	YES
3.5 - Data Analy/Prob	YES	NO	YES	YES

Table 3.5
Source-of-Challenge Issues by Reviewer
West Virginia Grade 3 Mathematics—November 2003

Item Number	Comments by Reviewer
18	Primary objective: "reasoning"--logic problem.
23	Just choose smallest number
42	Who added the initial 75cents?
49	Don't have ticket=5 tickets

Table 3.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 3 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1
7	1	1	2	1	1	2	1	2
8	1	2	1	2	2	1	1	1
9	2	2	2	2	2	2	2	2
10	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1
12	1	2	2	1	2	2	1	1
13	1	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1	1
15	2	2	2	2	2	2	2	2
16	1	2	2	2	2	2	1	2
17	2	1	2	2	2	2	2	1
18	3	3	3	3	2	3	3	3
19	1	1	2	1	2	1	1	1
20	1	1	1	1	1	1	1	1
21	1	2	2	1	1	2	1	1

Table 3.6 (Continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 3 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
22	1	1	1	1	1	1	1	1
23	2	1	2	2	2	1	2	2
24	2	2	2	2	1	1	1	2
25	1	1	1	1	2	1	1	1
26	2	2	2	2	1	2	1	2
27	1	2	2	3	2	3	2	2
28	1	2	2	1	2	2	2	2
29	2	2	2	1	2	1	1	1
30	2	2	2	2	2	2	2	2
31	3	2	2	2	2	2	2	2
32	1	1	2	3	2	1	1	1
33	1	1	1	1	1	1	1	1
34	1	1	2	1	2	1	1	1
35	1	1	1	1	1	1	1	1
36	1	1	1	1	1	1	1	1
37	1	1	2	1	2	2	1	1
38	1	2	2	2	1	2	2	1
39	1	1	1	1	1	1	1	1
40	2	2	2	2	2	2	2	2
41	1	1	2	2	1	1	2	1

Table 3.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 3 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	2	3	3	3	2	3	2	2
43	1	1	1	1	1	1	1	1
44	1	1	1	1	1	1	1	1
45	1	1	2	2	2	2	1	1
46	1	1	1	1	1	1	1	1
47	1	1	1	2	2	1	2	1
48	1	1	1	1	1	1	1	1
49	2	1	2	2	2	2	2	2
50	2	2	2	2	2	2	2	2
51	2	2	2	2	2	2	2	1
52	2	2	3	2	3	3	1	2
Intraclass Corr Grade 3 Mathematics					0.930			

Table 3.7
Notes by Reviewer
West Virginia Grade 3 Mathematics—November 2003

Item Number	Comments by Reviewer
6	Model numbers
7	Reviewer put ? after second objective.
10	"Origami" is a source-of-challenge word. How do they know the nose & tail?
	Adds reading not needed.
12	Concept
13	Stem too wordy
14	#14-15: Items should not be next to each other.
16	Joined to what?
21	Is it really gray?
37	This is modeling not read and write.
47	This is modeling decimals.
	Can beads be heart shaped?
48	Reviewer put? After primary obj.

Table 3.8
DOK Levels and Objectives Coded by Each Reviewer
Grade 3 Mathematics—November 2003
West Virginia

Item	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj
1	1	3.1.13		1	3.1.13	1	3.1.3		1	3.1.13		1	3.1.13		1	3.1.13		1	3.1.13		1	3.1.13	
2	1	3.1.13		1	3.1.15	1	3.1.13		1	3.1.13		1	3.1.13		1	3.1.15		1	3.1.13		1	3.1.15	
3	1	3.1.10		1	3.1.10	1	3.1.10		1	3.1.16		1	3.4.1		1	3.1.10		1	3.1.10		1	3.1.10	
4	1	3.1.10		1	3.1.10	1	3.1.10		1	3.1.10		1	3.1.10		1	3.1.10		1	3.1.10		1	3.1.10	
5	1	3.3.2		1	3.3.2	1	3.3.2		1	3.3.2		1	3.3.1		1	3.3.2		1	3.3.2		1	3.3.2	
6	1	3.1.3		1	3.1	1	3.1.3		1	3.1.3		1	3.1.3		1	3.1.3		1	3.1.3		1	3.1.3	
7	1	3.1.10	3.2.6	1	3.2.6	2	3.1.10	3.2.6	1	3.2.6		1	3.2.6		2	3.1.10	3.2.6	1	3.2.6	3.1.10	2	3.1.10	3.2.6
8	1	3.5.4		2	3.5.4	1	3.5.4		2	3.5.4		2	3.5.4		1	3.5.4		1	3.5.4		1	3.5.4	
9	2	3.5.4	3.1.10	2	3.5.4	2	3.5.4		2	3.5.4		2	3.5.4		2	3.5.4	3.1.10	2	3.5.4		2	3.5.4	
10	1	3.4.1		1	3.4.1	1	3.4.1		1	3.4.1		1	3.4.1		1	3.4.1		1	3.4.1		1	3.4.1	
11	1	3.3.4		1	3.3.4	1	3.3.4		1	3.3.4		1	3.3.4		1	3.3.4		1	3.3.4		1	3.3.4	
12	1	3.1.12		2	3.1.12	2	3.1.12		1	3.1.12		2	3.1.12		2	3.1.12	3.1.16	1	3.1.11		1	3.1.15	
13	1	3.3.2		1	3.3.2	1	3.3.2		1	3.3.2		1	3.3.2		1	3.3.2		1	3.3.2		1	3.3.2	
14	1	3.1.12		1	3.1.12	1	3.1.12		1	3.1.12		1	3.1.12	3.2.6	1	3.1.12	3.2.6	1	3.1.12	3.2.6	1	3.1.12	
15	2	3.2.3		2	3.2.3	2	3.2.3		2	3.2.3		2	3.2.3		2	3.2.3		2	3.2.3		2	3.2.3	
16	1	3.3.1		2	3.3.1	2	3.3.1		2	3.3.1		2	3.3.1		2	3.3.1		1	3.3.1		2	3.3.1	
17	2	3.1.10	3.1.16	1	3.1.10	2	3.1.10		2	3.1.10		2	3.1.10		2	3.1.10		2	3.1.16		1	3.1.10	
18	3	3.1.16	3.5.4	3	3.5.1/3.5.4	3	3.5.1	3.5.4	3	3.5.4		2	3.5.4		3	3.5.4	3.1.16	3	3.5.1	3.5.4	3	3.5.4	3.5.1
19	1	3.1.12		1	3.1.12	2	3.2.5	3.1.12	1	3.2.5	3.1.12	2	3.1.12	3.2.5	1	3.1.12	3.2.5	1	3.1.12		1	3.1.12	3.2.5
20	1	3.1.5		1	3.1.5	1	3.1.5		1	3.1.5		1	3.1.5		1	3.1.5		1	3.1.5		1	3.1.5	
21	1	3.5.3		2	3.5.3	2	3.1.8	3.5.3	1	3.5.3		1	3.5.3		2	3.1.8	3.5.3	1	3.5.3		1	3.5.3	3.1.8
22	1	3.1.3		1	3.1.3	1	3.1.3		1	3.1.3		1	3.1.3		1	3.1.10		1	3.1.3		1	3.1.3	
23	2	3.1.2		1	3.1.1	2	3.1.1		2	3.1.1		2	3.1.1		1	3.1.1		2	3.1.1		2	3.1.1	
24	2	3.4.6		2	3.4.7	2	3.4.6		2	3.4.7		1	3.4.7		1	3.4.7		1	3.4.7		2	3.4.7	

Table 3.8 (continued)

Item	DO K	PObj	S1Obj	D O K	PObj	DO K	PObj	S1Obj	DO K	PObj	S1Obj	DO K	PObj	S1Obj	D O K	PObj	S1Obj	DO K	PObj	S1Obj	DO K	PObj	S1Obj
25	1	3.4.1		1	3.4.1	1	3.4.1		1	3.4.1		2	3.4.1		1	3.4.1		1	3.4.1		1	3.4.1	
26	2	3.4.7		2	3.4.7	2	3.4.7		2	3.4.7		1	3.4.7		2	3.4.7		1	3.4.7		2	3.4.7	
27	1	3.5.3		2	3.5.3	2	3.5.3		3	3.5.4		2	3.5.4		3	3.5.3		2	3.5.3		2	3.5.3	
28	1	3.2.4		2	3.2.4	2	3.2.4		1	3.2.4		2	3.2.4		2	3.2.4		2	3.2.4		2	3.2.1	
29	2	3.2.1		2	3.2.1	2	3.2.1		1	3.2.1		2	3.2.1		1	3.2.1		1	3.2.1		1	3.2.1	
30	2	3.2.1		2	3.2.1	2	3.2.1		2	3.2.1		2	3.2.1		2	3.2.1		2	3.2.1		2	3.2.1	
31	3	3.1.16		2	3.1	2	3.1.16		2	3.1.13		2	3.2.1		2	3.1.15		2	3.1.13		2	3.1.15	
32	1	3.1.10		1	3.1.10	2	3.1.16		3	3.1.16		2	3.1.16		1	3.1.10		1	3.1.10		1	3.1.10	
33	1	3.3.4		1	3.3.4	1	3.3.4		1	3.3.4		1	3.3.4		1	3.3.4		1	3.3.4		1	3.3.4	
34	1	3.1.14		1	3.1.14	2	3.1.14		1	3.1.14		2	3.1.14		1	3.1.14		1	3.1.11		1	3.1.14	
35	1	3.1.10		1	3.1.10	1	3.1.16		1	3.1.16		1	3.1.10		1	3.1.10	3.1.16	1	3.1.10		1	3.1.10	
36	1	3.3.8		1	3.3.8	1	3.3.8		1	3.3.8		1	3.3.8		1	3.3.8		1	3.3.8		1	3.3.3	
37	1	3.4.8		1	3.1.10/ 3.4.8	2	3.4.8		1	3.4.8		2	3.4.8		2	3.4.8	3.1.10	1	3.4.8	3.1.10	1	3.4.8	3.1.10
38	1	3.2.4		2	3.2.4	2	3.2.4		2	3.5.1	3.2.4	1	3.2.4		2	3.2.4		2	3.2.2		1	3.2.2	
39	1	3.3.1		1	3.3.1	1	3.3.1		1	3.3.1		1	3.3.1		1	3.3.1		1	3.3.1		1	3.3.1	
40	2	3.4.7		2	3.4.7	2	3.4.7		2	3.4.7		2	3.4.7		2	3.4.7		2	3.4.7		2	3.4.7	
41	1	3.4.4		1	3.4.4	2	3.4.4		2	3.4.4		1	3.4.4		1	3.4.1		2	3.4.4		1	3.4.4	
42	2	3.2.4	3.1.10	3	3.2.4/ 3.1.10	3	3.1.6		3	3.2.4	3.1.10/ 3.1.16	2	3.1.10		3	3.2.4	3.1.10/ 3.1.16	2	3.2.4		2	3.1.10	3.2.4
43	1	3.4.10		1	3.4.10	1	3.4.10		1	3.4.10		1	3.4.10		1	3.4.10		1	3.4.10		1	3.4.10	
44	1	3.4.1		1	3.4.1	1	3.4.1		1	3.4.1		1	3.4.1		1	3.4.1		1	3.4.1		1	3.4.1	
45	1	3.3.2		1	3.3.2	2	3.3.2		2	3.3.2		2	3.3.2		2	3.3.2		1	3.3.2		1	3.3.2	
46	1	3.3.8		1	3.3.8	1	3.3.8		1	3.3.8		1	3.3.8		1	3.3.8		1	3.3.8		1	3.3.8	
47	1	3.1.2		1	3.1.2	1	3.1.2		2	3.1.2		2	3.1.5		1	3.1.2		2	3.1.2		1	3.1.5	
48	1	3.3.5		1	3.3.5	1	3.3.5		1	3.3.5		1	3.3.5		1	3.3.5		1	3.3.5		1	3.3.5	
49	2	3.5.4		1	3.5.4	2	3.5.4		2	3.5.4		2	3.5.4		2	3.5.4	3.1.1	2	3.5.4		2	3.5.1	
50	2	3.1.10	3.1.16	2	3.1.10/3. 1.14	2	3.1.10	3.1.16	2	3.1.10	3.1.16	2	3.1.10	3.1.16	2	3.1.10	3.1.16	2	3.1.10	3.1.16	2	3.1.10	3.1.16
51	2	3.1.12		2	3.1.12	2	3.1.12		2	3.1.14		2	3.1.16		2	3.1.14	3.1.16/ 3.1.12	2	3.1.15	3.1.16	1	3.1.12	
52	2	3.1.15		2	3.4.3/3.3	3	3.1.5	3.1.9	2	3.3.1	3.1.5	3	3.1.15		3	3.3.3	3.3.7	1	3.1.5		2	3.1.5	

Table 3.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 3 Mathematics--November 2003

	Low		Medium		High									
	8		9.057693		16									
1:	3.1.3	3.1.13	3.1.13	3.1.13	3.1.13	3.1.13	3.1.13	3.1.13						
2:	3.1.13	3.1.13	3.1.13	3.1.13	3.1.13	3.1.15	3.1.15	3.1.15						
3:	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.16	3.4.1						
4:	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10						
5:	3.3.1	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2						
6:	3.1	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3						
7:	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.2.6	3.2.6	3.2.6	3.2.6	3.2.6	3.2.6	3.2.6	3.2.6	
8:	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4						
9:	3.1.10	3.1.10	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4				
10:	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1						
11:	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4						
12:	3.1.11	3.1.12	3.1.12	3.1.12	3.1.12	3.1.12	3.1.12	3.1.15	3.1.16					
13:	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2						
14:	3.1.12	3.1.12	3.1.12	3.1.12	3.1.12	3.1.12	3.1.12	3.1.12	3.2.6	3.2.6	3.2.6			
15:	3.2.3	3.2.3	3.2.3	3.2.3	3.2.3	3.2.3	3.2.3	3.2.3						
16:	3.3.1	3.3.1	3.3.1	3.3.1	3.3.1	3.3.1	3.3.1	3.3.1						
17:	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.16	3.1.16					
18:	3.1.16	3.1.16	3.5.1	3.5.1	3.5.1	3.5.1	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4
19:	3.1.12	3.1.12	3.1.12	3.1.12	3.1.12	3.1.12	3.1.12	3.1.12	3.2.5	3.2.5	3.2.5	3.2.5	3.2.5	
20:	3.1.5	3.1.5	3.1.5	3.1.5	3.1.5	3.1.5	3.1.5	3.1.5						

Table 3.9 (continued)
Objectives Coded to Each Item by Reviewers
West Virginia Grade 3 Mathematics--November 2003

21:	3.1.8	3.1.8	3.1.8	3.5.3	3.5.3	3.5.3	3.5.3	3.5.3	3.5.3	3.5.3	3.5.3	3.5.3			
22:	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.10						
23:	3.1.1	3.1.1	3.1.1	3.1.1	3.1.1	3.1.1	3.1.1	3.1.1	3.1.2						
24:	3.4.6	3.4.6	3.4.7	3.4.7	3.4.7	3.4.7	3.4.7	3.4.7							
25:	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1							
26:	3.4.7	3.4.7	3.4.7	3.4.7	3.4.7	3.4.7	3.4.7	3.4.7							
27:	3.5.3	3.5.3	3.5.3	3.5.3	3.5.3	3.5.3	3.5.4	3.5.4							
28:	3.2.1	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4							
29:	3.2.1	3.2.1	3.2.1	3.2.1	3.2.1	3.2.1	3.2.1	3.2.1							
30:	3.2.1	3.2.1	3.2.1	3.2.1	3.2.1	3.2.1	3.2.1	3.2.1							
31:	3.1	3.1.13	3.1.13	3.1.15	3.1.15	3.1.16	3.1.16	3.2.1							
32:	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.16	3.1.16	3.1.16							
33:	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4							
34:	3.1.11	3.1.14	3.1.14	3.1.14	3.1.14	3.1.14	3.1.14	3.1.14							
35:	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.16	3.1.16	3.1.16						
36:	3.3.3	3.3.8	3.3.8	3.3.8	3.3.8	3.3.8	3.3.8	3.3.8							
37:	3.1.10	3.1.10	3.1.10	3.1.10	3.4.8	3.4.8	3.4.8	3.4.8	3.4.8	3.4.8	3.4.8	3.4.8			
38:	3.2.2	3.2.2	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.5.1						
39:	3.3.1	3.3.1	3.3.1	3.3.1	3.3.1	3.3.1	3.3.1	3.3.1							
40:	3.4.7	3.4.7	3.4.7	3.4.7	3.4.7	3.4.7	3.4.7	3.4.7							
41:	3.4.1	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4							
42:	3.1.6	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.16	3.1.16	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4
43:	3.4.10	3.4.10	3.4.10	3.4.10	3.4.10	3.4.10	3.4.10	3.4.10							

Table 3.9 (continued)
Objectives Coded to Each Item by Reviewers
West Virginia Grade 3 Mathematics--November 2003

44:	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1								
45:	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2								
46:	3.3.8	3.3.8	3.3.8	3.3.8	3.3.8	3.3.8	3.3.8	3.3.8								
47:	3.1.2	3.1.2	3.1.2	3.1.2	3.1.2	3.1.2	3.1.5	3.1.5								
48:	3.3.5	3.3.5	3.3.5	3.3.5	3.3.5	3.3.5	3.3.5	3.3.5								
49:	3.1.1	3.5.1	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4	3.5.4							
50:	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.10	3.1.16	3.1.16	3.1.16	3.1.16	3.1.16	3.1.16	3.1.16	3.1.16
51:	3.1.12	3.1.12	3.1.12	3.1.12	3.1.12	3.1.14	3.1.14	3.1.15	3.1.16	3.1.16	3.1.16					
52:	3.1.5	3.1.5	3.1.5	3.1.5	3.1.9	3.1.15	3.1.15	3.3	3.3.1	3.3.3	3.3.7	3.4.3				

Table 3.10

Items Coded by Reviewers to Each Objective

West Virginia Grade 3 Mathematics--November 2003

Low		Medium		High
0		9.42		58

root:															
3.1:	6	31													
3.1.1:	23	23	23	23	23	23	23	23	49						
3.1.2:	23	47	47	47	47	47	47								
3.1.3:	1	6	6	6	6	6	6	6	22	22	22	22	22	22	22
3.1.4:															
3.1.5:	20	20	20	20	20	20	20	20	47	47	52	52	52	52	
3.1.6:	42														
3.1.7:															
3.1.8:	21	21	21												
3.1.9:	52														
3.1.10:	3	3	3	3	3	3	4	4	4	4	4	4	4	4	7
	7	7	7	7	9	9	17	17	17	17	17	17	17	22	32
	32	32	32	32	35	35	35	35	35	35	37	37	37	37	42
	42	42	42	42	42	50	50	50	50	50	50	50	50		
3.1.11:	12	34													
3.1.12:	12	12	12	12	12	12	14	14	14	14	14	14	14	14	19
	19	19	19	19	19	19	19	51	51	51	51	51			
3.1.13:	1	1	1	1	1	1	1	2	2	2	2	2	31	31	
3.1.14:	34	34	34	34	34	34	34	51	51						

Table 3.11 (continued)

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 3 Mathematics--November 2003

3.4.5:					
3.4.6:	24:2				
3.4.7:	24:6	26:8	40:8		
3.4.8:	37:8				
3.4.9:					
3.4.10:	43:8				
3.5:					
3.5.1:	18:4	38:1	49:1		
3.5.2:					
3.5.3:	21:8	27:6			
3.5.4:	8:8	9:8	18:8	27:2	49:7

Table 4.1

Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers

West Virginia Grade 4 Mathematics—November 2003

Number of Assessment Items—52

Standards			Level by Objective			Hits		Cat. Concurr.
Title	Goals #	Objs #	Level	# of objs by Level	% w/in std by Level	Mean	S.D.	
4.1 - Num/Oper	18	18.38	1	12	66	21.62	2.91	YES
			2	5	27			
			3	1	5			
4.2 - Algebra	5	5	1	1	20	8	0.5	YES
			2	3	60			
			3	1	20			
4.3 - Geometry	8	8.12	1	5	62	10.25	0.43	YES
			2	3	37			
4.4 - Measurement	8	8.12	1	4	50	7.25	0.83	YES
			2	3	37			
			4	1	12			
4.5 - Data Analy/Prob	5	5	1	1	20	7.25	0.83	YES
			2	2	40			
			3	2	40			
Total	44	44.62	1	23	52	54.38	3.50	
			2	16	36			
			3	4	9			
			4	1	2			

Table 4.2

*Depth-of-Knowledge Consistency Between Standards as Assessment as Rated by Eight Reviewers
West Virginia Grade 4 Mathematics—November 2003
Number of Assessment Items—52*

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.	
4.1 - Num/Oper	18	18.38	21.62	2.91	17	37	73	41	10	25	YES
4.2 - Algebra	5	5	8	0.5	37	43	51	44	12	31	YES
4.3 - Geometry	8	8.12	10.25	0.43	20	39	75	41	5	19	YES
4.4 - Measurement	8	8.12	7.25	0.83	26	42	68	43	6	20	YES
4.5 - Data Analy/Prob	5	5	7.25	0.83	64	43	36	43	0	0	NO
Total	44	44.62	54.38	3.50	26	42	67	43	8	23	

Table 4.3

*Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment
as Rated by Eight Reviewers
West Virginia Grade 4 Mathematics—November 2003
Number of Assessment Items—52*

Standards			Hits		Range of Objectives				Range 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.	
4.1 - Num/Oper	18	18.38	21.62	2.91	14.25	1.20	78	6	YES	40	3	0.80	0.03	YES
4.2 - Algebra	5	5	8	0.5	3.75	0.66	75	13	YES	15	1	0.76	0.07	YES
4.3 - Geometry	8	8.12	10.25	0.43	8	0	99	4	YES	19	1	0.81	0.03	YES
4.4 - Measurement	8	8.12	7.25	0.83	5.88	0.33	72	5	YES	13	2	0.87	0.05	YES
4.5 – Data Analy/Prob	5	5	7.25	0.83	3.25	0.66	65	13	YES	13	1	0.73	0.06	YES
Total	44	44.62	54.38	3.50	7.02	4.05	78	15		20	10	0.79	0.07	

Table 4.4
Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers
West Virginia Grade 4 Mathematics—November 2003
Number of Assessment Items—52

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
4.1 - Num/Oper	YES	YES	YES	YES
4.2 - Algebra	YES	YES	YES	YES
4.3 - Geometry	YES	YES	YES	YES
4.4 - Measurement	YES	YES	YES	YES
4.5 – Data Analy/Prob	YES	NO	YES	YES

Table 4.5
Source-of-Challenge Issues by Reviewer
West Virginia Grade 4 Mathematics—November 2003

Item Number	Comments by Reviewer
22	Goes beyond the standard.
23	No clear match
27	Shading?
29	Needs f
32	Haley's comet came in 1986 before these children were born (discovered!)
33	"Type of" pet
35	Confusing stem
48	She can't distribute them equally!

Table 4.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 4 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1
4	1	1	1	1	1	2	1	1
5	2	2	2	2	2	2	2	2
6	1	2	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1
9	1	1	2	1	1	1	2	2
10	2	2	2	2	2	2	2	2
11	1	1	1	1	1	1	1	1
12	1	2	2	1	2	2	1	2
13	2	1	2	1	2	2	1	2
14	2	1	2	1	3	2	1	2
15	1	1	1	1	1	1	1	1
16	1	2	2	1	1	2	2	2
17	1	1	1	1	1	1	2	1
18	1	1	2	1	1	1	1	1
19	1	2	1	1	2	2	1	1
20	1	1	1	1	1	1	1	1
21	2	2	2	1	2	2	2	2

Table 4.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 4 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	3	2	2	2	2	2	2	2
43	1	1	1	1	1	1	1	1
44	1	1	1	1	1	1	1	1
45	2	1	1	1	2	2	1	1
46	1	2	2	1	1	1	1	2
47	1	2	1	1	1	1	1	1
48	2	1	2	1	1	1	2	1
49	1	2	1	1	1	1	1	1
50	2	2	2	2	2	2	2	2
51	3	3	3	2	3	3	2	3
52	2	2	3	2	2	2	2	2
Intraclass Corr Grade 4 Mathematics					0.928			

Table 4.7
Notes by Reviewer
West Virginia Grade 4 Mathematics—November 2003

Item Number	Comments by Reviewer
4	Writing number-3rd sentences not a standard.
	No clear match grade 3?
	Nuclear matter
	No right clear match
	Not good match
11	3rd grade
	Matches standard in 3 rd grade
	Analog/digital in grade 3
12	Pictographs not part of standard
13	"
14	"
18	Not a good fit

Table 4.7 (continued)

Notes by Reviewer

West Virginia Grade 4 Mathematics—November 2003

Item Number	Comments by Reviewer
21	Matches a 3rd grade objective much better
	Not clear match to objective.
22	No clear objective.
23	No modeling of fractions
	Matches a 3rd grade
29	Write 98.6 degrees
	No objective
31	No objective
32	Or 4.1.7
35	More or less?
42	Very easy because of $\frac{1}{2}$
46	Problem cannot be read
50	Source of challenge--2nd part is not separated enough. Confuses kids

Table 4.8
DOK Levels and Objectives Coded by Each Reviewer
Grade 4 Mathematics—November 2003
West Virginia

Item	DOK	Pobj	SObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj
1	1	4.1.13		1	4.1.15	1	4.1.15	1	4.1.14	1	4.1.14	1	4.1.15		1	4.1.14		1	4.1.15	
2	1	4.1.14		1	4.1.14	1	4.1.14	1	4.1.14	1	4.1.14	1	4.1.14		1	4.1.14		1	4.1.14	
3	1	4.1.15		1	4.1.13	1	4.1.13	1	4.1.13	1	4.1.15	1	4.1.15		1	4.1.13		1	4.1.13	
4	1	4.1.17		1	4.1.17	1	4.1.17	1	4.1.18	1	4.1.7	2	4.1.17		1	4.1.17		1	4.1.17	
5	2	4.1.4		2	4.1.4	2	4.1.4	2	4.1.4	2	4.1.14	2	4.1.4		2	4.1.4		2	4.1.4	
6	1	4.2.1		2	4.2.4	1	4.2.1	1	4.2.1	1	4.2.3	1	4.2.1		1	4.2.1		1	4.2.1	
7	1	4.1.6		1	4.1.6	1	4.1.6	1	4.1.6	1	4.1.7	1	4.1.6		1	4.1.6		1	4.1.7	
8	1	4.4.8		1	4.4.8	1	4.4.8	1	4.4.8	1	4.4.8	1	4.4.8	4.1.11	1	4.1.11	4.4.8	1	4.4.8	4.1.11
9	1	4.2.2		1	4.2.2	2	4.2.2	1	4.2.2	1	4.2.2	1	4.2.2		2	4.2.2		2	4.2.2	
10	2	4.2.1		2	4.2.1	2	4.2.1	2	4.2.1	2	4.2.1	2	4.2.1		2	4.2.1		2	4.2.1	
11	1	4.4.6		1	4.4.6	1	4.4.6	1	4.4.6	1	4.4.6	1	4.4.6		1	4.4.6		1	4.4.6	
12	1	4.5.3		2	4.5.3	2	4.5.3	1	4.5.3	2	4.5.3	2	4.1.1	4.5.3	1	4.5.3	4.1.1	2	4.5.3	
13	2	4.5.3		1	4.5.3	2	4.5.3	1	4.5.3	2	4.5.3	2	4.5.3	4.1.18	1	4.5.3		2	4.5.3	
14	2	4.5.3		1	4.5.3	2	4.1.3	1	4.5.3	3	4.5.3	2	4.5.3	4.1.18	1	4.5.3		2	4.5.3	
15	1	4.1.3		1	4.1.3	1	4.2.1	1	4.1.3	1	4.1.3	1	4.1.3		1	4.1.3		1	4.1.3	
16	1	4.2.1	4.5.3	2	4.2.4	2	4.3.1	1	4.2.1	1	4.2.3	2	4.2.1		2	4.2.4		2	4.2.4	
17	1	4.3.1		1	4.3.1	1	4.1.17	1	4.3.1	1	4.3.2	1	4.3.1		2	4.3.1		1	4.3.1	
18	1	4.4.8		1	4.4.8	2	4.4.7	1	4.1.11	1	4.1.11	1	4.4.8	4.1.11	1	4.1.11		1	4.4.8	
19	1	4.4.7		2	4.4.7	1	4.4.7	1	4.4.7	2	4.4.7	2	4.4.7		1	4.4.7		1	4.4.7	
20	1	4.3.4		1	4.3.4	1	4.3.4	1	4.3.4	1	4.3.4	1	4.3.4		1	4.3.4		1	4.3.4	

Table 4.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 4 Mathematics—November 2003
West Virginia

Item	DOK	PObj	SIObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	SIObj	DOK	PObj	SIObj	DOK	PObj	SIObj
21	2	4.3.3		2	4.3.3	2	4.3.3	1	4.3.2	2	4.3.3	2	4.3.3		2	4.3.3		2	4.3.3	
22	1	4.3		1	4.3.1	1	4.3.1	1	4.3.1	2	4.3.1	2	4.3.1		1	4.1.17	4.3.1	1	4.3.1	
23	1	4.1		1	4.1.5	1	4.1	1	4.1.7	1	4.1.5	1	4.1.7		1	4.1		1	4.1.7	
24	1	4.3.6		1	4.3.6	1	4.3.6	1	4.3.6	1	4.3.6	1	4.3.6		1	4.3.6		1	4.3.6	
25	2	4.4.1		2	4.4.1	2	4.4.1	2	4.4.1	2	4.4.1	2	4.4.1	4.1.6	2	4.4.1		2	4.4.1	
26	1	4.3.1		1	4.3.1	1	4.3.1	1	4.3.1	1	4.3.1	1	4.3.1		1	4.3.1		1	4.3.1	
27	2	4.5.2		2	4.5.2	1	4.5.2	1	4.1.8	2	4.5.2	2	4.5.2		2	4.1.5		1	4.5.2	
28	1	4.1.1		1	4.1.3	1	4.1.1	1	4.1.1	1	4.1.1	1	4.1.1		1	4.1.1		1	4.1.1	
29	1	4.4		1	4.4.5	1	4.4.5	1	4.4.5	1	4.4.5	1	4.4.5		1	4.4.5		1	4.1.2	
30	2	4.5.3		2	4.5.3	2	4.5.3	2	4.5.3	2	4.5.3	2	4.5.3		2	4.5.3		2	4.5.3	
31	2	4.4		2	4.4.5	2	4.4.5	1	4.4.5	2	4.4.5	2	4.4.5		1	4.5.3		2	4.4.5	
32	2	4.2.1		2	4.2.3	2	4.2.1	1	4.2.1	2	4.2.3	2	4.5.1	4.2.1	1	4.1.17		1	4.5.1	4.2.1
33	1	4.5.2		1	4.5.2	1	4.5.2	1	4.5.2	1	4.5.2	1	4.5.2		1	4.5.2		1	4.5.2	
34	1	4.2.5		2	4.2.5	2	4.2.5	1	4.2.5	1	4.2.5	2	4.2.5		1	4.2.5		1	4.2.5	
35	2	4.1.5		2	4.1.5	2	4.1.5	1	4.1.5	2	4.1.17	2	4.1.17	4.1.5	2	4.1.5	4.1.17	2	4.1.5	
36	1	4.1.11		1	4.1.11	1	4.1.11	1	4.1.11	1	4.1.11	1	4.1.11		1	4.1.11		1	4.1.11	
37	1	4.1.12		1	4.1.12	1	4.1.12	1	4.1.12	1	4.1.12	1	4.1.12		1	4.1.12		1	4.1.12	
38	1	4.2.1		2	4.2.1	2	4.2.1	1	4.2.1	2	4.2.1	2	4.2.1		2	4.2.1		1	4.2.1	
39	1	4.3.1		1	4.3.5	1	4.3.5	1	4.3.5	2	4.3.5	1	4.3.1	4.3.5	1	4.3.5		1	4.3.5	
40	1	4.1.6		1	4.1.6	2	4.1.6	1	4.1.6	1	4.1.6	2	4.1.6		1	4.1.6		1	4.1.8	

Table 4.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 4 Mathematics—November 2003
West Virginia

Item	DOK	PObj	SObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj
41	1	4.1.10		1	4.1.10	1	4.1.10	1	4.1.4	1	4.1.10	1	4.1.10		1	4.1.10		1	4.1.10	
42	3	4.1.7		2	4.1.7	2	4.1.7	2	4.1.7	2	4.1.7	2	4.1.7		2	4.1.7		2	4.1.7	
43	1	4.1.1		1	4.1.3	1	4.1.1	1	4.1.1	1	4.1.1	1	4.1.1		1	4.1.1		1	4.1.1	
44	1	4.1.16		1	4.1.16	1	4.1.16	1	4.1.16	1	4.1.16	1	4.1.16		1	4.1.16		1	4.1.16	
45	2	4.3.2		1	4.3.8	1	4.3.2	1	4.3.1	2	4.3.2	2	4.3.2		1	4.3.2		1	4.3.2	
46	1	4.1.15		2	4.3.2	2	4.1.15	1	4.1.15	1	4.1.15	1	4.1.15		1	4.1.15		2	4.1.15	
47	1	4.3.8		2	4.1.6	1	4.3.8	1	4.3.8	1	4.3.8	1	4.3.8		1	4.3.8		1	4.3.8	
48	2	4.1.6		1	4.1.15	2	4.1.6	1	4.1.6	1	4.1.6	1	4.1.6		2	4.1.6		1	4.1.6	
49	1	4.3.7		2	4.3.7	1	4.3.7	1	4.3.7	1	4.3.7	1	4.3.7		1	4.3.7		1	4.3.7	
50	2	4.5.4		2	4.5.4	2	4.5.4	2	4.5.3	2	4.5.4	2	4.5.4		2	4.5.4		2	4.5.4	
51	3	4.4.3		3	4.4.3	3	4.4.3	2	4.3.3	3	4.4.3	3	4.4.3	4.1.17	2	4.4.3		3	4.4.3	
52	2	4.2.2		2	4.2.2	3	4.2.2	2	4.2.2	2	4.2.2	2	4.2.2	4.2.3	2	4.2.2		2	4.2.2	

Table 4.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 4 Mathematics--November 2003

	Low				Medium				High		
	8				8.365385				11		
1:	4.1.13	4.1.14	4.1.14	4.1.14	4.1.15	4.1.15	4.1.15	4.1.15			
2:	4.1.14	4.1.14	4.1.14	4.1.14	4.1.14	4.1.14	4.1.14	4.1.14			
3:	4.1.13	4.1.13	4.1.13	4.1.13	4.1.13	4.1.15	4.1.15	4.1.15			
4:	4.1.7	4.1.17	4.1.17	4.1.17	4.1.17	4.1.17	4.1.17	4.1.18			
5:	4.1.4	4.1.4	4.1.4	4.1.4	4.1.4	4.1.4	4.1.4	4.1.14			
6:	4.2.1	4.2.1	4.2.1	4.2.1	4.2.1	4.2.1	4.2.3	4.2.4			
7:	4.1.6	4.1.6	4.1.6	4.1.6	4.1.6	4.1.6	4.1.7	4.1.7			
8:	4.1.11	4.1.11	4.1.11	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8
9:	4.2.2	4.2.2	4.2.2	4.2.2	4.2.2	4.2.2	4.2.2	4.2.2			
10:	4.2.1	4.2.1	4.2.1	4.2.1	4.2.1	4.2.1	4.2.1	4.2.1			
11:	4.4.6	4.4.6	4.4.6	4.4.6	4.4.6	4.4.6	4.4.6	4.4.6			
12:	4.1.1	4.1.1	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	
13:	4.1.18	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3		
14:	4.1.3	4.1.18	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3		
15:	4.1.3	4.1.3	4.1.3	4.1.3	4.1.3	4.1.3	4.1.3	4.2.1			
16:	4.2.1	4.2.1	4.2.1	4.2.3	4.2.4	4.2.4	4.2.4	4.3.1	4.5.3		
17:	4.1.17	4.3.1	4.3.1	4.3.1	4.3.1	4.3.1	4.3.1	4.3.2			
18:	4.1.11	4.1.11	4.1.11	4.1.11	4.4.7	4.4.8	4.4.8	4.4.8	4.4.8		
19:	4.4.7	4.4.7	4.4.7	4.4.7	4.4.7	4.4.7	4.4.7	4.4.7			
20:	4.3.4	4.3.4	4.3.4	4.3.4	4.3.4	4.3.4	4.3.4	4.3.4			
21:	4.3.2	4.3.3	4.3.3	4.3.3	4.3.3	4.3.3	4.3.3	4.3.3			
22:	4.1.17	4.3	4.3.1	4.3.1	4.3.1	4.3.1	4.3.1	4.3.1	4.3.1		

Table 4.9 (continued)
Objectives Coded to Each Item by Reviewers
West Virginia Grade 4 Mathematics--November 2003

23:	4.1	4.1	4.1	4.1.5	4.1.5	4.1.7	4.1.7	4.1.7			
24:	4.3.6	4.3.6	4.3.6	4.3.6	4.3.6	4.3.6	4.3.6	4.3.6			
25:	4.1.6	4.4.1	4.4.1	4.4.1	4.4.1	4.4.1	4.4.1	4.4.1	4.4.1		
26:	4.3.1	4.3.1	4.3.1	4.3.1	4.3.1	4.3.1	4.3.1	4.3.1			
27:	4.1.5	4.1.8	4.5.2	4.5.2	4.5.2	4.5.2	4.5.2	4.5.2			
28:	4.1.1	4.1.1	4.1.1	4.1.1	4.1.1	4.1.1	4.1.1	4.1.3			
29:	4.1.2	4.4	4.4.5	4.4.5	4.4.5	4.4.5	4.4.5	4.4.5			
30:	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3	4.5.3			
31:	4.4	4.4.5	4.4.5	4.4.5	4.4.5	4.4.5	4.4.5	4.5.3			
32:	4.1.17	4.2.1	4.2.1	4.2.1	4.2.1	4.2.1	4.2.3	4.2.3	4.5.1	4.5.1	4.5.1
33:	4.5.2	4.5.2	4.5.2	4.5.2	4.5.2	4.5.2	4.5.2	4.5.2			
34:	4.2.5	4.2.5	4.2.5	4.2.5	4.2.5	4.2.5	4.2.5	4.2.5			
35:	4.1.5	4.1.5	4.1.5	4.1.5	4.1.5	4.1.5	4.1.5	4.1.17	4.1.17	4.1.17	
36:	4.1.11	4.1.11	4.1.11	4.1.11	4.1.11	4.1.11	4.1.11	4.1.11			
37:	4.1.12	4.1.12	4.1.12	4.1.12	4.1.12	4.1.12	4.1.12	4.1.12			
38:	4.2.1	4.2.1	4.2.1	4.2.1	4.2.1	4.2.1	4.2.1	4.2.1			
39:	4.3.1	4.3.1	4.3.5	4.3.5	4.3.5	4.3.5	4.3.5	4.3.5	4.3.5		
40:	4.1.6	4.1.6	4.1.6	4.1.6	4.1.6	4.1.6	4.1.6	4.1.8			
41:	4.1.4	4.1.10	4.1.10	4.1.10	4.1.10	4.1.10	4.1.10	4.1.10			
42:	4.1.7	4.1.7	4.1.7	4.1.7	4.1.7	4.1.7	4.1.7	4.1.7			
43:	4.1.1	4.1.1	4.1.1	4.1.1	4.1.1	4.1.1	4.1.1	4.1.3			
44:	4.1.16	4.1.16	4.1.16	4.1.16	4.1.16	4.1.16	4.1.16	4.1.16			
45:	4.3.1	4.3.2	4.3.2	4.3.2	4.3.2	4.3.2	4.3.2	4.3.8			

Table 4.10
 Items Coded by Reviewers to Each Objective
 West Virginia Grade 4 Mathematics--November 2003

Low		Medium		High
0		8.7		34

root:	
4.1:	23 23 23
4.1.1:	12 12 28 28 28 28 28 28 28 28 43 43 43 43 43 43 43
4.1.2:	29
4.1.3:	14 15 15 15 15 15 15 15 28 43
4.1.4:	5 5 5 5 5 5 5 41
4.1.5:	23 23 27 35 35 35 35 35 35 35
4.1.6:	7 7 7 7 7 7 25 40 40 40 40 40 40 40 47 48 48 48 48 48 48 48
4.1.7:	4 7 7 23 23 23 42 42 42 42 42 42 42
4.1.8:	27 40
4.1.9:	
4.1.10:	41 41 41 41 41 41 41
4.1.11:	8 8 8 18 18 18 18 36 36 36 36 36 36 36 36
4.1.12:	37 37 37 37 37 37 37
4.1.13:	1 3 3 3 3 3
4.1.14:	1 1 1 2 2 2 2 2 2 2 5
4.1.15:	1 1 1 1 3 3 3 46 46 46 46 46 46 46 48
4.1.16:	44 44 44 44 44 44 44 44
4.1.17:	4 4 4 4 4 4 17 22 32 35 35 35 51
4.1.18:	4 13 14
4.2:	

Table 4.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 4 Mathematics--November 2003

One Reviewer		50 % of Reviewers		All Reviewers
1		4		8
root:				
4.1:	23:3			
4.1.1:	12:2	28:7	43:7	
4.1.2:	29:1			
4.1.3:	14:1	15:7	28:1	43:1
4.1.4:	5:7	41:1		
4.1.5:	23:2	27:1	35:7	
4.1.6:	7:6	25:1	40:7	47:1
4.1.7:	4:1	7:2	23:3	42:8
4.1.8:	27:1	40:1		
4.1.9:				
4.1.10:	41:7			
4.1.11:	8:3	18:4	36:8	
4.1.12:	37:8			
4.1.13:	1:1	3:5		
4.1.14:	1:3	2:8	5:1	
4.1.15:	1:4	3:3	46:7	48:1
4.1.16:	44:8			
4.1.17:	4:6	17:1	22:1	32:1
4.1.18:	4:1	13:1	14:1	
4.2:				

Table 4.11 (continued)

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 4 Mathematics--November 2003

4.2.1:	6:6	10:8	15:1	16:3	32:5	38:8
4.2.2:	9:8	52:8				
4.2.3:	6:1	16:1	32:2	52:1		
4.2.4:	6:1	16:3				
4.2.5:	34:8					
4.3:	22:1					
4.3.1:	16:1	17:6	22:7	26:8	39:2	45:1
4.3.2:	17:1	21:1	45:6	46:1		
4.3.3:	21:7	51:1				
4.3.4:	20:8					
4.3.5:	39:7					
4.3.6:	24:8					
4.3.7:	49:8					
4.3.8:	45:1	47:7				
4.4:	29:1	31:1				
4.4.1:	25:8					
4.4.2:						
4.4.3:	51:7					
4.4.4:						
4.4.5:	29:6	31:6				
4.4.6:	11:8					
4.4.7:	18:1	19:8				
4.4.8:	8:8	18:4				

Table 4.11 (continued)

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 4 Mathematics--November 2003

4.5:							
4.5.1:	32:3						
4.5.2:	27:6	33:8					
4.5.3:	12:8	13:8	14:7	16:1	30:8	31:1	50:1
4.5.4:	50:7						
4.5.5:							

Table 5.1

Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers

West Virginia Grade 5 Mathematics—November 2003

Number of Assessment Items – 52

Standards			Level by Objective			Hits		Cat. Concurr.
Title	Goals #	Objs #	Level	# of objs by Level	% w/in std by Level	Mean	S.D.	
.1 - Num/Oper	13	13.62	1	7	53	20.25	2.54	YES
			2	5	38			
			3	1	7			
5.2 - Algebra	4	4.25	1	1	25	9.12	0.78	YES
			2	3	75			
5.3 - Geometry	6	6.12	1	3	50	9.25	0.66	YES
			2	3	50			
5.4 - Measurement	9	9.25	1	3	33	8.62	0.86	YES
			2	6	66			
5.5 - Data Anal/Prob	5	5.12	2	3	60	7.88	0.78	YES
			3	2	40			
Total	37	38.38	1	14	37	55.12	3.02	
			2	20	54			
			3	3	8			

Table 5.2
Depth-of-Knowledge Consistency Between Standards as Assessment as Rated by Eight Reviewers
West Virginia Grade 5 Mathematics—November 2003
Number of Assessment Items – 52

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.	
Title	Goals #	Objs #	M	S.D.	M	S.D.	M	S.D.	M	S.D.	
5.1 - Num/Oper	13	13.62	20.25	2.54	31	44	54	46	14	32	YES
5.2 - Algebra	4	4.25	9.12	0.78	26	31	68	33	6	19	YES
5.3 - Geometry	6	6.12	9.25	0.66	25	41	53	46	22	40	YES
5.4 - Measurement	9	9.25	8.62	0.86	31	39	56	43	14	33	YES
5.5 - Data Anal/Prob	5	5.12	7.88	0.78	82	28	7	16	11	16	NO
Total	37	38.38	55.12	3.02	34	42	52	44	14	32	

Table 5.3

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

West Virginia Grade 5 Mathematics—November 2003

Number of Assessment Items – 52

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.	
5.1 - Num/Oper	13	13.62	20.25	2.54	10.5	0.87	77	5	YES	37	3	0.79	0.02	YES
5.2 - Algebra	4	4.25	9.12	0.78	4.12	0.60	97	8	YES	17	1	0.75	0.07	YES
5.3 - Geometry	6	6.12	9.25	0.66	5.38	0.70	88	7	YES	17	2	0.79	0.05	YES
5.4 - Measurement	9	9.25	8.62	0.86	6	1	65	10	YES	16	1	0.82	0.03	YES
5.5 - Data Anal/Prob	5	5.12	7.88	0.78	2.88	0.60	56	9	YES	14	2	0.82	0.07	YES
Total	37	38.38	55.12	3.02	5.78	2.71	76	17		20	9	0.79	0.06	

Table 5.4

Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria

Eight Reviewers

West Virginia Grade 5 Mathematics—November 2003

Number of Assessment Items – 52

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
5.1 - Num/Oper	YES	YES	YES	YES
5.2 - Algebra	YES	YES	YES	YES
5.3 - Geometry	YES	YES	YES	YES
5.4 - Measurement	YES	YES	YES	YES
5.5 - Data Anal/Prob	YES	NO	YES	YES

Table 5.5
Source-of-Challenge Issues by Reviewer
West Virginia Grade 5 Mathematics—November 2003

Item Number	Comments by Reviewer
12	All correct. Use "best estimate"
16	If # games (at bats) is large then probability negligible
34	Can get right answer and not know how many sides a hexagonal has. Use dist. with diff. # of sides.
50	Some students may have prior knowledge of this game.

Table 5.6 (Continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 5 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
22	1	2	2	2	2	2	1	2
23	1	2	1	2	2	1	1	1
24	2	2	2	2	2	2	2	2
25	1	1	1	1	1	1	1	1
26	1	1	1	1	1	2	1	1
27	2	2	2	2	2	2	2	1
28	2	2	2	2	2	1	2	2
29	2	2	2	2	2	2	1	1
30	1	1	1	1	1	1	1	1
31	2	2	2	2	2	2	2	2
32	1	1	1	1	1	1	1	1
33	1	1	1	1	1	1	1	1
34	1	1	1	1	1	1	1	1
35	1	1	1	1	1	1	1	1
36	2	2	1	2	2	2	1	2
37	1	1	1	1	2	1	1	1
38	1	1	2	2	2	2	2	2
39	1	1	1	1	1	1	1	1
40	1	1	1	2	1	1	1	1
41	2	2	2	2	3	2	2	2

Table 5.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 5 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	3	3	3	3	3	2	2	3
43	1	1	1	1	1	1	1	1
44	1	2	2	1	1	2	2	2
45	1	2	1	2	1	1	2	1
46	1	1	1	1	1	2	1	2
47	1	2	2	2	1	2	1	2
48	1	1	1	1	1	1	1	1
49	2	2	2	2	2	3	2	2
50	3	3	3	3	3	3	3	3
51	2	2	2	2	3	2	3	2
52	2	2	2	2	3	3	3	2
Intraclass Corr Grade 5 Mathematics					0.935			

Table 5.7
Notes by Reviewer
West Virginia Grade 5 Mathematics—November 2003

Item Number	Comments by Reviewer
2	Weak match
	Not modeling
	Model?
3	Weak match
6	Weak match
8	Order numbers.
9	(#9-16): difference between probably definitely
	No clear match. Not experiment. Not true.
	Weak match
	Weak match to 5.5.4
11	(-6 pattern)

Table 5.7 (continued)

Notes by Reviewer

West Virginia Grade 5 Mathematics—November 2003

Item Number	Comments by Reviewer
12	3 ft = 1 yd
	Not strong
13	Weak match
	Need write number sentences again!
	No clear match
	Write expression
	3rd grade?
15	Weak match
16	"Likely"
	Need more info in stem
17	Easy but 2 patterns
18	Goes beyond standard
19	Weak match

Table 5.7 (continued)

Notes by Reviewer

West Virginia Grade 5 Mathematics—November 2003

Item Number	Comments by Reviewer
22	No match
24	No match
	I don't like this problem.
	Reasoning item
26	Matches earlier grade.
	No match
	(Reviewer put ? after primary objective.)
27	Square numbers become rote
29	Need faces objective again
	Weak match-
32	I wish it would say clockwise or cc (it doesn't matter)
33	Weak
36	Weak

Table 5.7 (continued)

Notes by Reviewer

West Virginia Grade 5 Mathematics—November 2003

Item Number	Comments by Reviewer
38	(Reviewer put ? after primary objective.)
41	Add: "figures not drawn to scale"
43	Not model
46	Actually testing def. Of "clockwise"
47	Weak match
	Not constructing
52	Part a or b is unnecessary.

Table 5.8
DOK Levels and Objectives Coded by Each Reviewer
Grade 5 Mathematics—November 2003
West Virginia

Item	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj
1	1	5.1.10	1	5.1.10	1	5.1.11	1	5.1.11	1	5.1.11	1	5.1.11		1	5.1.11		1	5.1.11	
2	1	5.1.9	1	5.1.10	1	5.1.10	2	5.1.10	1	5.1	1	5.1.10		1	5.1.10		1	5.1	
3	1	5.4.8	1	5.4.8	1	5.4.8	1	5.4.8	1	5.4.8	1	5.4.8		1	5.4.8		1	5.4.8	
4	2	5.1.12	2	5.1.4	2	5.1.11	2	5.1.4	2	5.1.4	2	5.1.4		2	5.1.4		1	5.1.4	
5	2	5.1.4	1	5.1.4	2	5.1.4	2	5.1.4	2	5.1.12	2	5.1.4		2	5.1.4		1	5.1.4	
6	1	5.5.3	1	5.5.3	1	5.5.3	1	5.5.3	1	5.5.3	1	5.5.3		1	5.5.3		1	5.5.3	
7	1	5.5.3	2	5.5.3	2	5.5.3	2	5.5.3	2	5.5.3	2	5.5.3		2	5.5.3		2	5.5.3	
8	1	5.1.1	2	5.1.1	1	5.1.1	1	5.5.3	1	5.1.1	2	5.5.3	5.1.1	1	5.1.1		1	5.1.1	
9	1	5.5	1	5.5.4	1	5.5.4	2	5.5.4	1	5.5.2	2	5.5.2		1	5.5.4	5.5.2	2	5.5.4	
10	1	5.4.7	1	5.4.7	1	5.4.7	1	5.4.7	1	5.4.7	1	5.4.7		1	5.4.7		1	5.4.7	
11	2	5.2.1	2	5.2.1	1	5.2.1	1	5.2.1	1	5.2.1	2	5.2.1		1	5.1.12	5.2.1	1	5.2.1	
12	1	5.4.1	2	5.4.1	2	5.4.1	1	5.4.1	1	5.4.1	2	5.4.1		2	5.4.1		2	5.4.8	
13	1	5.5.4	1	5.2.3	1	5.1.12	1	5.1.11	1	5.1.11	2	5.1.12	5.2	1	5.1.12		1	5.1.11	
14	2	5.1.12	1	5.1.9	2	5.1.8	2	5.1.12	2	5.1.12	2	5.4.7	5.1.12	2	5.1.8		1	5.1.8	
15	1	5.3.1	2	5.3.2	2	5.3.1	1	5.3.5	1	5.3.1	1	5.3.1		1	5.3.1		1	5.3.1	
16	1	5.5.3	1	5.5.3	1	5.5.3	2	5.5.3	1	5.5.3	2	5.5.3		1	5.5.3		1	5.5.2	5.2.1
17	2	5.2.1	2	5.2.1	2	5.2.1	2	5.2.1	1	5.2.1	2	5.2.1		1	5.2.1		2	5.2.1	
18	1	5.1.5	1	5.1.5	1	5.1.5	2	5.1.5	2	5.1.11	1	5.1.5		1	5.1.5		1	5.1.5	
19	1	5.4.8	1	5.4.8	2	5.4.8	1	5.4.1	1	5.4.8	2	5.4.8		1	5.4.1		2	5.4.5	
20	2	5.1.12	2	5.1.12	2	5.1.12	2	5.1.12	2	5.1.12	2	5.1.12	5.1.1	2	5.1.12	5.1.1	2	5.1.12	

Table 5.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 5 Mathematics—November 2003
West Virginia

Item	DOK	PObj	SObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj		DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj
21	1	5.1.7		1	5.1.7	1	5.1.7	1	5.1.7	1	5.1.7		1	5.1.7		1	5.1.7		1	5.1.7	
22	1	5.3		2	5.3.2	2	5.2	2	5.3.2	2	5.3.2		2	5.3.2		1	5.3.2		2	5.3.2	5.3.5
23	1	5.5.2		2	5.5.2	1	5.5.2	2	5.5.2	2	5.5.2		1	5.5.2		1	5.5.3	5.1.7	1	5.5.2	
24	2	5.1.12		2	5.1.12	2	5.1.12	2	5.1.12	2	5.1.12		2	5.1.4	5.1.12	2	5.1.12		2	5.1.12	5.1.4
25	1	5.5.2		1	5.5.2	1	5.5.2	1	5.5.3	1	5.5.2		1	5.5.2		1	5.5.4		1	5.5.2	
26	1	5.1		1	5.1.7	1	5.1	1	5.1.6	1	5.1		2	5.1.7		1	5.1		1	5.1.7	5.1
27	2	5.2.1		2	5.2.1	2	5.2.1	2	5.2.1	2	5.2.1		2	5.2.1		2	5.2.1		1	5.2.1	
28	2	5.4	5.4.5	2	5.4.5	2	5.1.9	2	5.1.9	2	5.4		1	5.1.9		2	5.4.5		2	5.4.5	
29	2	5.3.2		2	5.3.2	2	5.3.2	2	5.3.2	2	5.3.2		2	5.3.2		1	5.3.2		1	5.3.2	
30	1	5.2.2		1	5.1.11	1	5.2.2	1	5.2.2	1	5.2.2		1	5.2.2	5.1.11	1	5.1.11		1	5.2.2	5.1.11
31	2	5.3.6		2	5.4.9	2	5.4.9	2	5.3.6	2	5.4.9		2	5.4.9		2	5.1.12		2	5.4.9	
32	1	5.3.5		1	5.3.5	1	5.3.5	1	5.1.7	1	5.3.2		1	5.3.5		1	5.3.5		1	5.3.5	
33	1	5.1.1		1	5.5.3	1	5.1.1	1	5.3.5	1	5.1.1		1	5.5.3		1	5.1.1		1	5.1.1	
34	1	5.1.3		1	5.1.3	1	5.1.3	1	5.1.3	1	5.1.3		1	5.1.3		1	5.1.3		1	5.1.3	
35	1	5.3.1		1	5.3.1	1	5.3.1	1	5.3.1	1	5.3.1		1	5.3.1		1	5.3.1		1	5.3.1	
36	2	5.4.1	5.1.8	2	5.4.8	1	5.4.1	2	5.4.1	2	5.4.8	5.1.8	2	5.4.1		1	5.4.1	5.1.8	2	5.4.1	
37	1	5.2.4		1	5.2.4	1	5.2.4	1	5.2.3	2	5.2.4		1	5.2.4		1	5.2.4		1	5.2.4	
38	1	5.2.2		1	5.2.2	2	5.2.2	2	5.2.2	2	5.2.2		2	5.2.2		2	5.2.2		2	5.2.2	
39	1	5.1.7		1	5.1.7	1	5.1.7	1	5.1.7	1	5.1.7		1	5.1.7		1	5.1.7		1	5.1.7	
40	1	5.4.2		1	5.4.2	1	5.4.2	2	5.4.2	1	5.4.2		1	5.4.2		1	5.4.2		1	5.4.2	

Table 5.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 5 Mathematics—November 2003
West Virginia

Item	DOK	PObj	DOK	PObj	DOK	PObj	SObj	DOK	PObj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj
41	2	5.4.4	2	5.4.2	2	5.4.4		2	5.4.2	3	5.4.4		2	5.4.2	5.4.4	2	5.4.2		2	5.4.4
42	3	5.3.4	3	5.3.4	3	5.3.4		3	5.3.4	3	5.3.4		2	5.3.4		2	5.3.4		3	5.3.4
43	1	5.1.10	1	5.1.10	1	5.1.10		1	5.1.10	1	5.1.10		1	5.1.10		1	5.1.10		1	5.1.10
44	1	5.2.3	2	5.2.3	2	5.2.3		1	5.2.3	1	5.2.3		2	5.2.3		2	5.2.3		2	5.2.3
45	1	5.1.7	2	5.1.13	1	5.1.13		2	5.1.7	1	5.1.7	5.1.13	1	5.1.13	5.1.7	2	5.1.7		1	5.1.7
46	1	5.3.5	1	5.3.5	1	5.3.5		1	5.3.5	1	5.3.5		2	5.3.5		1	5.3.5		2	5.3.5
47	1	5.3.2	2	5.3.2	2	5.3.2		2	5.3.5	1	5.3.2		2	5.3.5		1	5.3.2		2	5.3.2
48	1	5.3.3	1	5.3.3	1	5.3.3		1	5.3.3	1	5.3.3		1	5.3.3		1	5.3.3		1	5.3.3
49	2	5.2.1	2	5.2.1	2	5.2.1		2	5.2.3	2	5.2.1		3	5.2.1		2	5.2.2		2	5.2.1
50	3	5.5.2	3	5.5.2	3	5.5.2		3	5.5.2	3	5.5.2		3	5.5.2		3	5.5.2		3	5.5.2
51	2	5.2.2	2	5.2.2	2	5.2.2	5.1.11	2	5.5.2	3	5.2.2		2	5.2.2	5.1.11	3	5.2.2	5.1.11	2	5.2.2
52	2	5.1.9	2	5.1.9	2	5.1.9		2	5.1.9	3	5.1.9		3	5.1.9		3	5.1.9		2	5.1.9

Table 5.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 5 Mathematics--November 2003

Low									Medium			High
8									8.480769			11
1:	5.1.10	5.1.10	5.1.11	5.1.11	5.1.11	5.1.11	5.1.11	5.1.11	5.1.11			
2:	5.1	5.1	5.1.9	5.1.10	5.1.10	5.1.10	5.1.10	5.1.10	5.1.10			
3:	5.4.8	5.4.8	5.4.8	5.4.8	5.4.8	5.4.8	5.4.8	5.4.8	5.4.8			
4:	5.1.4	5.1.4	5.1.4	5.1.4	5.1.4	5.1.4	5.1.4	5.1.11	5.1.12			
5:	5.1.4	5.1.4	5.1.4	5.1.4	5.1.4	5.1.4	5.1.4	5.1.4	5.1.12			
6:	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3			
7:	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3			
8:	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.5.3	5.5.3		
9:	5.5	5.5.2	5.5.2	5.5.2	5.5.4	5.5.4	5.5.4	5.5.4	5.5.4	5.5.4		
10:	5.4.7	5.4.7	5.4.7	5.4.7	5.4.7	5.4.7	5.4.7	5.4.7	5.4.7			
11:	5.1.12	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1		
12:	5.4.1	5.4.1	5.4.1	5.4.1	5.4.1	5.4.1	5.4.1	5.4.1	5.4.8			
13:	5.1.11	5.1.11	5.1.11	5.1.12	5.1.12	5.1.12	5.2	5.2.3	5.5.4			
14:	5.1.8	5.1.8	5.1.8	5.1.9	5.1.12	5.1.12	5.1.12	5.1.12	5.1.12	5.4.7		
15:	5.3.1	5.3.1	5.3.1	5.3.1	5.3.1	5.3.1	5.3.1	5.3.2	5.3.5			
16:	5.2.1	5.5.2	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3	5.5.3		
17:	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1			
18:	5.1.5	5.1.5	5.1.5	5.1.5	5.1.5	5.1.5	5.1.5	5.1.5	5.1.11			
19:	5.4.1	5.4.1	5.4.5	5.4.8	5.4.8	5.4.8	5.4.8	5.4.8	5.4.8			
20:	5.1.1	5.1.1	5.1.12	5.1.12	5.1.12	5.1.12	5.1.12	5.1.12	5.1.12	5.1.12	5.1.12	
21:	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7			
22:	5.2	5.3	5.3.2	5.3.2	5.3.2	5.3.2	5.3.2	5.3.2	5.3.2	5.3.5		

Table 5.9 (continued)
Objectives Coded to Each Item by Reviewers
West Virginia Grade 5 Mathematics--November 2003

23:	5.1.7	5.5.2	5.5.2	5.5.2	5.5.2	5.5.2	5.5.2	5.5.2	5.1.7	5.5.3		
24:	5.1.4	5.1.4	5.1.12	5.1.12	5.1.12	5.1.12	5.1.12	5.1.12	5.1.4	5.1.12	5.1.12	
25:	5.5.2	5.5.2	5.5.2	5.5.2	5.5.2	5.5.2	5.5.3	5.5.4	5.5.2			
26:	5.1	5.1	5.1	5.1	5.1	5.1.6	5.1.7	5.1.7	5.1	5.1.7		
27:	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1		
28:	5.1.9	5.1.9	5.1.9	5.4	5.4	5.4.5	5.4.5	5.4.5	5.1.9	5.4.5		
29:	5.3.2	5.3.2	5.3.2	5.3.2	5.3.2	5.3.2	5.3.2	5.3.2	5.3.2			
30:	5.1.11	5.1.11	5.1.11	5.1.11	5.2.2	5.2.2	5.2.2	5.2.2	5.1.11	5.2.2	5.2.2	
31:	5.1.12	5.3.6	5.3.6	5.4.9	5.4.9	5.4.9	5.4.9	5.4.9	5.1.12			
32:	5.1.7	5.3.2	5.3.5	5.3.5	5.3.5	5.3.5	5.3.5	5.3.5	5.1.7			
33:	5.1.1	5.1.1	5.1.1	5.1.1	5.1.1	5.3.5	5.5.3	5.5.3	5.1.1			
34:	5.1.3	5.1.3	5.1.3	5.1.3	5.1.3	5.1.3	5.1.3	5.1.3	5.1.3			
35:	5.3.1	5.3.1	5.3.1	5.3.1	5.3.1	5.3.1	5.3.1	5.3.1	5.3.1			
36:	5.1.8	5.1.8	5.1.8	5.4.1	5.4.1	5.4.1	5.4.1	5.4.1	5.1.8	5.4.1	5.4.8	5.4.8
37:	5.2.3	5.2.4	5.2.4	5.2.4	5.2.4	5.2.4	5.2.4	5.2.4	5.2.3			
38:	5.2.2	5.2.2	5.2.2	5.2.2	5.2.2	5.2.2	5.2.2	5.2.2	5.2.2			
39:	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7			
40:	5.4.2	5.4.2	5.4.2	5.4.2	5.4.2	5.4.2	5.4.2	5.4.2	5.4.2			
41:	5.4.2	5.4.2	5.4.2	5.4.2	5.4.4	5.4.4	5.4.4	5.4.4	5.4.2	5.4.4		
42:	5.3.4	5.3.4	5.3.4	5.3.4	5.3.4	5.3.4	5.3.4	5.3.4	5.3.4			
43:	5.1.10	5.1.10	5.1.10	5.1.10	5.1.10	5.1.10	5.1.10	5.1.10	5.1.10			
44:	5.2.3	5.2.3	5.2.3	5.2.3	5.2.3	5.2.3	5.2.3	5.2.3	5.2.3			
45:	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7	5.1.7	5.1.13	5.1.13	5.1.7	5.1.13	5.1.13	
46:	5.3.5	5.3.5	5.3.5	5.3.5	5.3.5	5.3.5	5.3.5	5.3.5	5.3.5			

Table 5.9 (continued)
Objectives Coded to Each Item by Reviewers
West Virginia Grade 5 Mathematics--November 2003

47:	5.3.2	5.3.2	5.3.2	5.3.2	5.3.2	5.3.2	5.3.5	5.3.5				
48:	5.3.3	5.3.3	5.3.3	5.3.3	5.3.3	5.3.3	5.3.3	5.3.3				
49:	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.1	5.2.2	5.2.3				
50:	5.5.2	5.5.2	5.5.2	5.5.2	5.5.2	5.5.2	5.5.2	5.5.2				
51:	5.1.11	5.1.11	5.1.11	5.2.2	5.2.2	5.2.2	5.2.2	5.2.2	5.2.2	5.2.2	5.2.2	5.2.2
52:	5.1.9	5.1.9	5.1.9	5.1.9	5.1.9	5.1.9	5.1.9	5.1.9				

Table 5.10
 Items Coded by Reviewers to Each Objective
 West Virginia Grade 5 Mathematics--November 2003

Low		Medium		High
0		10.25581		31

root:	
5.1:	2 2 26 26 26 26 26
5.1.1:	8 8 8 8 8 8 8 20 20 33 33 33 33 33
5.1.2:	
5.1.3:	34 34 34 34 34 34 34 34
5.1.4:	4 4 4 4 4 4 5 5 5 5 5 5 5 24 24
5.1.5:	18 18 18 18 18 18 18
5.1.6:	26
5.1.7:	21 21 21 21 21 21 21 21 21 23 26 26 26 32 39 39 39 39 39 39 39 39 45 45 45 45 45 45
5.1.8:	14 14 14 36 36 36
5.1.9:	2 14 28 28 28 52 52 52 52 52 52 52
5.1.10:	1 1 2 2 2 2 2 43 43 43 43 43 43 43 43
5.1.11:	1 1 1 1 1 1 4 13 13 13 18 30 30 30 30 51 51 51
5.1.12:	4 5 11 13 13 13 14 14 14 14 20 20 20 20 20 20 20 24 24 24 24 24 24 24 24 31
5.1.13:	45 45 45 45
5.2:	13 22
5.2.1:	11 11 11 11 11 11 11 11 11 16 17 17 17 17 17 17 17 17 17 27 27 27 27 27 27 27 27 49 49 49 49 49 49
5.2.2:	30 30 30 30 30 30 38 38 38 38 38 38 38 38 49 51 51 51 51 51 51 51
5.2.3:	13 37 44 44 44 44 44 44 44 44 49
5.2.4:	37 37 37 37 37 37 37
5.3:	22
5.3.1:	15 15 15 15 15 15 35 35 35 35 35 35 35 35 35

Table 5.10 (continued)

Items Coded by Reviewers to Each Objective

West Virginia Grade 5 Mathematics--November 2003

5.3.2:	15	22	22	22	22	22	22	29	29	29	29	29	29	29	29	29	32	47	47	47	47	47	47									
5.3.3:	48	48	48	48	48	48	48	48																								
5.3.4:	42	42	42	42	42	42	42	42																								
5.3.5:	15	22	32	32	32	32	32	32	33	46	46	46	46	46	46	46	46	46	47	47												
5.3.6:	31	31																														
5.4:	28	28																														
5.4.1:	12	12	12	12	12	12	12	19	19	36	36	36	36	36	36																	
5.4.2:	40	40	40	40	40	40	40	40	41	41	41	41																				
5.4.3:																																
5.4.4:	41	41	41	41	41																											
5.4.5:	19	28	28	28	28																											
5.4.6:																																
5.4.7:	10	10	10	10	10	10	10	10	14																							
5.4.8:	3	3	3	3	3	3	3	3	12	19	19	19	19	19	36	36																
5.4.9:	31	31	31	31	31																											
5.5:	9																															
5.5.1:																																
5.5.2:	9	9	9	16	23	23	23	23	23	23	23	23	25	25	25	25	25	25	50	50	50	50	50	50	50	50	51					
5.5.3:	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	8	8	16	16	16	16	16	16	16	16	16	23	25	33	33
5.5.4:	9	9	9	9	9	13	25																									
5.5.5:																																

Table 5.11

*Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 5 Mathematics--November 2003*

One Reviewer		50 % of Reviewers		All Reviewers
1		4		8
root:				
5.1:	2:2 26:5			
5.1.1:	8:7 20:2 33:5			
5.1.2:				
5.1.3:	34:8			
5.1.4:	4:6 5:7 24:2			
5.1.5:	18:7			
5.1.6:	26:1			
5.1.7:	21:8 23:1 26:3 32:1 39:8 45:6			
5.1.8:	14:3 36:3			
5.1.9:	2:1 14:1 28:2 52:8			
5.1.10:	1:2 2:5 43:8			
5.1.11:	1:5 4:1 13:3 18:1 30:4 51:3			
5.1.12:	4:1 5:1 11:1 13:3 14:4 20:8 24:8 31:1			
5.1.13:	45:4			
5.2:	13:1 22:1			
5.2.1:	11:8 16:1 17:8 27:8 49:6			
5.2.2:	30:6 38:8 49:1 51:7			
5.2.3:	13:1 37:1 44:8 49:1			

Table 5.11 (continued)

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)

West Virginia Grade 5 Mathematics--November 2003

5.2.4:	37:7
5.3:	22:1
5.3.1:	15:6 35:8
5.3.2:	15:1 22:6 29:8 32:1 47:6
5.3.3:	48:8
5.3.4:	42:8
5.3.5:	15:1 22:1 32:6 33:1 46:8 47:2
5.3.6:	31:2
5.4:	28:2
5.4.1:	12:7 19:2 36:6
5.4.2:	40:8 41:4
5.4.3:	
5.4.4:	41:5
5.4.5:	19:1 28:4
5.4.6:	
5.4.7:	10:8 14:1
5.4.8:	3:8 12:1 19:5 36:2
5.4.9:	31:5
5.5:	9:1
5.5.1:	
5.5.2:	9:3 16:1 23:7 25:6 50:8 51:1
5.5.3:	6:8 7:8 8:2 16:7 23:1 25:1 33:2
5.5.4:	9:5 13:1 25:1
5.5.5:	

Table 6.1
Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 6 Mathematics—November 2003
Number of Assessment Items—52

Standards			Level by Objective			Hits		Cat. Concurr.
Title	Goals #	Objs #	Level	# of objs by Level	% w/in std by Level	Mean	S.D.	
6.1 - Num/Oper	9	9.75	1 2	5 4	55 44	13.75	1.09	YES
6.2 – Algebra	9	9.12	1 2 3	4 4 1	44 44 11	13.88	1.69	YES
6.3 - Geometry	6	6.62	1 2	5 1	83 16	10	0	YES
6.4 - Measurement	6	6	2 3	5 1	83 16	7.75	1.20	YES
6.5 - Data Analy/Prob	4	4.12	2	4	100	7.88	1.05	YES
Total	34	35.62	1 2 3	14 18 2	41 52 5	53.25	0.97	

Table 6.2
Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 6 Mathematics—November 2003
Number of Assessment Items—52

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.	
6.1 - Num/Oper	9	9.75	13.75	1.09	31	43	57	46	12	32	YES
6.2 – Algebra	9	9.12	13.88	1.69	19	34	74	35	7	19	YES
6.3 - Geometry	6	6.62	10	0	6	15	78	36	17	30	YES
6.4 - Measurement	6	6	7.75	1.20	57	42	43	42	0	0	WEAK
6.5 – Data Analy/Prob	4	4.12	7.88	1.05	67	40	26	33	7	10	NO
Total	34	35.62	53.25	0.97	31	41	60	43	9	24	

Table 6.3

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

West Virginia Grade 6 Mathematics—November 2003

Number of Assessment Items—52

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.	
6.1 - Num/Oper	9	9.75	13.75	1.09	6.38	1.11	65	10	YES	26	2	0.63	0.07	WEAK
6.2 - Algebra	9	9.12	13.88	1.69	6.88	1.17	75	11	YES	26	3	0.75	0.04	YES
6.3 - Geometry	6	6.62	10	0	5.5	0.5	83	5	YES	19	0	0.77	0.03	YES
6.4 - Measurement	6	6	7.75	1.20	4.38	0.48	73	8	YES	15	2	0.79	0.04	YES
6.5 - Data Analy/Prob	4	4.12	7.88	1.05	3.12	0.60	76	13	YES	15	2	0.71	0.05	YES
Total	34	35.62	53.25	0.97	5.25	1.59	74	11		20	5	0.73	0.08	

Table 6.4

*Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers*

West Virginia Grade 6 Mathematics—November 2003

Number of Assessment Items—52

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of- Knowledge Consistency	Range of Knowledge	Balance of Representation
6.1 - Num/Oper	YES	YES	YES	WEAK
6.2 - Algebra	YES	YES	YES	YES
6.3 - Geometry	YES	YES	YES	YES
6.4 - Measurement	YES	WEAK	YES	YES
6.5 - Data Analy/Prob	YES	NO	YES	YES

Table 6.5
Source-of-Challenge Issues by Reviewer
West Virginia Grade 6 Mathematics—November 2003

Item Number	Comments by Reviewer
7	Equivalent fractions
14	Equivalent fractions
30	Will the graphic be better? It needs to be!
31	Confusing chart!
32	Confusing chart!
51	Should use depth of pool not depth of water. Should say rectangular?
52	Rectangular pool filled to 8 ft-max, or 10 ft to top
	Is it a rectangular pool, is it filled to the top?
	Need height of pool and rectangular prism (Reviewer put "V" by primary objective & "S.A. by secondary objective.)

Table 6.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 6 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1
3	1	1	2	1	2	2	1	1
4	1	1	1	1	1	1	1	1
5	1	1	2	2	2	2	2	1
6	1	1	1	1	1	1	1	1
7	1	2	1	1	1	1	1	1
8	1	1	1	1	2	1	1	1
9	2	1	1	1	1	2	1	2
10	1	1	2	2	2	2	1	1
11	1	1	1	2	1	1	1	1
12	1	2	2	2	2	2	1	2
13	1	1	1	1	1	1	2	1
14	1	1	1	1	1	1	2	1
15	1	1	1	1	1	2	2	1
16	1	2	2	2	2	2	1	1
17	2	2	2	1	2	2	2	2
18	1	2	2	1	2	2	1	2
19	1	1	2	2	1	2	1	2
20	1	1	1	1	1	1	1	1
21	1	1	1	1	2	2	1	2

Table 6.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 6 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	1	1	1	1	2	2	1	2
43	1	2	1	1	1	2	1	1
44	1	1	1	1	2	1	1	1
45	1	1	1	1	1	1	1	1
46	1	1	1	1	1	1	1	1
47	2	1	1	1	2	2	1	1
48	2	2	2	1	1	2	2	2
49	3	3	3	3	3	3	3	3
50	3	3	2	3	3	3	3	3
51	1	2	2	3	2	2	2	2
52	2	2	3	3	2	3	3	2
Intraclass Corr Grade 6 Mathematics					0.916			

Table 6.7
Notes by Reviewer
West Virginia Grade 6 Mathematics—November 2003

Item Number	Comments by Reviewer
7	Equivalent fractions not an objective in number
	Not a good match
	Equivalent fractions in 4th grade
	No equivalent fraction object
	Equivalent fraction (Reviewer put ? after primary objective.)
8	50% is rote
9	Weak match
10	Used more than just the operation, #s included too.
12	Needs to be in algebra
14	Fraction to fraction in lowest xx earlier objective.
	No equivalent fraction
	Equivalent fraction (Reviewer put ? after primary objective.)
	No equivalent fraction object
	Ratios
16	Good item
17	Weak match "key" is hard to see
18	3 levels
19	Perimeter
	(Reviewer put? after secondary objective.)
21	Cong.
22	Determine scale.

Table 6.7 (continued)

Notes by Reviewer

West Virginia Grade 6 Mathematics—November 2003

Item Number	Comments by Reviewer
24	"Greatest chance"
26	Good item
27	Weak match
	Don't "apply formula"
28	Earlier standard
	No obtuse angles
	(Reviewer put? after primary objective.)
	No obtuse < object
29	Don't construct but use scale
31	Ambiguous
	Bad graph
	Still don't like
32	Bad graph
	I don't like picture
33	3rd grade objective
37	Mean, median, mode 5th grade objective
	Mode
38	Don't "construct"
39	Fits lower grade level standard.
42	Did plotting used to be in meas?
44	Cross multip. is an algorithm.

Table 6.7 (continued)

Notes by Reviewer

West Virginia Grade 6 Mathematics—November 2003

Item Number	Comments by Reviewer
47	Solve equation
48	Square numbers.
51	Multi-step, but rote
52	What is the depth? Rectangular pool?

Table 6.8
DOK Levels and Objectives Coded by Each Reviewer
Grade 6 Mathematics—November 2003
West Virginia

Item	DOK	Pobj	S1Obj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj
1	1	6.1.6		1	6.1.6	1	6.1.6	1	6.1.6	1	6.1.6	1	6.1.6		1	6.1.6		1	6.1.6
2	1	6.1.6		1	6.1.6	1	6.1.6	1	6.1.6	1	6.1.6	1	6.1.6		1	6.1.6		1	6.1.6
3	1	6.1.5		1	6.1.6	2	6.1.5	1	6.1.6	2	6.1.5	2	6.1.6		1	6.1		1	6.1.5
4	1	6.1.6		1	6.1.6	1	6.1.6	1	6.1.6	1	6.1.6	1	6.1.6		1	6.1.6		1	6.2.5
5	1	6.1.6		1	6.5.1	2	6.1.6	2	6.5.1	2	6.5.1	2	6.5.1		2	6.5.1		1	6.1.6
6	1	6.1.6		1	6.1.6	1	6.1.6	1	6.1.6	1	6.1.6	1	6.1.6		1	6.4.3		1	6.1.6
7	1	6.1		2	6.1.8	1	6.1	1	6.1.6	1	6.1	1	6.1		1	6.1		1	6.1.6
8	1	6.1.9		1	6.1.9	1	6.1.9	1	6.1.9	2	6.1.9	1	6.1.9		1	6.1.9	6.1.6	1	6.1.9
9	2	6.1.4		1	6.1.4	1	6.1.4	1	6.1.4	1	6.2.9	2	6.1.4		1	6.2.9		2	6.1.4
10	1	6.2.4		1	6.2.4	2	6.2.4	2	6.2.4	2	6.2.4	2	6.2.4		1	6.2.4		1	6.2.4
11	1	6.4.3		1	6.4.3	1	6.4.3	2	6.4.3	1	6.4.3	1	6.4.3		1	6.4.3		1	6.4.3
12	1	6.5.1		2	6.5.1	2	6.5.1	2	6.5.1	2	6.5.1	2	6.5.1		1	6.5.1		2	6.5.1
13	1	6.1.7		1	6.1.7	1	6.1.7	1	6.1.7	1	6.1.7	1	6.1.6		2	6.2.7	6.1.7	1	6.1.7
14	1	6.1		1	6.1.6	1	6.1.8	1	6.1.6	1	6.1	1	6.1		2	6.1		1	6.1.6
15	1	6.1.5		1	6.1.6	1	6.1.6	1	6.1.6	1	6.1.5	2	6.1.5		2	6.1.6		1	6.1.5
16	1	6.3.6		2	6.3.6	2	6.3.6	2	6.3.6	2	6.3.6	2	6.3.6		1	6.3		1	6.3.6
17	2	6.4.6		2	6.4.6	2	6.4.6	1	6.4.6	2	6.4.5	2	6.4.5		2	6.4.5		2	6.2.5
18	1	6.2.2		2	6.2.2	2	6.2.2	1	6.2.2	2	6.2.2	2	6.2.2		1	6.2.2		2	6.2.2
19	1	6.4.2		1	6.4.2	2	6.4.2	2	6.4.2	1	6.4.2	2	6.4.2	6.4.5	1	6.4.5	6.4.2	2	6.4.2
20	1	6.3.1		1	6.3.1	1	6.3.1	1	6.3.1	1	6.3.1	1	6.3.1		1	6.3.1		1	6.3.1

Table 6.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 6 Mathematics—November 2003
West Virginia

Item	DOK	PObj	SIObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	SIObj	DOK	PObj	SIObj	DOK	PObj	SIObj
21	1	6.3.6		1	6.3.6	1	6.3.6	1	6.3.6	2	6.3.6	2	6.3.6		1	6.3.6		2	6.3.6	
22	2	6.4.6		1	6.4.6	2	6.4.6	2	6.4.6	2	6.4.6	2	6.4.6		2	6.4.6		2	6.2.5	
23	2	6.5.1		1	6.5.1	2	6.1.6	1	6.5.1	2	6.5.1	2	6.5.1		2	6.5.1		2	6.5.1	
24	1	6.5.3		1	6.5.3	1	6.5	1	6.5.3	1	6.5.4	1	6.5.3		1	6.5.3		1	6.5.3	
25	2	6.1.6		1	6.1.6	2	6.1.6	1	6.1.6	2	6.1.6	1	6.1.6		2	6.1.6		2	6.1.6	6.1.7
26	2	6.2.6		2	6.2.2	2	6.2.2	2	6.2.2	2	6.2.2	3	6.2.2		2	6.2.2		2	6.2.2	
27	1	6.4.2		1	6.4.2	1	6.4.2	1	6.4.2	1	6.2.9	1	6.4.2		1	6.4.2		1	6.4.2	
28	1	6.3		1	6.3	1	6.3	2	6.3.2	1	6.3.2	1	6.3.4		1	6.3		1	6.3	
29	2	6.4.6		1	6.4.6	1	6.4.6	1	6.4.6	1	6.4.6	2	6.4.5		1	6.5.1		1	6.2.5	
30	1	6.3.1		1	6.3.1	1	6.3.1	1	6.3.1	1	6.3.1	1	6.3.1		1	6.3.1		1	6.3.1	
31	1	6.2.2		2	6.5.1	2	6.2.2	2	6.2.2	2	6.2.2	2	6.5.1		1	6.5.1		1	6.2.2	
32	1	6.5.1		2	6.5.1	2	6.5.1	2	6.5.1	2	6.5.1	2	6.5.1		2	6.5.1		1	6.5.1	
33	1	6.3.5		1	6.3.5	1	6.3.5	1	6.3.5	1	6.3.5	1	6.3.5		1	6.3		1	6.3.5	
34	2	6.2.2		2	6.2.2	2	6.2.2	1	6.2.2	1	6.2.2	2	6.2.2		1	6.2.2		2	6.2.2	
35	1	6.3.1		1	6.3.1	1	6.3.1	1	6.3.1	2	6.3.1	1	6.3.1		1	6.3.1		1	6.3.1	
36	1	6.5.3		1	6.5.3	2	6.5.3	2	6.5.3	1	6.5.3	1	6.5.3		2	6.5.3		1	6.5.3	
37	1	6.5.2		1	6.5.2	1	6.5.2	1	6.5.2	1	6.5.2	1	6.5.2		2	6.2		1	6.5.2	
38	1	6.4.6		1	6.4.6	2	6.4.6	2	6.4.6	1	6.4.6	2	6.4.6		2	6.1.6		2	6.2.5	6.4.6
39	1	6.2.1		1	6.1	1	6.2.1	1	6.2.1	1	6.2.1	1	6.2.1		1	6.2.1		1	6.2.1	
40	1	6.2.6		1	6.2.6	1	6.2.6	1	6.2.1	1	6.2.6	1	6.2.6		1	6.2.9		1	6.2.6	

Table 6.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 6 Mathematics—November 2003
West Virginia

Item	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj
41	1	6.3.2		1	6.3.2	2	6.3.2	2	6.3.2	2	6.3.2	2	6.3.2		1	6.3.2	2	6.3.2
42	1	6.2.8		2	6.2.8	1	6.2.8	1	6.2.8	1	6.2.8	1	6.2.8		1	6.2.8	1	6.2.8
43	1	6.2.4		2	6.2.4	1	6.2.4	1	6.2.4	1	6.2.4	2	6.2.4		1	6.2.4	1	6.1.6
44	1	6.2.5		1	6.2.5	1	6.2.5	1	6.2.5	2	6.2.9	1	6.2.5		1	6.2.5	1	6.2.5
45	1	6.2.1		1	6.2.1	1	6.2.1	1	6.2.1	1	6.2.1	1	6.2.1		1	6.2.1	1	6.2.1
46	1	6.3.4		1	6.3.4	1	6.3.4	1	6.3.4	1	6.3.4	1	6.3.4		1	6.3.4	1	6.3.4
47	2	6.2.1		1	6.2.1	1	6.2.1	1	6.2.1	2	6.2.1	2	6.2.9	6.2.1	1	6.2.1	1	6.2.1
48	2	6.2.3		2	6.2.2	2	6.2.3	1	6.2.2	1	6.2.2	2	6.2.3		2	6.2.3	2	6.2.3
49	3	6.5.1		3	6.5.1	3	6.5.1	3	6.5.1	3	6.5.1	3	6.5.1		3	6.5.1	3	6.5.1
50	3	6.3.6		3	6.3.6	2	6.3.6	3	6.3.6	3	6.3.6	3	6.3.6		3	6.3.6	3	6.3.6
51	1	6.1.2	6.1.3	2	6.1.3	2	6.1.3	3	6.1.3	2	6.1.3	2	6.1.3		2	6.1.3	2	6.1.3
52	2	6.4.4		2	6.4.4	3	6.4.4	3	6.4.4	2	6.4.4	3	6.4.4		3	6.4.4	2	6.4.4

Table 6.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
 West Virginia Grade 6 Mathematics--November 2003

One Reviewer		50 % of Reviewers		All Reviewers
1		4		8
root:				
6.1:	3:1	7:5	14:4	39:1
6.1.1:				
6.1.2:	5:1			
6.1.3:	5:8			
6.1.4:	9:6			
6.1.5:	3:4	15:4		
6.1.6:	1:8	2:8	3:3	4:7
6.1.7:	13:7	25:1	5:3	6:7
6.1.8:	7:1	14:1	7:2	8:1
6.1.9:	8:8		13:1	14:3
6.2:	37:1		15:4	23:1
6.2.1:	39:7	40:1	25:8	38:1
6.2.2:	18:8	26:7	31:5	34:8
6.2.3:	48:5		48:3	
6.2.4:	10:8	43:7		
6.2.5:	4:1	17:1	22:1	29:1
6.2.6:	26:1	40:6	38:1	44:7
6.2.7:	13:1		50:1	
6.2.8:	42:8			
6.2.9:	9:2	27:1	40:1	44:1
6.3:	16:1	28:5	33:1	
6.3.1:	20:8	30:8	35:8	
6.3.2:	28:2	41:8		
6.3.3:				
6.3.4:	28:1	46:8		
6.3.5:	33:7			
6.3.6:	16:7	21:8	50:8	
6.4:				
6.4.1:				
6.4.2:	19:8	27:7		
6.4.3:	6:1	11:8		
6.4.4:	52:9			
6.4.5:	17:3	19:2	29:1	
6.4.6:	17:4	22:7	29:5	38:7

Table 6.11 (continued)

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 6 Mathematics--November 2003

6.5:	24:1						
6.5.1:	5:5	12:8	23:7	29:1	31:3	32:8	49:8
6.5.2:	37:7						
6.5.3:	24:6	36:8					
6.5.4:	24:1						

Table 7.1

Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers

West Virginia Grade 7 Mathematics—November 2003

Number of Assessment Items—52

Standards			Level by Objective			Hits		Cat. Concurr.
Title	Goals #	Objs #	Level	# of objs by Level	% w/in std by Level	Mean	S.D.	
7.1 - Num/Oper	8	8.25	1 2 3	2 5 1	25 62 12	12.62	2.55	YES
7.2 - Algebra	13	13.12	1 2 3	4 6 3	30 46 23	14.12	2.52	YES
7.3 - Geometry	7	7	1 2 3	4 2 1	57 28 14	8	0.5	YES
7.4 - Measurement	4	4.5	1 2	2 2	50 50	8.5	1.12	YES
7.5 – Data Analy/Prob	4	4.75	2 3	1 3	25 75	10.75	0.83	YES
Total	36	37.62	1 2 3	12 16 8	33 44 22	54	1.22	

Table 7.2
Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 7 Mathematics—November 2003
Number of Assessment Items—52

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.	
7.1 - Num/Oper	8	8.25	12.62	2.55	66	43	33	44	0	3	NO
7.2 - Algebra	13	13.12	14.12	2.52	50	48	37	44	13	31	WEAK
7.3 - Geometry	7	7	8	0.5	31	42	56	41	13	28	YES
7.4 - Measurement	4	4.5	8.5	1.12	27	38	40	39	33	38	YES
7.5 - Data Analy/Prob	4	4.75	10.75	0.83	72	42	28	42	0	0	NO
Total	36	37.62	54	1.22	52	47	38	44	10	27	

Table 7.3

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

West Virginia Grade 7 Mathematics—November 2003

Number of Assessment Items—52

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.	
7.1 - Num/Oper	8	8.25	12.62	2.55	6.75	1.39	81	14	YES	23	5	0.75	0.06	YES
7.2 - Algebra	13	13.12	14.12	2.52	9.38	1.49	71	11	YES	26	5	0.77	0.03	YES
7.3 - Geometry	7	7	8	0.5	4.38	0.48	62	7	YES	15	1	0.90	0.06	YES
7.4 - Measurement	4	4.5	8.5	1.12	3.25	1.09	71	17	YES	16	2	0.78	0.12	YES
7.5 - Data Analy/Prob	4	4.75	10.75	0.83	4.5	0.87	94	11	YES	20	2	0.74	0.07	YES
Total	36	37.62	54	1.22	5.65	2.46	76	17		20	5	0.79	0.09	

Table 7.4

*Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers*

West Virginia Grade 7 Mathematics—November 2003

Number of Assessment Items—52

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of- Knowledge Consistency	Range of Knowledge	Balance of Representation
7.1 - Num/Oper	YES	NO	YES	YES
7.2 - Algebra	YES	WEAK	YES	YES
7.3 - Geometry	YES	YES	YES	YES
7.4 - Measurement	YES	YES	YES	YES
7.5 - Data Analy/Prob	YES	NO	YES	YES

Table 7.5
Source-of-Challenge Issues by Reviewer
West Virginia Grade 7 Mathematics—November 2003

Item Number	Comments by Reviewer
9	Need tick marks on x -axis
	Should not be line graph.
	Scatter Plot - (Need another)
12	No circle graph
33	Cone is also possible. So is prism. (do you have to use all?)
48	Confusing. $3 + 12 =$ flat rate??

Table 7.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 7 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
1	1	1	1	1	1	1	1	1
2	1	2	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1
4	2	1	2	1	1	2	2	2
5	1	1	1	1	2	2	2	2
6	1	1	1	1	1	1	1	1
7	1	1	1	1	1	2	1	1
8	2	2	2	1	1	2	1	1
9	1	2	1	1	2	2	2	1
10	2	2	2	2	2	2	2	2
11	2	2	2	1	2	3	1	2
12	2	2	2	2	1	2	2	2
13	2	2	2	2	2	2	1	2
14	1	1	1	1	1	1	2	1
15	1	2	2	1	2	2	1	2
16	1	2	2	2	2	1	1	1
17	2	2	2	2	2	2	2	2
18	1	1	1	2	2	1	2	1
19	2	1	2	2	2	2	2	2
20	1	2	2	1	1	1	1	1
21	2	1	2	2	1	2	2	2

Table 7.6 (Continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 7 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
22	2	2	2	1	2	2	2	2
23	1	1	2	2	1	1	1	1
24	2	2	2	2	2	3	2	2
25	1	1	1	1	1	1	1	1
26	1	1	2	1	1	1	1	1
27	1	1	1	1	1	1	1	1
28	2	2	2	2	1	2	2	2
29	1	1	2	2	2	2	1	1
30	1	1	2	1	1	2	2	2
31	2	2	2	2	2	3	2	2
32	1	1	2	1	1	2	1	2
33	1	2	1	1	2	2	2	2
34	1	1	1	1	1	1	1	1
35	1	2	2	1	1	2	1	2
36	1	1	2	2	1	1	1	2
37	1	1	1	1	1	1	2	2
38	1	1	1	1	1	1	1	1
39	1	2	2	2	1	2	2	1
40	1	1	2	2	1	2	2	2
41	1	3	1	1	1	1	2	1

Table 7.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 7 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	2	1	2	1	2	2	2	2
43	1	2	1	2	1	1	2	1
44	1	2	1	2	1	1	2	2
45	1	1	1	2	2	2	2	1
46	1	1	1	2	1	1	1	1
47	2	1	1	1	2	2	1	2
48	1	3	1	1	1	1	1	1
49	3	2	3	3	2	3	2	2
50	2	2	2	3	2	3	3	2
51	3	3	2	2	3	3	3	3
52	3	3	2	3	3	3	3	2
Intraclass Corr Grade 7 Mathematics					0.875			

Table 7.7
Notes by Reviewer
West Virginia Grade 7 Mathematics—November 2003

Item Number	Comments by Reviewer
6	What makes a prediction "best"?
11	(Reviewer put ? after DOK)
12	Circle graph=not mentioned
	Circle graph
	Circle graph?
	Circle graphs
13	Sampling
14	No divisibility rules
17	(But 2 step?)
20	(Complex)
	Write equation not expression.
24	Time zones
	No "time" standard
	Time
25	Convert, not compare
	dec -> frac
33	Can make whatever you want.
35	Weak match
43	Do kids know $17 = ht$?
45	Sci. notation is at Grade 6

Table 7.8
DOK Levels and Objectives Coded by Each Reviewer
Grade 7 Mathematics—November 2003
West Virginia

Item	DOK	Pobj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj
1	1	7.1.5		1	7.1.5		1	7.1.5		1	7.1.5	1	7.1.5	1	7.1.5		1	7.1.5	1	7.1.5
2	1	7.1.6		2	7.1.6		1	7.1.6		1	7.1.6	1	7.1.6	1	7.1.6		1	7.1.6	1	7.1.6
3	1	7.1.7		1	7.1.7		1	7.1.7		1	7.1.7	1	7.1.7	1	7.1.7		1	7.1.7	1	7.1.7
4	2	7.1.8		1	7.1.8		2	7.1.8		1	7.1.7	1	7.1.7	2	7.1.8		2	7.1.7	2	7.1.7
5	1	7.1.8		1	7.1.8		1	7.1.8		1	7.1.8	2	7.1.8	2	7.1.8		2	7.1.7	2	7.1.8
6	1	7.1.2		1	7.1.2		1	7.1.2		1	7.1.2	1	7.1.2	1	7.1.2		1	7.2.2	1	7.2.2
7	1	7.5.1		1	7.5.1		1	7.5.1		1	7.5.1	1	7.5.1	2	7.5.1		1	7.5.1	1	7.5.1
8	2	7.2.1		2	7.2.1		2	7.2.1		1	7.2.1	1	7.2.1	2	7.2.1		1	7.2.1	1	7.2.1
9	1	7.5.3		2	7.5.3		1	7.5.3		1	7.5.3	2	7.5.3	2	7.5.3		2	7.5.3	1	7.5.3
10	2	7.5.3		2	7.5.3		2	7.5.3		2	7.5.3	2	7.5.3	2	7.5.3		2	7.5.3	2	7.5.3
11	2	7.3.3		2	7.3.3		2	7.3.3		1	7.3.3	2	7.3.3	3	7.3.3		1	7.3.3	2	7.3.3
12	2	7.5		2	7.5.3		2	7.5		2	7.5.3	1	7.5.3	2	7.5		2	7.5	2	7.5
13	2	7.5.3		2	7.5		2	7.5		2	7.5.3	2	7.5.1	2	7.5.3		1	7.5	2	7.5.3/ 7.5.2
14	1	7.1		1	7.2.4		1	7.1.7		1	7.1.7	1	7.1.5	1	7.1.7		2	7.1.7	1	7.1.5
15	1	7.3.4		2	7.3.4		2	7.3.6		1	7.3.4	2	7.3.3	2	7.3.6		1	7.3.6	2	7.3.6
16	1	7.4.1		2	7.4.1		2	7.4.1		2	7.4.1	2	7.4.1	1	7.4.1		1	7.4.1	1	7.4.1
17	2	7.2.9		2	7.2.9		2	7.2.9		2	7.2.13	2	7.2.9	2	7.2.9	7.2.3	2	7.2.9	2	7.2.9
18	1	7.4.1		1	7.4.1		1	7.4.1		2	7.4.1	2	7.4.1	1	7.4.1		2	7.4.1	1	7.4.1
19	2	7.4.4	7.1.8	1	7.4.4	7.1.7	2	7.4.4	7.1.8	2	7.4.4	2	7.4.4	2	7.4.4	7.1.8	2	7.4.4	2	7.2.6
20	1	7.2.7		2	7.2.7		2	7.2.7		1	7.2.13	1	7.2.7	1	7.2.7		1	7.2.7	1	7.2.9

Table 7.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 7 Mathematics—November 2003
West Virginia

Item	DOK	PObj	SObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	SObj	DOK	PObj
21	2	7.2.1	7.4.4	1	7.1.7	2	7.2.1	2	7.2.6	1	7.2.6	2	7.2.1	2	7.2	7.1.7	2	7.2.1
22	2	7.1.7		2	7.1.7	2	7.3.7	1	7.1.5	2	7.2.6	2	7.1.7	2	7.1.7		2	7.2.6
23	1	7.1.6		1	7.1.6	2	7.1.6	2	7.2.13	1	7.1.6	1	7.1.6	1	7.1.6		1	7.1.6
24	2	7.1.7		2	7.1.7	2	7.4	2	7.4.4	2	7.4	3	7.4	2	7.4.4		2	7.4
25	1	7.1.4		1	7.1.4	1	7.1.4	1	7.1.4	1	7.1.4	1	7.1.4	1	7.1.4		1	7.1.4
26	1	7.5.1		1	7.5.1	2	7.5.1	1	7.5.1	1	7.5.1	1	7.5.1	1	7.5.1		1	7.5.1
27	1	7.3.2		1	7.3.2	1	7.3.2	1	7.3.2	1	7.3.2	1	7.3.2	1	7.3.2		1	7.3.2
28	2	7.2.6		2	7.2.6	2	7.3.7	2	7.2.6	1	7.2.6	2	7.2.6	2	7.2.6		2	7.2.6
29	1	7.1.7		1	7.4.1	2	7.4.1	2	7.4.1	2	7.4.1	2	7.4.1	1	7.4.1		1	7.4.1
30	1	7.1.7		1	7.4.1	2	7.4.1	1	7.4.2	1	7.4.2	2	7.4	2	7.4.1		2	7.4.2
31	2	7.1.7	7.3.7	2	7.3.7	2	7.4.1	2	7.3.7	2	7.3.7	3	7.3.7	2	7.1.7		2	7.3.7
32	1	7.3.7		1	7.3.7	2	7.3.7	1	7.3.7	1	7.3.7	2	7.3.7	1	7.3.7		2	7.3.7
33	1	7.3.3		2	7.3.3	1	7.3.3	1	7.3.3	2	7.3.3	2	7.3.3	2	7.3.3		2	7.3.3
34	1	7.2.9		1	7.2.9	1	7.1.5	1	7.2.9	1	7.2.9	1	7.2.9	1	7.2.2		1	7.2.9
35	1	7.5.2		2	7.5.2	2	7.5.2	1	7.5.2	1	7.5.2	2	7.5.2	1	7.5.2		2	7.5.2
36	1	7.4.4		1	7.4.4	2	7.4.1	2	7.4.4	1	7.4.4	1	7.1.7	1	7.4.4		2	7.4.4
37	1	7.5.1		1	7.5.1	1	7.5.1	1	7.5.1	1	7.5.1	1	7.5.1	2	7.5		2	7.5.1
38	1	7.2.2		1	7.2.2	1	7.2.2	1	7.2.2	1	7.2.2	1	7.2.2	1	7.2.2		1	7.2.2
39	1	7.2.4		2	7.2.4	2	7.2.4	2	7.2.4	1	7.2.4	2	7.2.4	2	7.2.4		1	7.2.4
40	1	7.2.10		1	7.1.1	2	7.2.10	2	7.2.10	1	7.2.10	2	7.2.10	2	7.2.10		2	7.2.10

Table 7.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 7 Mathematics—November 2003
West Virginia

Item	DOK	PObj	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj		DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj
41	1	7.2.3	3	7.3.6	1	7.2.3		1	7.1.2		1	7.2.3	1	7.2.3		2	7.2.3		1	7.2.3	
42	2	7.3.6	1	7.2.9	2	7.3.6		1	7.3.5		2	7.3.6	2	7.3.6		2	7.3.6		2	7.3.6	
43	1	7.2.9	2	7.4.1	1	7.2.9		2	7.2.13		1	7.2.9	1	7.2.9		2	7.2.2		1	7.2.9	
44	1	7.2.9	2	7.5.3	1	7.4.2		2	7.4.1		1	7.4.2	1	7.4.2		2	7.4.1		2	7.4.2	
45	1	7.5.3	1	7.1	1	7.5.3		2	7.5.3		2	7.5.3	2	7.5.3		2	7.5.3		1	7.5.3	
46	1	7.2.8	1	7.3.2	1	7.2.8		2	7.5.3		1	7.2.8	1	7.2.8		1	7.2.2		1	7.2.8	
47	2	7.3.2	1	7.1.3	1	7.3.2		1	7.3.2		2	7.3.2	2	7.3.2		1	7.3.2		2	7.3.2	
48	1	7.1.3	3	7.5.3	1	7.1.3		1	7.1.3		1	7.2.2	1	7.1.3		1	7.1.5		1	7.1.3	
49	3	7.5.3	2	7.1.7	3	7.2.11	7.2.5/ 7.2.9	3	7.5.3	7.2.11	2	7.2.11	3	7.5.3		2	7.5.2		2	7.2.1	7.2.11
50	2	7.2.13	2	7.1.7	2	7.2.13		3	7.1.7		2	7.1.7	3	7.2.13	7.2.7	3	7.2.13	7.2.7	2	7.2.13	
51	3	7.5.4	3	7.5.4	2	7.5.4		2	7.5.3		3	7.2.9	3	7.5.4		3	7.5.4		3	7.5.4	
52	3	7.4.1	3	7.4.1	2	7.4.1		3	7.4.1		3	7.4.1	3	7.4.3	7.4.1	3	7.4.1		2	7.4.1	

Table 7.9
 Objectives Coded to Each Item by Reviewers
 West Virginia Grade 7 Mathematics--November 2003

	Low				Medium				High				
	8				8.307693				12				
1:	7.1.5	7.1.5	7.1.5	7.1.5	7.1.5	7.1.5	7.1.5	7.1.5	7.1.5				
2:	7.1.6	7.1.6	7.1.6	7.1.6	7.1.6	7.1.6	7.1.6	7.1.6	7.1.6				
3:	7.1.7	7.1.7	7.1.7	7.1.7	7.1.7	7.1.7	7.1.7	7.1.7	7.1.7				
4:	7.1.7	7.1.7	7.1.7	7.1.7	7.1.8	7.1.8	7.1.8	7.1.8	7.1.8				
5:	7.1.7	7.1.8	7.1.8	7.1.8	7.1.8	7.1.8	7.1.8	7.1.8	7.1.8				
6:	7.1.2	7.1.2	7.1.2	7.1.2	7.1.2	7.1.2	7.2.2	7.2.2	7.2.2				
7:	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1				
8:	7.2.1	7.2.1	7.2.1	7.2.1	7.2.1	7.2.1	7.2.1	7.2.1	7.2.1				
9:	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3				
10:	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3				
11:	7.3.3	7.3.3	7.3.3	7.3.3	7.3.3	7.3.3	7.3.3	7.3.3	7.3.3				
12:	7.5	7.5	7.5	7.5	7.5	7.5.3	7.5.3	7.5.3	7.5.3				
13:	7.5	7.5	7.5	7.5.1	7.5.2	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3			
14:	7.1	7.1.5	7.1.5	7.1.7	7.1.7	7.1.7	7.1.7	7.1.7	7.2.4				
15:	7.3.3	7.3.4	7.3.4	7.3.4	7.3.6	7.3.6	7.3.6	7.3.6	7.3.6				
16:	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1				
17:	7.2.3	7.2.9	7.2.9	7.2.9	7.2.9	7.2.9	7.2.9	7.2.9	7.2.9	7.2.13			
18:	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1				
19:	7.1.7	7.1.8	7.1.8	7.1.8	7.2.6	7.4.4	7.4.4	7.4.4	7.4.4	7.4.4	7.4.4	7.4.4	7.4.4
20:	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.9	7.2.13				
21:	7.1.7	7.1.7	7.2	7.2.1	7.2.1	7.2.1	7.2.1	7.2.1	7.2.6	7.2.6	7.4.4		
22:	7.1.5	7.1.7	7.1.7	7.1.7	7.1.7	7.2.6	7.2.6	7.3.7	7.3.7				
23:	7.1.6	7.1.6	7.1.6	7.1.6	7.1.6	7.1.6	7.1.6	7.2.13	7.2.13				
24:	7.1.7	7.1.7	7.4	7.4	7.4	7.4	7.4.4	7.4.4	7.4.4				
25:	7.1.4	7.1.4	7.1.4	7.1.4	7.1.4	7.1.4	7.1.4	7.1.4	7.1.4				
26:	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1				
27:	7.3.2	7.3.2	7.3.2	7.3.2	7.3.2	7.3.2	7.3.2	7.3.2	7.3.2				
28:	7.2.6	7.2.6	7.2.6	7.2.6	7.2.6	7.2.6	7.2.6	7.3.7	7.3.7				
29:	7.1.7	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1				
30:	7.1.7	7.4	7.4.1	7.4.1	7.4.1	7.4.2	7.4.2	7.4.2	7.4.2				
31:	7.1.7	7.1.7	7.3.7	7.3.7	7.3.7	7.3.7	7.3.7	7.3.7	7.3.7	7.4.1			
32:	7.3.7	7.3.7	7.3.7	7.3.7	7.3.7	7.3.7	7.3.7	7.3.7	7.3.7				
33:	7.3.3	7.3.3	7.3.3	7.3.3	7.3.3	7.3.3	7.3.3	7.3.3	7.3.3				
34:	7.1.5	7.2.2	7.2.9	7.2.9	7.2.9	7.2.9	7.2.9	7.2.9	7.2.9				
35:	7.5.2	7.5.2	7.5.2	7.5.2	7.5.2	7.5.2	7.5.2	7.5.2	7.5.2				
36:	7.1.7	7.4.1	7.4.4	7.4.4	7.4.4	7.4.4	7.4.4	7.4.4	7.4.4				

Table 7.9 (continued)
Objectives Coded to Each Item by Reviewers
West Virginia Grade 7 Mathematics--November 2003

37:	7.5	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1	7.5.1				
38:	7.2.2	7.2.2	7.2.2	7.2.2	7.2.2	7.2.2	7.2.2	7.2.2				
39:	7.2.4	7.2.4	7.2.4	7.2.4	7.2.4	7.2.4	7.2.4	7.2.4				
40:	7.1.1	7.2.10	7.2.10	7.2.10	7.2.10	7.2.10	7.2.10	7.2.10				
41:	7.1.2	7.2.3	7.2.3	7.2.3	7.2.3	7.2.3	7.2.3	7.3.6				
42:	7.2.9	7.3.5	7.3.6	7.3.6	7.3.6	7.3.6	7.3.6	7.3.6				
43:	7.2.2	7.2.9	7.2.9	7.2.9	7.2.9	7.2.9	7.2.13	7.4.1				
44:	7.2.9	7.4.1	7.4.1	7.4.2	7.4.2	7.4.2	7.4.2	7.5.3				
45:	7.1	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3	7.5.3				
46:	7.2.2	7.2.8	7.2.8	7.2.8	7.2.8	7.2.8	7.3.2	7.5.3				
47:	7.1.3	7.3.2	7.3.2	7.3.2	7.3.2	7.3.2	7.3.2	7.3.2				
48:	7.1.3	7.1.3	7.1.3	7.1.3	7.1.3	7.1.5	7.2.2	7.5.3				
49:	7.1.7	7.2.1	7.2.5	7.2.9	7.2.11	7.2.11	7.2.11	7.2.11	7.5.2	7.5.3	7.5.3	7.5.3
50:	7.1.7	7.1.7	7.1.7	7.2.7	7.2.7	7.2.13	7.2.13	7.2.13	7.2.13	7.2.13		
51:	7.2.9	7.5.3	7.5.4	7.5.4	7.5.4	7.5.4	7.5.4	7.5.4				
52:	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.1	7.4.3			

Table 7.10
 Items Coded by Reviewers to Each Objective
 West Virginia Grade 7 Mathematics--November 2003

Low		Medium		High
0		10.28571		39
root:				
7.1:	14 45			
7.1.1:	40			
7.1.2:	6 6 6 6 6 6 41			
7.1.3:	47 48 48 48 48 48			
7.1.4:	25 25 25 25 25 25 25 25			
7.1.5:	1 1 1 1 1 1 1 1 14 14 22 34 48			
7.1.6:	2 2 2 2 2 2 2 2 23 23 23 23 23 23 23			
7.1.7:	3 3 3 3 3 3 3 3 4 4 4 4 5 14 14 14 14 19 21 21 22 22 22 22 24 24 29 30 31 31 36			
	49 50 50 50			
7.1.8:	4 4 4 4 5 5 5 5 5 5 5 19 19 19			
7.2:	21			
7.2.1:	8 8 8 8 8 8 8 8 21 21 21 21 49			
7.2.2:	6 6 34 38 38 38 38 38 38 38 38 43 46 48			
7.2.3:	17 41 41 41 41 41 41			
7.2.4:	14 39 39 39 39 39 39 39 39			
7.2.5:	49			
7.2.6:	19 21 21 22 22 28 28 28 28 28 28 28			
7.2.7:	20 20 20 20 20 20 50 50			
7.2.8:	46 46 46 46 46			
7.2.9:	17 17 17 17 17 17 17 20 34 34 34 34 34 34 42 43 43 43 43 43 44 49 51			
7.2.10:	40 40 40 40 40 40 40			
7.2.11:	49 49 49 49			
7.2.12:				
7.2.13:	17 20 23 43 50 50 50 50 50			
7.3:				
7.3.1:				
7.3.2:	27 27 27 27 27 27 27 27 46 47 47 47 47 47 47 47			
7.3.3:	11 11 11 11 11 11 11 11 15 33 33 33 33 33 33 33 33			
7.3.4:	15 15 15			
7.3.5:	42			
7.3.6:	15 15 15 15 41 42 42 42 42 42 42			
7.3.7:	22 28 31 31 31 31 31 31 32 32 32 32 32 32 32			
7.4:	24 24 24 24 30			
7.4.1:	16 16 16 16 16 16 16 16 18 18 18 18 18 18 18 18 29 29 29 29 29 29 29 29 30 30 30 31 36 43 44 44			
	52 52 52 52 52 52 52 52			

Table 7.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
 West Virginia Grade 7 Mathematics--November 2003

One Reviewer		50 % of Reviewers		All Reviewers										
1		4		8										
root:														
7.1:	14:1	45:1												
7.1.1:	40:1													
7.1.2:	6:6	41:1												
7.1.3:	47:1	48:5												
7.1.4:	25:8													
7.1.5:	1:8	14:2	22:1	34:1	48:1									
7.1.6:	2:8	23:7												
7.1.7:	3:8	4:4	5:1	14:4	19:1	21:2	22:4	24:2	29:1	30:1	31:2	36:1	49:1	50:3
7.1.8:	4:4	5:7	19:3											
7.2:	21:1													
7.2.1:	8:8	21:4	49:1											
7.2.2:	6:2	34:1	38:8	43:1	46:1	48:1								
7.2.3:	17:1	41:6												
7.2.4:	14:1	39:8												
7.2.5:	49:1													
7.2.6:	19:1	21:2	22:2	28:7										
7.2.7:	20:6	50:2												
7.2.8:	46:5													
7.2.9:	17:7	20:1	34:6	42:1	43:5	44:1	49:1	51:1						
7.2.10:	40:7													
7.2.11:	49:4													
7.2.12:														
7.2.13:	17:1	20:1	23:1	43:1	50:5									
7.3:														
7.3.1:														
7.3.2:	27:8	46:1	47:7											
7.3.3:	11:8	15:1	33:8											
7.3.4:	15:3													
7.3.5:	42:1													
7.3.6:	15:4	41:1	42:6											
7.3.7:	22:1	28:1	31:6	32:8										

Table 8.1

Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers

West Virginia Grade 8 Mathematics—November 2003

Number of Assessment Items—52

Standards			Level by Objective			Hits		Cat. Concurr.
Title	Goals #	Objs #	Level	# of objs by Level	% w/in std by Level	Mean	S.D.	
8.1 - Num/Oper	7	7	1 2	1 6	14 85	10.25	1.09	YES
8.2 – Algebra	10	10.12	1 2 3	2 6 2	20 60 20	16.62	2.64	YES
8.3 - Geometry	6	6	2	6	100	9.75	0.43	YES
8.4 - Measurement	4	4	1 2 3	1 1 2	25 25 50	7.5	0.5	YES
8.5 - Data Analy/Prob	5	5	2 3	1 4	20 80	11.38	0.70	YES
Total	32	32.12	1 2 3	4 20 8	12 62 25	55.5	2	

Table 8.2
Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 8 Mathematics—November 2003
Number of Assessment Items—52

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.	
8.1 - Num/Oper	7	7	10.25	1.09	60	40	39	40	1	5	WEAK
8.2 - Algebra	10	10.12	16.62	2.64	43	44	40	40	17	33	YES
8.3 - Geometry	6	6	9.75	0.43	49	47	44	44	7	12	YES
8.4 - Measurement	4	4	7.5	0.5	59	45	36	43	5	20	WEAK
8.5 - Data Analy/Prob	5	5	11.38	0.70	83	30	17	30	0	0	NO
Total	32	32.12	55.5	2	56	44	36	41	8	23	

Table 8.3

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

West Virginia Grade 8 Mathematics—November 2003

Number of Assessment Items—52

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.	
8.1 - Num/Oper	7	7	10.25	1.09	4.75	0.43	68	6	YES	18	2	0.76	0.03	YES
8.2 - Algebra	10	10.12	16.62	2.64	9.12	0.78	90	7	YES	30	4	0.82	0.03	YES
8.3 - Geometry	6	6	9.75	0.43	4.38	0.48	73	8	YES	18	1	0.77	0.05	YES
8.4 - Measurement	4	4	7.5	0.5	3.5	0.5	88	12	YES	14	1	0.64	0.04	WEAK
8.5 - Data Analy/Prob	5	5	11.38	0.70	4.25	0.66	85	13	YES	21	1	0.73	0.04	YES
Total	32	32.12	55.5	2	5.2	2.09	81	13		20	6	0.74	0.07	

Table 8.4

*Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers*

West Virginia Grade 8 Mathematics—November 2003

Number of Assessment Items—52

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of- Knowledge Consistency	Range of Knowledge	Balance of Representation
8.1 - Num/Oper	YES	WEAK	YES	YES
8.2 - Algebra	YES	YES	YES	YES
8.3 - Geometry	YES	YES	YES	YES
8.4 - Measurement	YES	WEAK	YES	WEAK
8.5 - Data Analy/Prob	YES	NO	YES	YES

Table 8.5
Source-of-Challenge Issues by Reviewer
West Virginia Grade 8 Mathematics—November 2003

Item Number	Comments by Reviewer
6	Wording. What fraction of capacity do people in cabin represent.
18	Item states "one of four"
21	How do we know the faces are square?
	Lid? Shape issue
	Vicky story not needed. Are they square?
22	Squares?
25	#25-26: "flow rate" is not defined
31	Isn't B also true, ...correct

Table 8.6 (Continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 8 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
22	2	1	1	1	2	1	1	1
23	3	2	2	2	2	2	2	2
24	2	2	2	2	2	2	2	2
25	2	2	2	1	1	2	2	2
26	1	1	1	1	1	1	1	1
27	2	2	2	2	2	2	2	2
28	2	1	1	2	2	2	2	2
29	2	2	2	2	1	2	1	2
30	2	2	2	2	2	2	2	2
31	2	2	2	2	2	2	2	1
32	1	2	2	2	2	2	1	2
33	2	2	2	1	1	2	2	2
34	1	1	2	1	2	1	2	1
35	1	1	2	2	1	2	2	1
36	1	1	1	2	2	1	1	1
37	1	2	2	2	2	2	2	1
38	2	1	2	2	2	2	2	2
39	1	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1	1
41	1	1	2	2	1	2	2	1

Table 8.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 8 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	3	3	2	3	3	3	3	3
43	1	2	1	2	1	2	1	1
44	2	2	2	2	1	2	2	2
45	1	1	2	1	2	1	2	1
46	1	1	1	1	1	1	1	1
47	2	1	2	1	2	1	2	2
48	1	1	2	1	2	2	2	1
49	3	2	3	3	3	3	3	2
50	3	3	3	3	3	3	3	3
51	3	3	3	3	3	3	3	3
52	3	2	3	3	3	3	3	3
Intraclass Corr Grade 8 Mathematics					0.942			

Table 8.7
Notes by Reviewer
West Virginia Grade 8 Mathematics—November 2003

Item Number	Comments by Reviewer
6	Lower grade objective.
	Bad wording
	Cabin/blimp
8	X2 pattern
9	11 lines/lower grade
	Not good match
12	"Appear" is a relative term
13	"Most likely?" – either it is or it isn't! Weak Match.
	Estimate
	Lower grade objective.
14	Bar graphs are rok(?) at 8
15	Bar graphs are rok(?) at 8
19	Sum of <'s in (triangle) not listed used create expression
23	All the water?
26	#26-27: discrete data not continuous
29	Reviewer put ? after secondary objective.
38	Doesn't he already have $\frac{1}{3}$ without depositing it?
44	"Easy 2"

Table 8.8
DOK and Objectives Coded by Each Reviewer
Grade 8 Mathematics—November 2003
West Virginia

Item	DOK	PObj	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj	S1Obj
1	1	8.2.1	1	8.1.4	1	8.1.4		1	8.1.4		1	8.2.1		1	8.1.4		1	8.1.4	1	8.2.1	
2	1	8.1.7	1	8.1.6	1	8.1.6		1	8.1.6		1	8.1.6		1	8.1.6		1	8.1.6	1	8.1.6	
3	1	8.2.1	1	8.2.1	1	8.2.1		1	8.2.1		1	8.2.1		1	8.2.1		1	8.2.1	1	8.2.1	
4	2	8.1.5	1	8.1.5	2	8.1.5		1	8.1.5		1	8.1.5		2	8.1.5		2	8.1.5	2	8.1.5	
5	1	8.1.5	1	8.1.5	1	8.1.5		1	8.1.5		1	8.1.5		2	8.1.5		2	8.1.5	1	8.1.5	
6	1	8.1.6	1	8.1.6	1	8.1.6		1	8.1.6		1	8.1.6		2	8.1.6		1	8.1.6	1	8.1.6	
7	2	8.1.6	1	8.1.6	1	8.1.6		1	8.1.5		1	8.1.5		1	8.1.6		1	8.2.10	2	8.2.2	8.2.10
8	2	8.2.8	2	8.2.8	1	8.2.8		1	8.2.8		2	8.2.8		2	8.2.8		1	8.2	2	8.2.8	
9	1	8.3.2	1	8.3.2	1	8.3.2		1	8.3.2		1	8.3.2		1	8.3.2		1	8.3.2	1	8.3.2	
10	1	8.1.3	1	8.1.3	1	8.1.3		1	8.1.3		1	8.1.3		1	8.1.3		1	8.1.3	1	8.1.3	
11	1	8.1.1	2	8.1.1	2	8.1.1		1	8.1.1		1	8.1.1		2	8.1.1		1	8.1.1	1	8.1.1	
12	2	8.5.5	2	8.5.5	2	8.5.5		1	8.5.5		1	8.5.3		2	8.5.5		2	8.5.5	2	8.5.5	
13	1	8.1.5	1	8.1.1	1	8.1.1		1	8.1.1		1	8.1.1	8.1.5	1	8.1.1	8.1.5	2	8.1.5	1	8.1.1	8.1.5
14	1	8.5.3	2	8.5.3	1	8.5.3		1	8.5.5		1	8.5.3		1	8.5.3		1	8.5.3	1	8.5.3	
15	2	8.5.3	2	8.5.3	1	8.5.3		1	8.5.5		2	8.5.3		2	8.5.3		1	8.5.3	2	8.5.3	
16	2	8.5.3	2	8.5.3	2	8.5.5		2	8.5.5		2	8.5.3		2	8.5.3		1	8.5.3	2	8.5.5	
17	2	8.3.6	2	8.3.6	2	8.3.6		1	8.2.3	8.1.5	2	8.3.6		2	8.1.5		2	8.3.6	2	8.2.3	
18	1	8.5.4	1	8.5.2	1	8.5.4		1	8.5.2		1	8.5.2		1	8.5.2		2	8.5.4	1	8.5.2	
19	1	8.2.5	2	8.2.5	1	8.2.5	8.4.3	1	8.2.5	8.4.3	1	8.2.5	8.4.3	2	8.4.3	8.2.5	1	8.4.3	2	8.2.5	
20	1	8.2.2	1	8.2.2	1	8.2.2		1	8.2.2		1	8.2.2	8.2.2	1	8.2.2		1	8.2.2	1	8.2.2	

Table 8.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 8 Mathematics—November 2003
West Virginia

Item	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj
21	1	8.3.2	1	8.3.2	1	8.3.2	1	8.3.2	1	8.3.2	1	8.3.2		1	8.3.2		1	8.3.2	
22	2	8.4.1	1	8.4.1	1	8.4.1	1	8.4.1	2	8.4.1	1	8.4.1		1	8.4.1		1	8.4.1	
23	3	8.4.1	2	8.4.1	2	8.4.1	2	8.4.1	2	8.4.1	2	8.4.1		2	8.4.1		2	8.4.1	
24	2	8.3.5	2	8.3.5	2	8.3.5	2	8.3.5	2	8.3.4	2	8.3.4		2	8.2.7		2	8.3.5	
25	2	8.2.8	2	8.2.8	2	8.2.8	1	8.2.8	1	8.2.8	2	8.2.8		2	8.2.8		2	8.2.3	
26	1	8.5.3	1	8.5.3	1	8.5.3	1	8.5.5	1	8.5.3	1	8.5.3		1	8.5.3		1	8.5.3	
27	2	8.5.3	2	8.5.3	2	8.5.5	2	8.5.5	2	8.5.3	2	8.5.3	8.5.5	2	8.5.3		2	8.5.3	
28	2	8.4.1	1	8.4.1	1	8.4.1	2	8.4.1	2	8.4.1	2	8.4.1		2	8.4.1		2	8.4.1	
29	2	8.5.2	2	8.5.2	2	8.5.2	2	8.5.2	1	8.5.2	2	8.5.4	8.5.2	1	8.5.4		2	8.5.2	
30	2	8.3.6	2	8.3.6	2	8.3.6	2	8.3.6	2	8.3.6	2	8.3.6		2	8.3.6		2	8.3.6	
31	2	8.4.1	2	8.4.1	2	8.4.1	2	8.4.1	2	8.4.1	2	8.4.1		2	8.4.2		1	8.4.1	
32	1	8.2.5	2	8.2.5	2	8.2.5	2	8.2.10	2	8.2.5	2	8.2.6		1	8.2.2		2	8.2.5	8.2.10
33	2	8.3.6	2	8.3.6	2	8.3.6	1	8.3.6	1	8.3.6	2	8.3.6		2	8.3.6		2	8.3.6	
34	1	8.2.2	1	8.2.2	2	8.2.2	1	8.2.5	2	8.2.2	1	8.2.2		2	8.2.2		1	8.2.2	
35	1	8.5.1	1	8.5.1	2	8.5.1	2	8.5.1	1	8.5.1	2	8.5.1		2	8.5.1		1	8.5.1	
36	1	8.4.2	1	8.4.2	1	8.4.2	2	8.4.1	2	8.4.2	1	8.4.2		1	8.4.2		1	8.4.2	
37	1	8.3.5	2	8.3.4	2	8.3.5	2	8.3.4	2	8.3.4	2	8.3.4	8.3.5	2	8.3.4		1	8.3.5	
38	2	8.1.6	1	8.1.6	2	8.1.6	2	8.2.3	2	8.1.6	2	8.1.6		2	8.1.6	8.2.10	2	8.2.10	8.1.6
39	1	8.2.9	1	8.2.9	1	8.2.9	1	8.2.9	1	8.2.9	1	8.2.9		1	8.2.9		1	8.2.9	
40	1	8.3.2	1	8.3.2	1	8.3.2	1	8.3.2	1	8.3.2	1	8.3.2		1	8.3.2		1	8.3.2	

Table 8.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 8 Mathematics—November 2003
West Virginia

Item	DOK	PObj	Sobj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj
41	1	8.2.9		1	8.2.9		2	8.2.9		2	8.2.9		1	8.2.9		2	8.2.9		2	8.2.9		1	8.2.9	
42	3	8.4.1		3	8.4.1	8.1.6	2	8.4.1	8.1.6	3	8.3.2		3	8.4.1	8.1.6	3	8.4.1		3	8.4.1		3	8.4.1	
43	1	8.5.1		2	8.5.1		1	8.5.1		2	8.5.1		1	8.5.1		2	8.5.1		1	8.5.1		1	8.5.1	
44	2	8.2.6		2	8.2.6		2	8.2.6		2	8.2.6		1	8.2.6		2	8.2.6		2	8.2.6		2	8.2.6	
45	1	8.4.4		1	8.4.4		2	8.4.4		1	8.4.4		2	8.4.4		1	8.4.4		2	8.4.4		1	8.4.4	
46	1	8.3.3		1	8.3.3		1	8.3.3		1	8.3.3		1	8.3.3		1	8.3.3		1	8.3.3		1	8.3.3	
47	2	8.2.3		1	8.2.3		2	8.2.3		1	8.2.3		2	8.2.3		1	8.2.3		2	8.2.3		2	8.2.3	
48	1	8.2.1		1	8.2.4		2	8.2.4		1	8.2.1		2	8.2.1		2	8.2.4		2	8.2.1		1	8.2.4	
49	3	8.2.8		2	8.2.8		3	8.2.10		3	8.2.6		3	8.2.10		3	8.2.8	8.2.6	3	8.2.8	8.2.6	2	8.2.6	8.2.8
50	3	8.5.3		3	8.5.3		3	8.5.3		3	8.5.3		3	8.5.3		3	8.5.3		3	8.5.3		3	8.5.3	
51	3	8.3.6		3	8.3.6		3	8.3.6		3	8.3.6		3	8.3.6		3	8.3.6		3	8.3.6		3	8.2.3	8.3.5
52	3	8.2.5	8.2.7	2	8.2.7		3	8.2.7	8.2.5	3	8.5.3	8.2.6	3	8.2.7		3	8.2.7		3	8.2.5	8.2.7	3	8.2.7	8.2.10

Table 8.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 8 Mathematics--November 2003

	Low				Medium				High				
	8				8.538462				13				
1:	8.1.4	8.1.4	8.1.4	8.1.4	8.1.4	8.1.4	8.2.1	8.2.1	8.2.1				
2:	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6	8.1.7				
3:	8.2.1	8.2.1	8.2.1	8.2.1	8.2.1	8.2.1	8.2.1	8.2.1	8.2.1				
4:	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5				
5:	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5				
6:	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6				
7:	8.1.5	8.1.5	8.1.6	8.1.6	8.1.6	8.1.6	8.2.2	8.2.10	8.2.10				
8:	8.2	8.2.8	8.2.8	8.2.8	8.2.8	8.2.8	8.2.8	8.2.8	8.2.8				
9:	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2				
10:	8.1.3	8.1.3	8.1.3	8.1.3	8.1.3	8.1.3	8.1.3	8.1.3	8.1.3				
11:	8.1.1	8.1.1	8.1.1	8.1.1	8.1.1	8.1.1	8.1.1	8.1.1	8.1.1				
12:	8.5.3	8.5.5	8.5.5	8.5.5	8.5.5	8.5.5	8.5.5	8.5.5	8.5.5				
13:	8.1.1	8.1.1	8.1.1	8.1.1	8.1.1	8.1.1	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5	8.1.5	
14:	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.5				
15:	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.5				
16:	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.5	8.5.5	8.5.5				
17:	8.1.5	8.1.5	8.2.3	8.2.3	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6			
18:	8.5.2	8.5.2	8.5.2	8.5.2	8.5.2	8.5.4	8.5.4	8.5.4	8.5.4				
19:	8.2.5	8.2.5	8.2.5	8.2.5	8.2.5	8.2.5	8.2.5	8.2.5	8.4.3	8.4.3	8.4.3	8.4.3	8.4.3
20:	8.2.2	8.2.2	8.2.2	8.2.2	8.2.2	8.2.2	8.2.2	8.2.2	8.2.2	8.2.2			
21:	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2				
22:	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1				
23:	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1				
24:	8.2.7	8.3.4	8.3.4	8.3.5	8.3.5	8.3.5	8.3.5	8.3.5	8.3.5				
25:	8.2.3	8.2.8	8.2.8	8.2.8	8.2.8	8.2.8	8.2.8	8.2.8	8.2.8				
26:	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.5				
27:	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.5	8.5.5	8.5.5			
28:	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1				
29:	8.5.2	8.5.2	8.5.2	8.5.2	8.5.2	8.5.2	8.5.2	8.5.2	8.5.4	8.5.4			
30:	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6				
31:	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.2				
32:	8.2.2	8.2.5	8.2.5	8.2.5	8.2.5	8.2.5	8.2.6	8.2.10	8.2.10	8.2.10			
33:	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6				
34:	8.2.2	8.2.2	8.2.2	8.2.2	8.2.2	8.2.2	8.2.2	8.2.2	8.2.5				
35:	8.5.1	8.5.1	8.5.1	8.5.1	8.5.1	8.5.1	8.5.1	8.5.1	8.5.1				
36:	8.4.1	8.4.2	8.4.2	8.4.2	8.4.2	8.4.2	8.4.2	8.4.2	8.4.2				

Table 8.9 (continued)
Objectives Coded to Each Item by Reviewers
West Virginia Grade 8 Mathematics--November 2003

37:	8.3.4	8.3.4	8.3.4	8.3.4	8.3.4	8.3.5	8.3.5	8.3.5	8.3.5										
38:	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6	8.1.6	8.2.3	8.2.10	8.2.10									
39:	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9											
40:	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2	8.3.2											
41:	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9											
42:	8.1.6	8.1.6	8.1.6	8.3.2	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1	8.4.1								
43:	8.5.1	8.5.1	8.5.1	8.5.1	8.5.1	8.5.1	8.5.1	8.5.1											
44:	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6											
45:	8.4.4	8.4.4	8.4.4	8.4.4	8.4.4	8.4.4	8.4.4	8.4.4											
46:	8.3.3	8.3.3	8.3.3	8.3.3	8.3.3	8.3.3	8.3.3	8.3.3											
47:	8.2.3	8.2.3	8.2.3	8.2.3	8.2.3	8.2.3	8.2.3	8.2.3											
48:	8.2.1	8.2.1	8.2.1	8.2.1	8.2.4	8.2.4	8.2.4	8.2.4											
49:	8.2.6	8.2.6	8.2.6	8.2.6	8.2.8	8.2.8	8.2.8	8.2.8	8.2.8	8.2.10	8.2.10								
50:	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3	8.5.3											
51:	8.2.3	8.3.5	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6	8.3.6										
52:	8.2.5	8.2.5	8.2.5	8.2.6	8.2.7	8.2.7	8.2.7	8.2.7	8.2.7	8.2.7	8.2.7	8.2.10	8.5.3						

Table 8.10 (continued)
 Items Coded by Reviewers to Each Objective
 West Virginia Grade 8 Mathematics--November 2003

8.5:	
8.5.1:	35 35 35 35 35 35 35 35 43 43 43 43 43 43 43 43
8.5.2:	18 18 18 18 18 29 29 29 29 29 29 29
8.5.3:	12 14 14 14 14 14 14 14 15 15 15 15 15 15 15 16 16 16 16 16 26 26 26 26 26 26 26 27 27 27 27 50 50 52
8.5.4:	18 18 18 29 29
8.5.5:	12 12 12 12 12 12 12 14 15 16 16 16 26 27 27 27

Table 8.11

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
 West Virginia Grade 8 Mathematics--November 2003

One Reviewer		50 % of Reviewers		All Reviewers		
1		4		8		
root:						
8.1:						
8.1.1:	11:8	13:6				
8.1.2:						
8.1.3:	10:8					
8.1.4:	1:5					
8.1.5:	4:8	5:8	7:2	13:5	17:2	
8.1.6:	2:7	6:8	7:4	38:7	42:3	
8.1.7:	2:1					
8.2:	8:1					
8.2.1:	1:3	3:8	48:4			
8.2.2:	7:1	20:9	32:1	34:7		
8.2.3:	17:2	25:1	38:1	47:8	51:1	
8.2.4:	48:4					
8.2.5:	19:7	32:5	34:1	52:3		
8.2.6:	32:1	44:8	49:4	52:1		
8.2.7:	24:1	52:7				
8.2.8:	8:7	25:7	49:5			
8.2.9:	39:8	41:8				
8.2.10:	7:2	32:2	38:2	49:2	52:1	
8.3:						
8.3.1:						
8.3.2:	9:8	21:8	40:8	42:1		
8.3.3:	46:8					
8.3.4:	24:2	37:5				
8.3.5:	24:5	37:4	51:1			
8.3.6:	17:5	30:8	33:8	51:7		
8.4:						
8.4.1:	22:8	23:8	28:8	31:7	36:1	42:7
8.4.2:	31:1	36:7				
8.4.3:	19:5					
8.4.4:	45:8					

Table 8.11 (continued)

Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 8 Mathematics--November 2003

8.5:								
8.5.1:	35:8	43:8						
8.5.2:	18:5	29:7						
8.5.3:	12:1	14:7	15:7	16:5	26:7	27:6	50:8	52:1
8.5.4:	18:3	29:2						
8.5.5:	12:7	14:1	15:1	16:3	26:1	27:3		

Table 10.1

Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers

West Virginia Grade 10 Mathematics—November 2003

Number of Assessment Items – 49

Standards			Level by Objective			Hits		Cat. Concurr.
Title	Goals #	Objs #	Level	# of objs by Level	% w/in std by Level	Mean	S.D.	
10.1 - Num/Oper	3	3.12	2 3	2 1	66 33	9.5	1.12	YES
10.2 - Algebra	9	10	2 3	7 2	77 22	17.88	1.17	YES
10.3 - Geometry	5	5	1 2	1 4	20 80	9.88	0.93	YES
10.4 - Measurement	4	4.75	1 2 3	1 2 1	25 50 25	8.5	1.32	YES
10.5 - Data Anal/Prob	4	4	2 3	2 2	50 50	6.75	0.66	YES
Total	25	26.88	1 2 3	2 17 6	8 68 24	52.5	2.06	

Table 10.2
Depth-of-Knowledge Consistency Between Standards as Assessment as Rated by Eight Reviewers
West Virginia Grade 10 Mathematics—November 2003
Number of Assessment Items – 49

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.	
Title	Goals #	Objs #	M	S.D.	M	S.D.	M	S.D.	M	S.D.	
10.1 - Num/Oper	3	3.12	9.5	1.12	79	41	21	41	0	0	NO
10.2 - Algebra	9	10	17.88	1.17	59	40	41	40	1	4	WEAK
10.3 - Geometry	5	5	9.88	0.93	47	39	53	39	0	0	YES
10.4 - Measurement	4	4.75	8.5	1.32	64	42	36	42	0	0	NO
10.5 - Data Anal/Prob	4	4	6.75	0.66	71	44	8	27	21	40	NO
Total	25	26.88	52.5	2.06	62	42	34	41	3	17	

Table 10.3

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

West Virginia Grade 10 Mathematics—November 2003

Number of Assessment Items – 49

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.	
10.1 - Num/Oper	3	3.12	9.5	1.12	3	0	97	8	YES	18	2	0.58	0.05	NO
10.2 - Algebra	9	10	17.88	1.17	7.62	0.48	76	5	YES	34	2	0.78	0.05	YES
10.3 - Geometry	5	5	9.88	0.93	4	0	80	0	YES	19	2	0.85	0.04	YES
10.4 - Measurement	4	4.75	8.5	1.32	3.5	0.5	74	8	YES	16	3	0.75	0.10	YES
10.5 - Data Anal/Prob	4	4	6.75	0.66	3.25	0.43	81	11	YES	13	1	0.79	0.03	YES
Total	25	26.88	52.5	2.06	4.28	1.75	82	11		20	8	0.75	0.11	

Table 10.4

*Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers*

West Virginia Grade 10 Mathematics—November 2003

Number of Assessment Items – 49

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of- Knowledge Consistency	Range of Knowledge	Balance of Representation
10.1 - Num/Oper	YES	NO	YES	NO
10.2 - Algebra	YES	WEAK	YES	YES
10.3 - Geometry	YES	YES	YES	YES
10.4 - Measurement	YES	NO	YES	YES
10.5 - Data Anal/Prob	YES	NO	YES	YES

Table 10.5
Source-of-Challenge Issues by Reviewer
West Virginia Grade 10 Mathematics—November 2003

Item Number	Comments by Reviewer
11	Who defines "best"?
16	Was the top flat?
24	Bias. Do all kids know what bowling scores are possible?
34	#33-34: This looks like 1.4x. Confusing format.
	Bullet 2nd part of stem. 1.4x?

Table 10.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 10 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	2	1
3	1	1	1	1	1	1	2	1
4	1	1	1	1	1	1	1	2
5	2	1	2	1	1	2	2	2
6	1	1	1	1	1	1	2	2
7	1	2	1	2	1	1	1	1
8	1	1	2	2	2	2	1	2
9	1	2	2	2	1	2	1	1
10	1	1	1	1	1	1	1	1
11	1	2	1	1	1	2	1	1
12	2	1	2	2	2	2	2	1
13	1	1	1	1	1	2	1	1
14	1	1	1	1	1	1	1	1
15	1	2	2	1	1	1	2	2
16	1	1	1	1	1	1	2	2
17	2	2	2	2	2	2	2	2
18	1	1	2	2	2	1	2	2
19	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1
21	2	1	2	2	1	2	2	2

Table 10.6 (Continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 10 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
22	1	2	2	2	2	2	1	1
23	1	1	2	1	1	2	2	1
24	2	2	2	2	2	2	2	2
25	1	1	1	1	2	1	1	1
26	2	2	2	1	2	2	2	2
27	1	1	1	1	1	1	1	1
28	1	1	2	1	1	1	2	2
29	1	2	2	1	2	2	2	1
30	2	2	2	2	2	2	2	2
31	2	1	2	2	2	2	2	2
32	1	1	1	2	1	1	1	1
33	1	2	2	2	1	1	2	1
34	2	2	2	2	2	2	2	2
35	2	1	2	2	1	2	2	2
36	2	2	2	2	2	2	2	2
37	1	1	1	1	1	1	1	1
38	1	1	1	1	1	1	2	1
39	1	1	2	2	1	1	2	2
40	2	2	2	2	2	2	2	2
41	2	1	2	2	2	2	2	1

Table 10.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 10 Mathematics--November 2003

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	2	1	2	1	2	2	2	2
43	2	2	2	2	2	2	2	2
44	3	2	2	2	3	3	2	2
45	2	2	2	2	1	2	2	2
46	3	3	3	2	3	3	3	2
47	1	1	1	1	1	1	2	1
48	1	1	2	2	2	1	2	1
49	2	2	2	2	2	2	2	2
Intraclass Corr Grade 10 Mathematics					0.900			

Table 10.7
Notes by Reviewer
West Virginia Grade 10 Mathematics—November 2003

Item Number	Comments by Reviewer
4	No specific objective.
	Weak match
	Not a good fit.
8	15% of total or <5
	Multi/routine
9	Exactly?
11	Iffy item
	No time objective.
12	Multistep routine
13	No estimate obj. Only division
21	(Ratio)
25	No specific abs. value
34	Run together looks like 1.4x
	Format issue
	Format!
	Poor format
	Need to bullet items-run on!
36	2 circum (-)

Table 10.7 (continued)

Notes by Reviewer

West Virginia Grade 10 Mathematics—November 2003

Item Number	Comments by Reviewer
47	Salary. Median.
	Salary
	Salary
	Salary
	(Salary)
	Salary
	Salary
48	Expression
	$2x(x-3)+4(x+2)$
	Expression
	Exp.
	Expression
	Expression

Table 10.8
DOK Levels and Objectives Coded by Each Reviewer
Grade 10 Mathematics—November 2003
West Virginia

Item	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj	S1Obj	DO K	PObj	S1Obj
1	1	10.1.1		1	10.1.1	1	10.1.1	1	10.2.4		1	10.1.1		1	10.1.1	1	10.1.1		1	10.1.1	
2	1	10.1.1		1	10.1.1	1	10.1.1	1	10.1.1		1	10.1.1		1	10.1.1	2	10.1.1		1	10.1.1	
3	1	10.2.4		1	10.2.4	1	10.2.9	1	10.2.4		1	10.2.4		1	10.2.4	2	10.2.4		1	10.2.4	
4	1	10.2		1	10.2	1	10.2	1	10.2.4	10.2	1	10.2		1	10.2	1	10.2		2	10.2	
5	2	10.4.2		1	10.1.1	2	10.1.1	1	10.1.1		1	10.1.1		2	10.4.2	2	10.1.1		2	10.1.1	
6	1	10.1.1		1	10.1.1	1	10.1.1	1	10.1.1		1	10.1.1		1	10.1.1	2	10.1.1		2	10.1.1	
7	1	10.5.4		2	10.5.4	1	10.5.4	2	10.5.4		1	10.5.4		1	10.5.4	1	10.5.4		1	10.5.4	
8	1	10.1.1	10.5.4	1	10.1.1	2	10.1.1	2	10.5.4	10.1.1	2	10.5.4	10.1.1	2	10.1.1	1	10.5.4	10.1.1	2	10.1.1	
9	1	10.5.4		2	10.5.4	2	10.5.4	2	10.5.4		1	10.5.4		2	10.5.4	1	10.5.4		1	10.5.4	
10	1	10.5.4	10.5.3	1	10.5.4	1	10.5.4	1	10.5.4		1	10.5.4		1	10.5.4	1	10.5.4	10.5.3	1	10.5.4	10.5.3
11	1	10.4		2	10.4	1	10.4	1	10.4.2	10.1.1	1	10.4		2	10.4.2	1	10.4		1	10.4	
12	2	10.2.3		1	10.1.1	2	10.1.1	2	10.4.2	10.1.1	2	10.1.1		2	10.1.1	2	10.1.1		1	10.1.1	
13	1	10.1		1	10.4	1	10.1.1	1	10.1.1		1	10.1.1		2	10.1.1	1	10.4		1	10.1.1	
14	1	10.3.2		1	10.3.2	1	10.3.2	1	10.3.2		1	10.3.2		1	10.3.2	1	10.3.2		1	10.3.2	
15	1	10.2.1		2	10.2.8	2	10.2.8	1	10.2.8		1	10.2.1		1	10.2.8	2	10.2.1		2	10.2.8	
16	1	10.4.4		1	10.4.4	1	10.4.4	1	10.4.2		1	10.4.4		1	10.4.4	2	10.4.4		2	10.4.2	10.4.4
17	2	10.2.6		2	10.2.6	2	10.2.6	2	10.2.6		2	10.2.6		2	10.2.6	2	10.4.4		2	10.2.1	
18	1	10.3.2		1	10.4.1	2	10.4.1	2	10.3.2		2	10.4.1		1	10.4.1	2	10.3.2		2	10.4.1	
19	1	10.4.4		1	10.1.3	1	10.4.4	1	10.4.1		1	10.4.4		1	10.4.4	1	10.4.4		1	10.1.3	
20	1	10.2.4		1	10.2.4	1	10.2.4	1	10.2.4		1	10.2.4		1	10.2.4	1	10.2.4		1	10.2.4	

Table 10.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 10 Mathematics—November 2003
West Virginia

Item	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj
21	2	10.4.4		1	10.4.4	2	10.4.4	2	10.4.4	10.4.2	1	10.4.4		2	10.4.4		2	10.4.4		2	10.4.4	
22	1	10.2.8		2	10.2.8	2	10.2.8	2	10.2.7		2	10.2.8		2	10.2.7		1	10.2.8		1	10.2.8	
23	1	10.3.2		1	10.3.2	2	10.3.2	1	10.3.2		1	10.3.2		2	10.3.2		2	10.3.2		1	10.3.2	
24	2	10.5.1		2	10.5.1	2	10.5.1	2	10.5.1		2	10.5.1		2	10.5.1		2	10.5.1		2	10.5.1	
25	1	10.1.1		1	10.2.5	1	10.2.5	1	10.2.5	10.1.1	2	10.2.4		1	10.2.5		1	10.2.5	10.1.1	1	10.2.5	10.2.4
26	2	10.2.6		2	10.2.6	2	10.2.6	1	10.2.6		2	10.2.6		2	10.2.6		2	10.2.6		2	10.2.6	
27	1	10.1.3		1	10.1.3	1	10.1.3	1	10.1.3		1	10.1.3		1	10.1.3		1	10.1.3		1	10.1.3	
28	1	10.4.2		1	10.4.2	2	10.4.2	1	10.4.2		1	10.1.1		1	10.4.2		2	10.4.4		2	10.4.2	
29	1	10.2.8		2	10.2.8	2	10.2.8	1	10.2.7		2	10.2.8		2	10.2.7		2	10.2.8		1	10.2.8	
30	2	10.3.3		2	10.3.3	2	10.3.3	2	10.3.3		2	10.3.3		2	10.3.3		2	10.3.3		2	10.3.3	
31	2	10.2.1		1	10.2.2	2	10.2.1	2	10.2.1		2	10.2.1		2	10.2.1		2	10.2.2		2	10.2.1	
32	1	10.3.5		1	10.3.5	1	10.3.5	2	10.3.5		1	10.3.5		1	10.3.5		1	10.3.5		1	10.3.5	
33	1	10.2.5		2	10.2.5	2	10.2.5	2	10.2.5		1	10.2.5		1	10.2.5		2	10.2.5		1	10.2.5	
34	2	10.2.1	10.3.2	2	10.3.2	2	10.3.2	2	10.3.2		2	10.2.1	10.3.2	2	10.3.2		2	10.3.2		2	10.3.2	10.2.1
35	2	10.4.1		1	10.4.1	2	10.4.1	2	10.4.1		1	10.3.4		2	10.4.1		2	10.4.1		2	10.4.1	
36	2	10.3.4		2	10.3.4	2	10.4.4	2	10.3.4		2	10.4.4		2	10.4.4	10.3.4	2	10.3.4	10.4.4	2	10.3.4	
37	1	10.3.4		1	10.3.4	1	10.3.4	1	10.3.4		1	10.3.4		1	10.4.4		1	10.3.4		1	10.3.4	
38	1	10.2.8		1	10.2.8	1	10.2.8	1	10.2.7		1	10.2.8		1	10.2.7		2	10.2.8		1	10.2.8	
39	1	10.3.5		1	10.3.5	2	10.3.5	2	10.3.5		1	10.3.5		1	10.3.5		2	10.3.2		2	10.3.3	
40	2	10.2.1		2	10.2.1	2	10.2.1	2	10.2.1		2	10.2.1		2	10.2.1		2	10.2.1		2	10.2.1	

Table 10.8 (continued)
DOK Levels and Objectives Coded by Each Reviewer
Grade 10 Mathematics—November 2003
West Virginia

Item	DOK	PObj	Sobj	DOK	PObj	DOK	PObj	SObj	DOK	PObj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj	DOK	PObj	SObj
41	2	10.1.1		1	10.1.2	2	10.1.2		2	10.1.2	2	10.1.2		2	10.1.2		2	10.1.2		1	10.1.2	
42	2	10.2.2		1	10.2.2	2	10.2.2		1	10.2.2	2	10.2.2		2	10.2.2		2	10.3.3		2	10.2.2	
43	2	10.2.1		2	10.2.6	2	10.2.1		2	10.2.8	2	10.2.1		2	10.2.8		2	10.2.1		2	10.2.1	
44	3	10.2.6		2	10.2.6	2	10.2.6		2	10.2.6	3	10.2.6		3	10.2.6	10.2.8	2	10.1.2		2	10.2.6	10.2.8
45	2	10.3.3		2	10.3.3	2	10.3.3		2	10.3.3	1	10.1.1		2	10.3.3		2	10.2.2		2	10.1.1	
46	3	10.5.2		3	10.5.3	3	10.5.2		2	10.5.2	3	10.5.2		3	10.5.2		3	10.5.3		2	10.5.2	
47	1	10.5.1		1	10.5.1	1	10.5.1		1	10.5.1	1	10.5.1		1	10.5.1		2	10.2		1	10.5.1	
48	1	10.2.4		1	10.2.4	2	10.2.4		2	10.2.4	2	10.2.4		1	10.2.4		2	10.2.2		1	10.2.9	
49	2	10.3.3	10.4.4	2	10.3.3	2	10.3.3	10.4.4	2	10.3.3	2	10.3.3	10.4.4	2	10.3.3	10.4.4	2	10.4.4	10.3.3	2	10.3.3	10.4.4

Table 10.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 10 Mathematics--November 2003

	Low				Medium				High				
	8				8.571428				14				
1:	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.2.4				
2:	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1				
3:	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.2.9				
4:	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2.4			
5:	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.4.2	10.4.2				
6:	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1				
7:	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4				
8:	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.5.4	10.5.4	10.5.4	10.5.4
9:	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4				
10:	10.5.3	10.5.3	10.5.3	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	10.5.4	
11:	10.1.1	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4.2	10.4.2			
12:	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.2.3	10.4.2			
13:	10.1	10.1.1	10.1.1	10.1.1	10.1.1	10.1.1	10.4	10.4					
14:	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2				
15:	10.2.1	10.2.1	10.2.1	10.2.8	10.2.8	10.2.8	10.2.8	10.2.8	10.2.8				
16:	10.4.2	10.4.2	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4			
17:	10.2.1	10.2.6	10.2.6	10.2.6	10.2.6	10.2.6	10.2.6	10.4.4					
18:	10.3.2	10.3.2	10.3.2	10.4.1	10.4.1	10.4.1	10.4.1	10.4.1	10.4.1				
19:	10.1.3	10.1.3	10.4.1	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4				
20:	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4				
21:	10.4.2	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4			
22:	10.2.7	10.2.7	10.2.8	10.2.8	10.2.8	10.2.8	10.2.8	10.2.8	10.2.8				
23:	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2				
24:	10.5.1	10.5.1	10.5.1	10.5.1	10.5.1	10.5.1	10.5.1	10.5.1	10.5.1				
25:	10.1.1	10.1.1	10.1.1	10.2.4	10.2.4	10.2.5	10.2.5	10.2.5	10.2.5	10.2.5	10.2.5	10.2.5	
26:	10.2.6	10.2.6	10.2.6	10.2.6	10.2.6	10.2.6	10.2.6	10.2.6	10.2.6				
27:	10.1.3	10.1.3	10.1.3	10.1.3	10.1.3	10.1.3	10.1.3	10.1.3	10.1.3				
28:	10.1.1	10.4.2	10.4.2	10.4.2	10.4.2	10.4.2	10.4.2	10.4.2	10.4.4				
29:	10.2.7	10.2.7	10.2.8	10.2.8	10.2.8	10.2.8	10.2.8	10.2.8	10.2.8				
30:	10.3.3	10.3.3	10.3.3	10.3.3	10.3.3	10.3.3	10.3.3	10.3.3	10.3.3				
31:	10.2.1	10.2.1	10.2.1	10.2.1	10.2.1	10.2.1	10.2.2	10.2.2					
32:	10.3.5	10.3.5	10.3.5	10.3.5	10.3.5	10.3.5	10.3.5	10.3.5	10.3.5				
33:	10.2.5	10.2.5	10.2.5	10.2.5	10.2.5	10.2.5	10.2.5	10.2.5	10.2.5				
34:	10.2.1	10.2.1	10.2.1	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	10.3.2	
35:	10.3.4	10.4.1	10.4.1	10.4.1	10.4.1	10.4.1	10.4.1	10.4.1					
36:	10.3.4	10.3.4	10.3.4	10.3.4	10.3.4	10.3.4	10.4.4	10.4.4	10.4.4	10.4.4			

Table 10.9 (continued)
Objectives Coded to Each Item by Reviewers
West Virginia Grade 10 Mathematics--November 2003

37:	10.3.4	10.3.4	10.3.4	10.3.4	10.3.4	10.3.4	10.3.4	10.4.4												
38:	10.2.7	10.2.7	10.2.8	10.2.8	10.2.8	10.2.8	10.2.8	10.2.8												
39:	10.3.2	10.3.3	10.3.5	10.3.5	10.3.5	10.3.5	10.3.5	10.3.5												
40:	10.2.1	10.2.1	10.2.1	10.2.1	10.2.1	10.2.1	10.2.1	10.2.1												
41:	10.1.1	10.1.2	10.1.2	10.1.2	10.1.2	10.1.2	10.1.2	10.1.2												
42:	10.2.2	10.2.2	10.2.2	10.2.2	10.2.2	10.2.2	10.2.2	10.3.3												
43:	10.2.1	10.2.1	10.2.1	10.2.1	10.2.1	10.2.6	10.2.8	10.2.8												
44:	10.1.2	10.2.6	10.2.6	10.2.6	10.2.6	10.2.6	10.2.6	10.2.6	10.2.8	10.2.8										
45:	10.1.1	10.1.1	10.2.2	10.3.3	10.3.3	10.3.3	10.3.3	10.3.3												
46:	10.5.2	10.5.2	10.5.2	10.5.2	10.5.2	10.5.2	10.5.3	10.5.3												
47:	10.2	10.5.1	10.5.1	10.5.1	10.5.1	10.5.1	10.5.1	10.5.1												
48:	10.2.2	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.2.9												
49:	10.3.3	10.3.3	10.3.3	10.3.3	10.3.3	10.3.3	10.3.3	10.3.3	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4	10.4.4					

Table 10.10
 Items Coded by Reviewers to Each Objective
 West Virginia Grade 10 Mathematics--November 2003

Low		Medium		High
0		13.54839		57
root:				
10.1:	13			
10.1.1:	1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 5 5 5 5 5 5 6 6 6 6 6 6 6 6 8 8 8 8 8 8 8 8			
	11 12 12 12 12 12 12 12 13 13 13 13 13 25 25 25 28 41 45 45			
10.1.2:	41 41 41 41 41 41 41 44			
10.1.3:	19 19 27 27 27 27 27 27 27 27			
10.2:	4 4 4 4 4 4 4 4 47			
10.2.1:	15 15 15 17 31 31 31 31 31 31 34 34 34 40 40 40 40 40 40 40 40 43 43 43 43 43			
10.2.2:	31 31 42 42 42 42 42 42 42 45 48			
10.2.3:	12			
10.2.4:	1 3 3 3 3 3 3 3 4 20 20 20 20 20 20 20 20 25 25 48 48 48 48 48 48			
10.2.5:	25 25 25 25 25 25 33 33 33 33 33 33 33 33			
10.2.6:	17 17 17 17 17 17 26 26 26 26 26 26 26 26 43 44 44 44 44 44 44 44			
10.2.7:	22 22 29 29 38 38			
10.2.8:	15 15 15 15 15 22 22 22 22 22 22 29 29 29 29 29 29 38 38 38 38 38 38 43 43 44 44			
10.2.9:	3 48			
10.3:				
10.3.1:				
10.3.2:	14 14 14 14 14 14 14 14 18 18 18 23 23 23 23 23 23 23 23 34 34 34 34 34 34 34 34 39			
10.3.3:	30 30 30 30 30 30 30 30 39 42 45 45 45 45 45 49 49 49 49 49 49 49 49			
10.3.4:	35 36 36 36 36 36 36 37 37 37 37 37 37 37			
10.3.5:	32 32 32 32 32 32 32 32 39 39 39 39 39 39			
10.4:	11 11 11 11 11 11 13 13			
10.4.1:	18 18 18 18 18 19 35 35 35 35 35 35 35			
10.4.2:	5 5 11 11 12 16 16 21 28 28 28 28 28 28			
10.4.3:				
10.4.4:	16 16 16 16 16 16 16 17 19 19 19 19 19 21 21 21 21 21 21 21 21 28 36 36 36 36 37 49 49 49 49 49			
10.5:				
10.5.1:	24 24 24 24 24 24 24 24 47 47 47 47 47 47 47			
10.5.2:	46 46 46 46 46 46			
10.5.3:	10 10 10 46 46			
10.5.4:	7 7 7 7 7 7 7 7 8 8 8 8 9 9 9 9 9 9 9 9 10 10 10 10 10 10 10 10			

