REPORT

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

Norman L. Webb
January 14, 2004

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This study is one of three alignment studies conducted for the State of West Virginia. The Alignment Analysis Institute was held November 9, 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 science 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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Executive Summary

This is a report of the results from a two and a half-day Alignment Analysis Institute that was conducted November 9, 10, and 11, 2003, in Charleston, West Virginia. This analysis used data from a prior analysis conducted July 14-16, 2003. Eight people, including state science consultants, content experts, district science supervisors, and science teachers, analyzed the agreement between the state's science 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 science for seven grades indicates that their alignment is in need of improvement. The alignment of the science standards and assessment was judged to be strong for one standard (standard 4—Subject Matter and Concepts), moderate for one standard (standard 2—Inquiry), and weak for the other four standards, mainly because of the skewed distribution of the assessment items among the six standards. Some improvement in the alignment between July and November was observed by the reviewers and from the analyses of the data. The pattern of alignment among the standards was very consistent across the seven grades. It is possible to achieve an adequate level of alignment by replacing on an average of 10 existing items currently measuring content related to standards 2 and 4 with items that measure content related to the other four standards.

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

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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 and a half-day Alignment Analysis Institute was conducted November 9, 10, and 11, 2003, in Charleston, West Virginia. Eight people, including state science consultants, content experts, district science supervisors, and science teachers analyzed the agreement between the state's science 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 science educators served as reviewers for both alignment analyses. In science, the alignment of standards and assessments was analyzed for seven grade levels. The reviewers analyzed one form of the operational test that was created in consultation with 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 grade 3, items were numbered 1-21 (session 2) and then T1 through T29 (session 1) on the test form analyzed. Test items T1 through T29 corresponded to items 1 through 29 (session 1) on the test form analyzed in July. In this report, the items are numbered sequentially 1 through 50, with item 22 representing T1, item 23 representing T2, etc. For grade 3, care must be taken in comparing an item analyzed in November with an item analyzed in July because a different number system was used. For the six other grades, session 1 of the test were the first items on the test forms. Thus, session 1 items in the November analysis were exactly the same items as session 1 items in the July

analysis. Only a few of the items in session 2 at the other grades were the same as items analyzed in July. The session 2 items that were the same in both the July analysis and the November analysis did not have the same item numbers. The session 1 items with the same item number for both of the alignment analyses were items 1–30 (grades 4, 5, and 6), items 1–27 (grades 7 and 8), and items 1–25 (grade 10).

States use a variety of labels for identifying levels of expectations. For the purposes of this analysis, we have employed the convention of standards, goals, and objectives to describe three levels of expectations for what students are to know and do. Standard is the most general; it is divided into goals, which are further subdivided into objectives. It is assumed that all of the goals under a standard span the content knowledge expressed in the standard and all of the objectives under a goal span the content knowledge expressed in the goal.

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 on depth-of-knowledge levels for the objectives determined in July were used for the November analysis. The science objectives by depth-of-knowledge (DOK) levels by grade are included as Table 12 at the end of the Appendix. For this analysis, 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. The science reviewers began analyzing test items in the late afternoon on the day of arrival and then continued for two days, along with the review of the other two content areas, mathematics and reading language arts. The science reviewers felt they needed additional time because of the large number of science objectives at each grade level that had to be considered in the analysis.

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 any two in 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 opinions 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 science 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 science skill.

The results produced from the institute pertain only to the issue of agreement between the state standards and the state assessment instrument. This alignment analysis does not serve as external verification of the general quality of a state's standards or assessments. The results of the alignment institute do provide the evaluations of content area experts, independent of any of the participating states, who are very familiar with state and national standards. 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.

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 subscale for estimating students' mastery of content on that subscale. Of course, many factors have to be considered in determining what a reasonable number is, including the reliability of the subscale, the mean score, and cutoff score for determining mastery.

Using a procedure developed by Subkoviak (1988) and assuming that the cutoff score is the mean and that the reliability of one item is .1, it was estimated that six items would produce an agreement coefficient of at least .63. This indicates that about 63% of the group would be consistently classified as masters or nonmasters if two equivalent test administrations were employed. The agreement coefficient would increase if the cutoff score is increased to one standard deviation from the mean to .77 and, with a cutoff score of 1.5 standard deviations from the mean, to .88. Usually states do not report student results by standards or require students to achieve a specified cutoff score on subscales 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 subscale.

Depth-of-Knowledge Consistency

Standards and assessments can be aligned not only on the category of content covered by each, but also on the basis of the complexity of knowledge required by each. *Depth-of-knowledge consistency between standards and assessment indicates alignment if what is elicited from students on the assessment is as demanding cognitively as what students are expected to know and do as stated in the standards.* For consistency to exist between the assessment and the 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 (DOK) 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 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.

Four levels of depth of knowledge were used for this analysis. Because the fourth level is rare or even absent in most standardized assessments, reviewers usually made distinctions among DOK levels 1, 2 and 3. Please note that, in science, "knowledge" can refer both to content knowledge and knowledge of scientific processes. This meaning of knowledge is consistent with the *National Science Education Standards* (NSES), which terms "Science as Inquiry" as its first Content Standard.

Level 1 (Recall and Reproduction) is the recall of information such as a fact, definition, term, or a simple procedure, as well as performing a simple science process or procedure. Level 1 only requires students to demonstrate a rote response, use a well-known formula, follow a set procedure (like a recipe), or perform a clearly defined series of steps. A "simple" procedure is well-defined and typically involves only one-step. Verbs such as "identify," "recall," "recognize," "use," "calculate," and "measure" generally represent cognitive work at the recall and reproduction level. Simple word problems that can be directly translated into and solved by a formula are considered Level 1. Verbs such as "describe" and "explain" could be classified at different DOK levels, depending on the complexity of what is to be described and explained.

A student answering a Level 1 item either knows the answer or does not: that is, the answer does not need to be "figured out" or "solved." In other words, if the knowledge necessary to answer an item automatically provides the answer to the item, then the item is at Level 1. If the knowledge necessary to answer the item does not automatically provide the answer, the item is at least at Level 2. Some examples that represent, but do not constitute all of, Level 1 performance are:

- Recall or recognize a fact, term, or property.
- Represent in words or diagrams a scientific concept or relationship.
- Provide or recognize a standard scientific representation for simple phenomenon.
- Perform a routine procedure such as measuring length.

Level 2 (Skills and Concepts) includes the engagement of some mental processing beyond recalling or reproducing a response. The content knowledge or process involved is *more complex* than in Level 1. Items require students to make some decisions as to how to approach the question or problem. 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. Level 2 activities include making observations and collecting data; classifying, organizing, and comparing data; and organizing and displaying data in tables, graphs, and charts.

Some action verbs, such as "explain," "describe," or "interpret," could be classified at different DOK levels, depending on the complexity of the action. For example, interpreting information from a simple graph, requiring reading information from the graph, is at Level 2. An item that requires interpretation from a complex graph, such as making decisions regarding features of the graph that need to be considered and how information from the graph can be aggregated, is at Level 3. Some examples that represent, but do not constitute all of Level 2 performance, are:

- Specify and explain the relationship between facts, terms, properties, or variables.
- Describe and explain examples and non-examples of science concepts.
- Select a procedure according to specified criteria and perform it.
- Formulate a routine problem given data and conditions.

- Organize, represent and interpret data.

Level 3 (Strategic Thinking) requires reasoning, planning, using evidence, and a higher level of thinking than the previous two levels. The cognitive demands at Level 3 are complex and abstract. The complexity does not result only from the fact that there could be multiple answers, a possibility for both Levels 1 and 2, but because the multi-step task requires more demanding reasoning. In most instances, requiring students to explain their thinking is at Level 3; requiring a very simple explanation or a word or two should be at Level 2. An activity that has more than one possible answer and requires students to justify the response they give would most likely be at Level 3. Experimental designs in Level 3 typically involve more than one dependent variable. 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 non-routine problems. Some examples that represent, but do not constitute all of, Level 3 performance, are:

- Identify research questions and design investigations for a scientific problem.
- Solve non-routine problems.
- Develop a scientific model for a complex situation.
- Form conclusions from experimental data.

Level 4 (Extended Thinking) makes high cognitive demands and requires complex thinking. Students are required to make several connections—relate ideas within the content area or among content areas—and have to select or devise one approach among many alternatives on how the situation can be solved. Many on-demand assessment instruments will not include any assessment activities that could be classified as Level 4. However, standards, goals, and objectives can be stated in such a way as to expect students to perform extended thinking. "Develop generalizations of the results obtained and the strategies used and apply them to new problem situations," is an example of a Grade 8 objective that is at Level 4. Many, but not all, performance assessments and open-ended assessment activities requiring significant thought will be Level 4.

Level 4 requires complex reasoning, experimental design and planning, and probably will require an extended period of time either for the science investigation required by an objective, or for carrying out the multiple steps of an assessment item. However, the extended time period is not a distinguishing factor if the required work is only repetitive and does not require application of 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 activity. However, if the student conducts a river study that requires taking into consideration a number of variables, this would be at Level 4. Some examples that represent, but do not constitute all of, Level 4 performance are:

- Based on provided data from a complex experiment that is novel to the student, deduct the fundamental relationship between several controlled variables.
- Conduct an investigation, from specifying a problem to designing and carrying

out an experiment, to analyzing its data and forming conclusions.

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 science 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

In July, the eight reviewers reached consensus on the depth-of-knowledge (DOK) level for each objective under each of the six standards for each grade level prior to coding the items. The distributions of the DOK levels for each grade are presented in Table 1. The actual DOK level for each objective by grade is given in Table 12 at the end of the Appendix. Reviewers agreed that from 80% to 90% of the science objectives had a depth-of-knowledge level of 1 (Recall) or 2 (Skills and Concepts). About 10% to 20% of the objectives had a depth-of-knowledge level of 3 (Strategic Thinking). The reviewers did not rate any of the objectives at a depth-of-knowledge level of 4 (Extended Thinking). The distribution of objectives by depth-of-knowledge level was very consistent across the seven grades.

At all of the grades, reviewers were unable to find a precise objective that corresponded to assessment items and had to code items as corresponding to generic objectives—a standard rather than a specific objective under a standard. This indicates some misfit between the assessment and the standards, but could be a problem in the phrasing of the objectives under standards rather than the content of an assessment item. Reasons that could result in the need to code items as corresponding to a generic objective include the fact that students at another grade level are expected to achieve the content, or that there are omissions in the existing objectives.

In the November alignment analysis across all eight grades, two or more reviewers coded 71 items as corresponding to generic objectives, almost one-fourth of the items. This is larger than the 57 items that two or more reviewers coded as corresponding

Table 1
Percent of Objectives by Depth-of-Knowledge Levels for Each Grade, West Virginia Alignment Analysis for Science

Grade	Number of Objectives	DOK Level	# of objs by Level	% w/in std by Level
Grade 3	45	1 2 3	16 23 6	35 51 13
Grade 4	59	1 2 3	18 34 7	30 57 11
Grade 5	48	1 2 3	15 24 9	31 50 18
Grade 6	54	1 2 3	16 28 10	29 51 18
Grade 7	57	1 2 3	21 26 10	36 45 17
Grade 8	60	1 2 3	24 25 10	40 42 16
Grade 10	66	1 2 3	22 37 7	33 56 10

to generic objectives in the July analysis. Changes made in the items between July and November did not result in reducing the number of items for which reviewers had difficulty in identifying an appropriate objective. All of the items coded by two or more reviewers as corresponding to generic objectives are listed in Table 2. They also are noted in the grade level tables, Tables 3.8, 4.8, 5.8, 6.8, 7.8, 8.8, and 10.8, as not having a number for the objective under the primary or secondary objectives. For some items, reviewers left the space for the primary objective blank. The use of generic standards can indicate that the objectives under a standard do not fully cover all of the content under that standard.

The items that five or more of the reviewers coded as corresponding to generic objectives are the most problematic in the alignment of the assessment and the standards. These are items 22 (grade 3), items 12 and 32 (grade 4), item 14 (grade 6), items 17 and 23 (grade 7), item 25 (grade 8), and items 2, 15, and 22 (grade 10). The specific content measured by each of these items did not closely match what was stated by the objectives for the grade. These items require further review. If the science measured by the items is

judged important, then the objectives need to be rephrased to incorporate the content measured by the item. If the science measured by the item is judged to be of lesser importance, then the item should not be included on the assessment. Reviewers showed some consistency in assigning items to a generic objective between the July analysis and the November analysis. Items which two or more reviewers coded as related to generic objectives in both analyses are noted in Table 1 by an asterisk (*).

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

Grade	Item Number	Corresponding Standard[a]	Number of Reviewers
Grade 3	11	Inquiry (3.2.0)	2
	13	Inquiry (3.2.0)	4
	22 (1)[b]	Subj Matter/Concept (3.4.0)	6
	24 (3)*	Subj Matter/Concept (3.4.0)	3
	31 (10)	Subj Matter/Concept (3.4.0)	3
	44 (23)*	Subj Matter/Concept (3.4.0)	3
	45 (28)	Subj Matter/Concept (3.4.0)	3
Grade 4	7*	History/Nature (4.1.0)/Design/Application (4.5.0)	2
	11	Subj Matter/Concept (4.4.0)	4
	12	Subj Matter/Concept (4.4.0)	6
	13*	Subj Matter/Concept (4.4.0)	3
	18	History/Nature (4.1.0)	2
	28*	Subj Matter/Concept (4.4.0)	3
	32	Subj Matter/Concept (4.4.0)	6
	37	Inquiry(4.2.0)/Design/Application (4.5.0)	2
	38	Subj Matter/Concept (4.4.0)	2
Grade 5	3*	Inquiry (5.2.0)	3
	4*	Subj Matter/Concept (5.4.0)/Unifying Theme (5.3.0)	3
	5	Personal/Social (5.6.0)	2
	6	Subj Matter/Concept (5.4.0)	3
	10	Subj Matter/Concept (5.4.0)	2
	14*	Inquiry (5.2.0)/ Subj Matter/Concept (5.4.0)	3
	19*	Subj Matter/Concept (5.4.0)	2
	23	Inquiry (5.2.0)	2
	25*	Subj Matter/Concept (5.4.0)	3
	30*	Inquiry (5.2.0)	3
	35	Inquiry (5.2.0)	2
	41	Subj Matter/Concept (5.4.0)	2

Table 2 (continued)
Assessment Tasks Coded by Two or More Raters as Corresponding to Generic Objectives

Grade	Item Number	Corresponding Standard[a]	Number of Reviewers
Grade 6	2*	Subj Matter/Concept (6.4.0)	4
	14*	Subj Matter/Concept (6.4.0)	6
	23*	Subj Matter/Concept (6.4.0)/ Inquiry (6.2.0)	3
	29*	Subj Matter/Concept (6.4.0)	4
	36	Design/Application (6.5.0)/Inquiry (6.2.0)	3
Grade 7	3	Subj Matter/Concept (7.4.0)	2
	5*	Subj Matter/Concept (7.4.0)	4
	11*	Personal/Social (7.6.0)	3
	17*	Subj Matter/Concept (7.4.0)	6
	21*	Subj Matter/Concept (7.4.0)	4
	23*	Subj Matter/Concept (7.4.0)	6
	44	Subj Matter/Concept (7.4.0)	3
	45	Subj Matter/Concept (7.4.0)	2
Grade 8	2	Subj Matter/Concept (8.4.0)	2
	4	Subj Matter/Concept (8.4.0)	4
	6	Subj Matter/Concept (8.4.0)	2
	9	Subj Matter/Concept (8.4.0)	2
	12	Subj Matter/Concept (8.4.0)	2
	17	Inquiry (8.2.0)	2
	20	Subj Matter/Concept (8.4.0)	4
	21	Subj Matter/Concept (8.4.0)/ Personal/Social (8.6.0)	2
	25	Subj Matter/Concept (8.4.0)/Inquiry (8.2.0)	5
	27	Subj Matter/Concept (8.4.0)	3
	32	Personal/Social (8.6.0)	2
	34	Subj Matter/Concept (8.4.0)/Personal/Social (8.6.0)	2
	36	Subj Matter/Concept (8.4.0)	3
	43	Subj Matter/Concept (8.4.0)	2
Grade 10	2	Inquiry (10.2.0)/ Subj Matter/Concept (10.4.0)	5
	3	Inquiry (10.2.0)	3
	5	Subj Matter/Concept (10.4.0)/ Inquiry (10.2.0)	2
	10*	Subj Matter/Concept (10.4.0)/ Personal/Social (10.6.0)	2
	14*	Subj Matter/Concept (10.4.0)	4
	15	Design/Application (10.5.0)/Personal/Social (10.6.0)/History/Nature (10.1.0)	5
	16	Subj Matter/Concept (10.4.0)/ Inquiry (10.2.0)/ Design/Application (10.5.0)	4
	17	Subj Matter/Concept (10.4.0)/ Inquiry (10.2.0)/ Design/Application (10.5.0)	3
	19	Inquiry (10.2.0)/History/Nature (10.1.0)	2

Table 2 (continued)
Assessment Tasks Coded by Two or More Raters as Corresponding to Generic Objectives

Grade	Item Number	Corresponding Standard[a]	Number of Reviewers
	20	Subj Matter/Concept (10.4.0)	3
	21*	Subj Matter/Concept (10.4.0)	3
	22*	Subj Matter/Concept (10.4.0)	5
	23*	Subj Matter/Concept (10.4.0)	2
	24	Subj Matter/Concept (10.4.0)/ Personal/Social (10.6.0)	3
	26	Subj Matter/Concept (10.4.0)	2
	32	Subj Matter/Concept (10.4.0)	2

[a] Subject Matter/Concepts, Science as Inquiry, History and Nature, Unifying Themes, Design and Application, Personal and Social Perspectives.
[b] Item numbers in parentheses ( ) are item numbers from test form analyzed in July.
* Items identified as corresponding to a generic objective in both July and November.

Alignment of Curriculum Standards and Assessments

Based on the data analysis produced from the reviewers' coding, the alignment between one of the six science curriculum standards (Standard 4: Subject Matter/ Concepts) and the assessment is very good. For each of the seven grades, the assessment and the standard met an acceptable level on each of the four alignment criteria (Table 3). Standard 4, an important standard, is broken down into a large number of objectives, from 23 at grade 4 to 40 at grade 10. The assessment has an adequate number of items, these items are at an appropriate DOK level; and they are distributed among the objectives with none of the objectives being overly emphasized. However, the alignment between the other five science curriculum standards and the assessment is less than adequate, primarily for two reasons: 1) too few items, and 2) items with a DOK level that is low compared to the corresponding objective. Even though there was some improvement in the alignment from the July analysis, mainly at grade 7 and grade 10, the results of the two alignment analyses are very similar. Besides the very good alignment between the assessments and Standard 4, the test forms have an adequate number of items measuring content related to Standard 2 (Inquiry) at each of the seven grades, but too small a proportion of these items have a DOK level that is the same or higher than the corresponding objective. The number of items on the assessment for each grade that measure content related to the other four standards generally range from 2 to 5 items, less than the 6-item requirement used for an acceptable level on the Categorical Concurrence criterion. The items that do measure content related to Standards 5 (Design and Application) and 6 (Personal and Social Perspectives) have a DOK level that is too low. With the exception of grade 3, the assessment and at least one standard does not meet the Range-of-Knowledge Correspondence criterion. The number of standards for which an acceptable level on the Range criterion has not been met increases by grade. However, the failure of the standards and the assessment to have an acceptable level on the Range criterion is directly related to the low number of items measuring the standard. The

alignment issues that do exist could be solved by adding or replacing about 9 to 14 items on the assessment at each grade, taking care to select items that have an appropriate DOK level and measure an appropriate range of objectives. The number of points given to an item was considered in adjusting the acceptable levels for the Categorical Concurrence and Depth-of-Knowledge Consistency criteria. When an adjustment was made and an acceptable level was achieved, the shading from the cell in Table 3 was removed (e.g. standard 3.6). Recommended changes for each grade level to improve the alignment between the standards and assessments are given below.

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

Standard	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
Grade 3				
3.1 – History/Nature	NO	YES	YES	YES
3.2 – Inquiry	YES	NO	YES	WEAK
3.3 – Unifying Themes	NO	YES	YES	YES
3.4 – Subj Matter/Concepts	YES	YES	YES	YES
3.5 – Design/Applic	NO	WEAK	YES	YES
3.6 - Personal/Social	NO	WEAK	YES	YES
Grade 4				
4.1 – History/Nature	NO	YES	YES	YES
4.2 – Inquiry	YES	WEAK	YES	YES
4.3 – Unifying Themes	NO	YES	NO	YES
4.4 – Subj Matter/Concepts	YES	YES	YES	YES
4.5 – Design/Applic	NO	NO	YES	YES
4.6 - Personal/Social	YES	NO	YES	YES

Table 3 (continued)
Summary of Acceptable Levels on Four Alignment Criteria Met by Assessments and Standards for Science

Standard	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
Grade 5				
5.1 – History/Nature	NO	YES	NO	YES
5.2 – Inquiry	YES	NO	YES	YES
5.3 - Unifying Themes	NO	YES	YES	YES
5.4 - Subj Matter/Concepts	YES	YES	YES	YES
5.5 – Design/Applic	NO	NO	YES	YES
5.6 - Personal/Social	NO	NO	YES	YES
Grade 6				
6.1 – History/Nature	NO	YES	WEAK	YES
6.2 – Inquiry	YES	NO	YES	YES
6.3 - Unifying Themes	NO	YES	YES	YES
6.4 - Subj Matter/Concepts	YES	YES	YES	YES
6.5 – Design/Applic	NO	NO	YES	YES
6.6 - Personal/Social	NO	NO	WEAK	YES
Grade 7				
7.1 – History/Nature	NO	YES	YES	YES
7.2 – Inquiry	YES	WEAK	YES	YES
7.3 - Unifying Themes	NO	YES	WEAK	YES
7.4 - Subj Matter/Concepts	YES	YES	YES	YES
7.5 – Design/Applic	NO	NO	YES	YES
7.6 - Personal/Social	YES	NO	YES	YES

Table 3 (continued)
Summary of Acceptable Levels on Four Alignment Criteria Met by Assessments and Standards for Science

Standard	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
Grade 8				
8.1 – History/Nature	NO	YES	YES	YES
8.2 – Inquiry	YES	NO	WEAK	YES
8.3 - Unifying Themes	NO	YES	NO	YES
8.4 - Subj Matter/Concepts	YES	YES	YES	YES
8.5 – Design/Applic	NO	NO	WEAK	YES
8.6 - Personal/Social	NO	NO	YES	YES
Grade 10				
10.1 – History/Nature	NO	YES	NO	YES
10.2 – Inquiry	YES	WEAK	WEAK	YES
10.3 - Unifying Themes	NO	YES	YES	YES
10.4 - Subj Matter/Concepts	YES	YES	YES	YES
10.5 – Design/Applic	NO	NO	NO	YES
10.6 - Personal/Social	NO	NO	WEAK	YES

Grade 3 Science

The alignment of the assessment and the curriculum standards at grade 3 is improved when the point value of 2 items related to objectives under standard 3.6 (Personal and Social) are considered. These items increase the total number of points of items measuring content related to this standard to 6 points. These 2 additional points also improve the value on the Depth-of-Knowledge Consistency criterion to an acceptable level. However, about 8 items still need to be replaced or added to increase the number of items on three of the standards. This is some improvement from the July analysis.

Changes needed for improving alignment at grade 3:

1. The addition of 8 new items could be achieved by replacing items currently measuring content under standards 3.2 (Inquiry) or 3.4 (Subject Matter and Concepts), or by adding items to the assessment. Three more items are needed to measure content related to standard 1 (History and Nature). One or two additional items are needed to measure content related to standard 3.3 (Unifying Theme). Three or four items are needed to measure content related to standard 3.5 (Design and Application
2. The DOK level on about 5 items currently measuring content related to standard 3.2 (Inquiry) need to be replaced by items with the same or higher DOK level of the corresponding objectives to improve the value on the Depth-of-Knowledge Consistency criterion. The alignment could also be improved if items currently measuring objectives under standard 3.2 with DOK levels lower than that of the corresponding objective are replaced by items to measure those standards in need of additional items. Of course, care needs to be taken to retain at least 6 items measuring content related to standard 3.2. The above modifications in the items related to standard 3.2 should also improve the value on the Balance of Representation.
3. The weak alignment on the Depth-of-Knowledge Consistency criterion for standard 3.5 can simply be taken care of by carefully selecting 3 additional items to measure content related to this standard.

Grade 4 Science

The alignment at grade 4 can be improved with changes similar to those suggested for grade 3. The 5 items with point values of 2 do not measure the appropriate content, or are at a DOK level that would change the alignment results at this grade level.

Changes needed for improving alignment at grade 4:

1. Additional items need to be added that measure objectives under three of the six standards—2 items need to be added to measure content related to standard 4.1 (History and Nature), 4 items need to be added to measure content related to standard 4.3 (Unifying Themes), and 4 items need to be added to measure content related to standard 4.5 (Scientific Design and Application). These items could replace items currently measuring content related to standard 4.4 (Subject Matter and Concepts), or they could be new items added to the assessment. These results are very similar to those from the July analysis.
2. Two items currently measuring content related to standard 4.2 (Inquiry) need to be replaced by items with a higher DOK level with respect to the corresponding objective. If the additional items that are added to measure content related to standard 4.5 are selected at an appropriate DOK level, this will successfully improve the value on the Depth-of-Knowledge Consistency criterion. One or two of the current items measuring content related to standard 4.6 (Personal and Social) should be replaced by items

with higher DOK levels in relationship to the DOK of the corresponding objective.

3. With care in selecting additional items for standard 4.3, content from a greater number of the objectives can be measured by taking care of the current low value under the Range-of-Knowledge Correspondence criterion.

Grade 5 Science

Four of the 5 two-point items for grade 4 correspond to objectives under standard 5.4 (Subject Matter and Concepts) and thus do not improve the count of items under the other standards. The other item (#33), corresponds to an objective under standard 5.1 (History and Nature). However, adding one more point value for standard 5.1 is insufficient to overcome the deficiency for that standard under Categorical Concurrence.

Changes needed for improving alignment at grade 5:

1. Additional items need to be added that measure objectives under four of the six standards—4 items need to be added to measure content related to standard 5.1 (History and Nature), 2 items need to be added to measure content related to standard 5.3 (Unifying Themes), 2 items need to be added to measure content related to standard 5.5 (Scientific Design and Application), and 1 item needs to be added to measure content related to standard 5.6 (Personal and Social). These items could replace items currently measuring content related to standard 4 (Subject Matter and Concepts), or be new items added to the assessment.
2. If the additional items corresponding to standards 5.5 are selected with appropriate DOK levels, then this will bring the value on the Depth-of-Knowledge Consistency criterion to an acceptable level. However, nearly all of the 5 items currently measuring content related to standard 5.6 have a DOK below the DOK level of the corresponding objectives. At least 2 of these items need to be replaced with items that have a higher DOK level, along with another item needed to increase the number of items for the standard to 6. Two of the current items measuring content related to standard 5.2 with a DOK level below the corresponding objective need to be replaced with items that have the same or higher DOK level as the corresponding objective.
3. If the additional items for standard 5.1 are selected to measure objectives not currently measured by the 2 existing items, then the unacceptable level on the Range-of-Knowledge Correspondence objective will be improved to an acceptable table. No additional items are needed beyond those already noted.

Grade 6 Science

The alignment issues at grade 6 are very similar to those at grade five. The two-point items (#37 and 40) help some to increase the total number of point values standards 6.3 (Unifying Themes) and 6.6 (Personal and Social), but the number of points is not sufficient to overcome the additional items needed. The results in November were very similar to the results from the July analysis.

Changes needed for improving alignment at grade 6:

1. Additional items need to be added that measure objectives under four of the six standards—3 items need to be added to measure content related to standard 1 (History and Nature), 3 items need to be added to measure content related to standard 3 (Unifying Themes), 4 items need to be added to measure content related to standard 5 (Scientific Design and Application), and 3 items need to be added to measure content related to standard 6 (Science in Personal and Social Perspectives). These items could replace items currently measuring content related to standard 4 (Subject Matter and Concepts), or be new items added to the assessment.
2. By selecting the additional items for standards 6.5 and 6.6 with care, so that the DOK levels of the items are the same as or above the DOK levels of the corresponding objectives, the concerns on the Depth-of-Knowledge Consistency criterion will be eliminated. However, to improve the unacceptable level on this criterion for standard 6.2 would require replacing 3 of the existing 18 items measuring content related to this standard with items that have a higher DOK level, the same or above that of the corresponding objectives.
3. The weak values for the Range-of-Knowledge Correspondence criterion on standards 6.1 and 6.6 can be eliminated by carefully selecting any additional items to measure at least one other objective that currently does not have a related assessment item.

Grade 7 Science

Along with grades 4 and 5, grade 7 requires fewer additional items than the assessments for the other four grade levels, about 10. Reviewers found over seven items that corresponded to standard 7.6 (Personal and Social), more than for any other standard. However, about one half of these items need to be replaced by items with a higher DOK level in relation to the DOK level of the corresponding objective. The four items valued at two points do not really help reduce some of the alignment items because they all correspond to standards 7.2 or 7.4.

Changes needed for improving alignment at grade 7:

1. Additional items need to be added that measure objectives under three of the six standards—3 items need to be added to measure content related to

standard 7.1 (History and Nature), 3 items need to be added to measure content related to standard 7.3 (Unifying Themes), and 4 items need to be added to measure content related to standard 7.5 (Scientific Design and Application). These items could replace items currently measuring content related to standard 7.4 (Subject Matter and Concepts), or be added to the assessment as new items.

2. At least 2 of the 4 items to be added to measure standard 7.5 need to be at a DOK level that is the same as or above the DOK level of the corresponding objectives. As noted above, at least 3 of the 7 items that currently measure objectives under standard 7.6 need to be replaced by items with a DOK level that is the same or above the DOK level of the corresponding objectives, such as items 10, 11, and possibly item 33. About 3 of the current items measuring content related to standard 7.2 (Inquiry) need to be replaced by items with a DOK the same as or higher than the DOK level of the corresponding objectives in order to improve the value on the Depth-of-Knowledge Consistency criterion.
3. The weak value on the Range-of-Knowledge Correspondence criterion for standard 7.3 (Unifying Themes) can easily be taken care of if any items added to measure this standard measure content related to at least one objective not currently assessed.

Grade 8 Science

Alignment at grade 8 in November was about the same as the alignment was in July. About 13 items need to be added or replaced for the same standards at the other grade levels. The 5 constructed-response items relate to the standards 8.2 and 8.5, so do not help to improve the alignment on the other four standards where the need is the greatest.

Changes needed for improving alignment at grade 8:

1. Additional items need to be added that measure objectives under four of the six standards—4 items need to be added to measure content related to standard 8.1 (History and Nature), 4 items need to be added to measure content related to standard 8.3 (Unifying Themes), 3 or 4 items need to be added to measure content related to standard 8.5 (Scientific Design and Application), and 1item needs to be added to measure content related to standard 8.6 (Science in Personal and Social Perspectives). These items could replace items currently measuring content related to standard 8.4 (Subject Matter and Concepts), or be added to the assessment as new items.
2. Five of the items now measuring content related to standard 2 (Inquiry) need to be replaced by items with a DOK level that is at least the same as the DOK level of the corresponding objective. If at least 2 of the additional items for standard 8.5 (Design and Application) have a DOK level that is the same as or higher than the DOK level of the corresponding

objective, then Depth-of-Knowledge Consistency criterion will have an acceptable level for that standard. Two of the existing items measuring content related to standard 8.6 (Personal and Social) along with the one additional item need to have a DOK level that is the same as or higher than the DOK level of the corresponding objective.

3. As for the other grades, the unacceptable levels on the Range-of-Knowledge Correspondence criterion can all be changed to an acceptable level by measuring content related to only one or two more objectives than those currently assessed for standards 8.2, 8.3, and 8.5.

Grade 10 Science

The results from the eight reviewers indicated that there was some improvement at grade 10 in November compared to the July analysis. Standard 10.4 (Subject Matter and Concepts) is still overemphasized but not to as great an extent as on the form analyzed in July. The 5 constructed-response items measure content related to standard 10.4 and do not help to improve the alignment between the assessment and the other five standards.

Changes needed for improving alignment at grade 10:

1. Additional items need to be added to the four assessment standards—4 for standard 1 (History/Nature), 1 or 2 for standard 3 (Unifying Themes), 4 for standard 5 (Design and Applications), and 2 for standard 6 (Science in Personal and Social Perspectives). These items need to be selected at a DOK level that is at least the same as the DOK level of the corresponding objectives and the objectives measured need to be different from those currently measured. These actions will improve the alignment on the Categorical Concurrence, Depth-of-Knowledge Consistency, and Range-of-Knowledge Correspondence criteria for all of the standards.
2. Only 1 or 2 of the existing items relating to standard 10.2 (Inquiry) need to be replaced by items measuring content from one other of the objectives not currently assessed and at an appropriate DOK level.

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). 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 science in West Virginia addresses the concerns of the reviewers.

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). 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 indicate that other reviewers have a concern about a specific item.

General Comments Made by the Reviewers

After coding the assessment items for each grade level, the reviewers were asked for their opinions on the general alignment between the standards and the assessments. For science, the group leader, Ted Britton, summarized the discussion of the eight reviewers.

1. *Improved alignment between assessment items and framework objectives*.

It was apparent to the reviewers that since July, West Virginia staff and others had done work to enhance the alignment of items with objectives. For each grade, most reviewers felt the set of items only needed *slight* improvement to achieve the degree of alignment needed for meaningful test administration. The exception is for grades 5 and 10 (the latter more than the former). At these grades, the reviewers felt that *significant improvement* in alignment between the standards and the assessment items still is desirable. The group felt the greatest misalignments occurred in the items that are required to compare to national norms rather than those created expressly for the state's instruments.

While reviewers had an overall sense of improved alignment, some reviewers did feel that in November there were items that forced them to code at the standard level (generic objective) rather than to a specific objective more often than in July. Reviewers wondered whether this was an accurate perception and a valid decision, or a function of being less familiar with the objectives in November (because they did not spend time assigning DOK levels to them and instead merely reviewed them before coding items).

2. *Some grade level discrepancy still existed*.

Reviewers still noticed instances, at every grade level, where particular items would have been obviously better aligned with an objective for a preceding grade. However, they did not recall encountering instances of items being too advanced—i.e., where the item would be better aligned with objectives at a higher grade level than the assessment being analyzed.

3. *Depth of knowledge seemed generally consistent across grades*.

Reviewers felt overall that sets of items reflected similar arrays of depth of knowledge across the grade levels. In the July review, reviewers had strongly noticed unevenness of

the distribution of the DOK levels among items, where average DOK levels for some grades seemed notably different than the average DOK levels of other grades.

4. *Content coverage somewhat narrow*.

While reviewers acknowledged that they had only inspected one assessment form of four and that the state had imposed some constraints on how the instrument could be constructed, reviewers nevertheless felt that some objectives were overemphasized while many other objectives were never assessed. This phenomenon was exacerbated by recurring topics across grades, such as assessing every grade level, whether students could read data from a table, instead of discontinuing assessing this lower-grade objective at some point. Conservation of natural resources and food chains/webs were two other examples of over-represented topics across grade levels.

5. *Open-ended vehicle could be used for higher Depth of Knowledge.*

Reviewers felt that open-ended items could have been used to assess more complex understanding and thinking, especially in the higher grades. While most open-ended items were rated with a DOK level of 2 or more, a greater number of these items could have been designed to require a DOK level of 3.

Reliability Among Reviewers

The intraclass correlation among the reviewers' assignment of DOK levels to items was generally acceptable, above 0.800 (Table 4). The intraclass correlations fell below 0.800 only for grade 4. It is difficult to determine the precise reason for the drop in reliability for this grade level, other than the fact that coding for this grade level occurred at the end of the first evening and the beginning of the next morning. That is, reviewers were very consistent in assigning a DOK level to items. The average reliability across the seven analyses in November was higher than the average in July, 0.827 compared to 0.783. The DOK level assigned by each reviewer for each grade is given in Table __.6 in the Appendix.

Table 4
Intraclass Correlation Among Eight Reviewers in Assigning Item Depth-of-Knowledge Level

Grade	Intraclass Correlation
3	0.835
4	0.734
5	0.843
6	0.866
7	0.826
8	0.820
10	0.865

Summary

The alignment of the science curriculum standards for the seven grades and the corresponding assessments still needs improvement in West Virginia. The assessments at each grade level primarily measure content related to two of the six curriculum standards—2) Unifying Themes and 3) Subject Matter and Concepts. Reviewers found that all of the other standards at least had one or two items that measured content related to those standards, but the number of the related items fell short of the requirement of six items used as the acceptable level to be able to report on a student's performance on a standard. Across the grade levels, standard 5 (Design and Applications) followed by standard 1 (History and Nature) had the fewest number of corresponding items, on the average of two or three items. It was clear to the reviewers and from the analysis that there was some increase in the number of items that related to these less emphasized standards. Corresponding to the low number of items related to these standards, over half of the items that were on the assessments that corresponded to standards 2, 5, and 6 had a DOK level that was below that of the corresponding standard. In addition, across the grades an increasing number of the standards and the assessments failed to meet an acceptable level on the Range-of-Knowledge Correspondence criterion. That is, less than half of the objectives under a standard had at least one item measuring related content. All of the alignment issues with items too low and too narrow in distribution across the objectives could be reduced significantly, or be eliminated by carefully adding items to increase the number for each standard to at least six. It is very apparent that standard 4 (Subject Matter and Concepts) is a dominant standard simply by the number of objectives specified under the standard in relation to the other standards. Over the seven grades, the number of objectives under standard 4 ranges from 23 (grade 3) to 40 (grade 10). The number of objectives under any of the other five standards ranges from 2 to 9. Even with the large number of objectives, there was very good alignment between standard 4 and the assessment at each grade level. At each of the grades, this alignment could be maintained by replacing a sufficient number of items related to standards 2 and 4 with items measuring content related to the other standards to achieve alignment on these standards. In their comments, the reviewers identified some areas that were overassessed, which provides some indication of what items could be replaced, such as reading data from a table. Overall, the alignment of the science standards and assessment was judged to be strong for standard 4, moderate for standard 2 and weak for the other four standards, mainly because of the distribution of the assessment items among the six 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.

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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

	First five columns repeat columns from Table 1.
Level of Item w.r.t. Stand	Mean percent and standard deviation of items coded as "under" the Depth-of-Knowledge level of the corresponding 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. — "Yes" indicates that 50% or more of the objectives had at least one coded objective.
"Weak" indicates that 40% to 50% of the objectives had at least one coded objective.
"No" indicates that 40% or less of the objectives had at least one coded objective.

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

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. — "Yes" indicates that the Balance Index was .7 or above (items evenly distributed among objectives).
"Weak" indicates that the Balance Index was .6 to .7 (a high percentage of items coded as corresponding to two or three objectives).
"No" indicates that the Balance Index was .6 or less (a high percentage of items coded as corresponding to one objective.)

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 12 (at the end of grade 10)

This table gives the consensus DOK levels for each objective for each grade from the July, 2003 analysis.

Table 3.1
Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 3 Science–-November 2003
Number of Assessment Items–50

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 - History/Nature	3	3	1	3	100	3.25	0.66	NO
3.2 - Inquiry	8	8.62	1 2 3	2 2 4	25 25 50	19	5.17	YES
3.3 - Unifying Themes	5	5	1 2	1 4	20 80	4.75	2.99	NO
3.4 - Subj Matter/Conc	23	24	1 2	9 14	39 60	30.88	5.42	YES
3.5 - Design/Applic	2	2	1 3	1 1	50 50	2.86	1.25	NO
3.6 - Personal/Social	4	4	2 3	3 1	75 25	4.12	0.60	NO
Total	45	46.62	1 2 3	16 23 6	35 51 13	64.5	10.57	

Table 3.2
Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 3 Science—November 2003
Number of Assessment Items–50

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 - History/Nature	3	3	3.25	0.66	0	0	58	48	42	48	YES
3.2 - Inquiry	8	8.62	19	5.17	73	41	16	24	11	22	NO
3.3 - Unifying Themes	5	5	4.75	2.99	41	46	51	46	7	24	YES
3.4 - Subj Matter/Concepts	23	24	30.88	5.42	42	42	47	40	11	27	YES
3.5 - Design/Application	2	2	2.86	1.25	55	47	42	45	2	8	WEAK
3.6 - Personal/Social	4	4	4.12	0.60	58	37	42	37	0	0	WEAK
Total	45	46.62	64.5	10.57	46	44	42	41	12	28	

Table 3.3
Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 3 Science—November 2003
Number of Assessment Items–50

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 - History/Nature	3	3	3.25	0.66	2	0	67	0	YES	5	1	0.84	0.02	YES
3.2 – Inquiry	8	8.62	19	5.17	4.88	0.78	56	8	YES	29	4	0.68	0.06	WEAK
3.3 – Unifying Themes	5	5	4.75	2.99	2.88	1.54	58	31	YES	7	5	0.91	0.07	YES
3.4 - Subj Matter/Conc	23	24	30.88	5.42	13.88	2.26	58	9	YES	48	6	0.75	0.03	YES
3.5 - Design/Applic	2	2	2.86	1.25	1.43	0.49	71	25	YES	5	2	0.94	0.07	YES
3.6 – Personal/Social	4	4	4.12	0.60	2.38	0.48	59	12	YES	6	1	0.92	0.08	YES
Total	45	46.62	64.5	10.57	4.57	4.48	62	18		17	17	0.84	0.11	

Table 3.4
Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers
West Virginia Grade 3 Science—-November 2003
Number of Assessment Items–50

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
3.1 - History/Nature	NO	YES	YES	YES
3.2 - Inquiry	YES	NO	YES	WEAK
3.3 - Unifying Themes	NO	YES	YES	YES
3.4 – Subj Matter/Conc	YES	YES	YES	YES
3.5 - Design/Applic	NO	WEAK	YES	YES
3.6 - Personal/Social	NO	WEAK	YES	YES

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

Item Number	Comments by Reviewer
2	Read a chart.
	The chart gives away the answer because "blue" is the tallest bar
8	Readability—vocabulary—students would not have conceptual knowledge.
	Reading level of stem too high for 3rd graders
	Readability level
	Readability?
	Poor readers at a disability
	Poor readers at a disadvantage
11	Traits are suggestive of heredity in grade 3. May be confusing.
13	Answer has cues that signal student
	Distractor "rings"
	Only the correct answer has the word ring in it. None of the distractors has "rings"

Table 3.5 (continued)
Source-of-Challenge Issues by Reviewer
West Virginia Grade 3 Science—November 2003

Item Number	Comments by Reviewer
13	Student doesn't need knowledge to answer question.
	"Rings" gives answer
19	DOK is affected only by reading/reasoning rather than by science concept
20	Capillary action for 3rd grade?
	There is no evidence to support the change to the blue color
	May not change in one day—several variables
21	Instruments may not be familiar as "tools"
	The student could be looking for a stopwatch rather than a clock
	Beaker vs. graduated cylinder
24	Some students may not have seen an electric can opener.
	Culture?
29	The 2nd choice is an example of free fall which is what the moon is in as it orbits the earth

Table 3.5 (continued)
Source-of-Challenge Issues by Reviewer
West Virginia Grade 3 Science—November 2003

Item Number	Comments by Reviewer
31	Most 3rd graders would lower seat—misleading
	Lowering seat to reach peddle? Oiling?
33	Unfair question—some kids in class never had these
	All answers are loud enough to cause a hearing loss
35	The stem should state that the picture is of the 3 pots at the end of Jan's experiment
	This question gives away the answer to #13
40	Poor wording
	Question is confusing

Table 3.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 3 Science—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	2	2	2	1	2	2	2	2
3	1	1	1	1	1	1	1	1
4	1	2	2	2	2	2	2	1
5	1	1	1	1	1	1	1	1
6	2	2	2	1	2	1	1	1
7	2	3	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1
9	2	2	2	2	3	2	2	2
10	2	2	2	2	2	2	2	2
11	3	2	2	2	2	2	3	1
12	1	2	1	2	1	2	2	2
13	2	2	2	2	2	1	2	2
14	2	2	1	2	1	1	1	1
15	1	2	1	2	1	2	2	1
16	1	2	1	2	1	2	2	1
17	1	2	1	2	2	1	2	1
18	1	1	1	1	1	1	1	1
19	2	2	2	2	2	2	2	1
20	2	2	2	2	3	3	2	2
21	2	2	3	2	2	2	2	2

Table 3.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 3 Science—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	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1
25	2	2	1	2	2	1	2	2
26	1	1	1	1	1	1	1	1
27	1	2	1	1	2	1	1	1
28	1	1	1	1	1	1	1	1
29	1	2	1	2	1	1	1	1
30	2	2	2	2	2	1	2	2
31	2	2	2	1	2	1	1	2
32	2	1	2	2	2	1	1	2
33	1	2	1	1	1	1	1	1
34	1	2	2	2	2	2	2	2
35	1	2	2	2	1	1	1	2
36	1	2	2	2	1	1	1	1
37	1	2	2	1	2	1	2	1
38	1	1	2	1	1	1	1	1
39	1	2	2	2	2	1	2	2
40	2	2	2	2	1	2	2	1
41	1	1	1	1	1	1	1	1

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

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	1	1	2	2	2	2	2	1
43	2	1	2	1	1	1	1	2
44	1	2	2	1	1	1	2	1
45	1	1	2	1	1	2	2	1
46	1	2	2	2	2	1	1	2
47	2	2	2	1	1	2	1	2
48	1	1	2	1	1	2	2	1
49	2	2	2	2	1	1	2	2
50	1	2	2	1	1	2	2	2
Intraclass Corr Grade 3 Science					0.835			

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

Item Number	Comments by Reviewer
2	Read a chart
4	Tough fit
6	3.4.14 has question mark by it
11	Biology
13	Matched the answer with the word in the question
	Bad question
22	3.4.0 has magnetism written above it
	Light, heat, magnetism
	3.4.0 Light, heat, electricity & magnetism
24	3.4.0 has magnetism written above it
31	Reviewer wrote above primary object: position and median (?) of obj
35	Need to put in stem to observe what happened. Better diagram.

Table 3.7(continued)
Notes by Reviewer
West Virginia Grade 3 Science—November 2003

Item Number	Comments by Reviewer
37	Weak match to standard which includes temp. within change of state
39	Beside item number reviewer wrote = Multiple ans.
39	It's not 3.2.7 doesn't answer question or use to make predictions
44	3.4.20 – rocks – not soils
	Poor question
	No match to any earth content standard
	Properties of earth material
45	No match to objects in the sky
	Reviewer wrote above primary object: Obj. in the sky
50	Tough question for 3rd

Table 3.8
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewers
Grade 3 Science—November 2003
West Virginia

Item	DOK	Pobj	S1Obj	DOK	Pobj	S1Obj	S2Obj	DOK	Pobj	S1Obj	S2Obj	DOK	Pobj	S1Obj	DOK	POobj	S1Obj	S2Obj	DOK	POobj	S1Obj	DOK	POobj	S1Obj	DOK	POobj	S1Obj
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		1	3.1.3		1	3.1.3	
2	2	3.2.7		2				2	3.2.7			1	3.2.6		2	3.2.7	3.2.8	3.4.2	2	3.2.7		2	3.2.7		2	3.2.7	3.4.2
3	1	3.1.3		1	3.1.3	3.5.1		1	3.1.3			1	3.1.3	3.5.1	1	3.1.3			1	3.1.3		1	3.1.3		1	3.1.3	
4	1	3.5.1		2	3.6.4	3.6.1		2	3.6.4			2	3.6.4		2	3.6.4			2	3.6.4		2	3.6.4		1	3.6.4	
5	1	3.4.23		1	3.4.23			1	3.4.16			1	3.4.23		1	3.4.23			1	3.4.23		1	3.4.23		1	3.4.23	
6	2	3.4.11		2	3.4.11			2	3.4.13			1	3.4.11		2	3.4.11	3.4.14		1	3.4.11		1	3.4.11		1	3.4.11	
7	2	3.4.4		3	3.4.4			1	3.4.3	3.4.4		1	3.4.4		1	3.4.4			1	3.4.4		1	3.4.4		1	3.3.4	3.4.3
8	1	3.4.18		1	3.4.18			1	3.4.18			1	3.4.18		1	3.4.18	3.3.1		1	3.4.18		1	3.4.18		1	3.1.1	3.4.18
9	2	3.4.4		2	3.2.4	3.4.3		2	3.4.3			2	3.2.4	3.4.4	3	3.2.4	3.4.4		2	3.2.4	3.4.4	2	3.2.4	3.4.4	2	3.2.4	3.4.4
10	2	3.2.7	3.4.4	2	3.2.7	3.4.4	3.4.1	2	3.4.3			2	3.2.7	3.4.4	2	3.4.4	3.2.8	3.2.7	2	3.2.7	3.4.4	2	3.2.7	3.4.4	2	3.1.1	3.4.2
11	3	3.4.2		2	3.2	3.4.2	3.5.2	2	3.4.3	3.4.4		2	3.4.2	3.2	2	3.4.2	3.3.5	3.3.3	2	3.4.2		3	3.2.8	3.2.4	1	3.4.2	
12	1	3.2.7		2	3.2.7			1	3.2.7			2	3.2.7		1	3.2.7			2	3.2.7		2	3.2.7		2	3.2.7	
13	2	3.2	3.1.1	2	3.2	3.1.1		2	3.4.19	3.1.1		2	3.1.1		2	3.1.1			1	3.4.19	3.1.1	2	3.1.1	3.2	2	3.1.1	3.2
14	2	3.2.4		2	3.2.6			1	3.2.4	3.2.6		2	3.2.6		1	3.2.6	3.4.2		1	3.2.6		1	3.2.6		1	3.2.4	
15	1	3.4.16		2	3.4.16			1	3.4.16			2	3.4.16		1	3.4.16			2	3.4.16		2	3.4.16		1	3.4.16	
16	1	3.4.12		2	3.2.6	3.2.4		1	3.2.1			2	3.2.4		1	3.4.12	3.5.2		2	3.4.12		2	3.4.12		1	3.5.2	
17	1	3.4.2		2	3.3.3	3.4.2		1	3.2.7	3.2.8		2	3.2.7		2	3.2.7	3.4.2		1	3.4.2		2	3.2.7	3.3.3	1	3.4.2	
18	1	3.4.10		1	3.4.9	3.4.10		1	3.4.10	3.4.9		1	3.4.9		1	3.4.10	3.4.9		1	3.4.10		1	3.4.10		1	3.4.10	
19	2	3.4.12	3.2.7	2	3.4.2			2	3.2.7			2	3.2.7		2	3.2.7	3.4.12		2	3.2.7		2	3.2.7	3.4.12	1	3.2.7	
20	2	3.4.2		2	3.4.1			2	3.4.1			2	3.3.3	3.4.1	3	3.2.8	3.2.7	3.4.1	3	3.4.1		2	3.4.1		2	3.3.1	3.2.7
21	2	3.2.4	3.4.8	2	3.2.4			3	3.5.2	3.2.4		2	3.2.4		2	3.4.8	3.2.4		2	3.2.4		2	3.2.4		2	3.2.4	3.4.8
22	1	3.4.6	3.4	1	3.4	3.4.6		1	3.4.6	3.4		1	3.4.6		1	3.4.6	3.4		1	3.4	3.4.6	1	3.4.6		1	3.4	3.4.6
23	1	3.4.2		1	3.4.4			1	3.4.2			1	3.4.2		1	3.4.2	3.2.7		1	3.4.2		1	3.4.2		1	3.4.2	
24	1	3.5.1		1	3.4	3.4.6		1	3.5.1			1	3.5.1		1	3.4			1	3.4		1	3.4.6		1	3.3.1	
25	2	3.2.4		2	3.2.4			1	3.2.4			2	3.2.6	3.2.7	2	3.4.6	3.2.7	3.2.4	1	3.2.4		2	3.2.7		2	3.3.1	
26	1	3.4.1		1	3.4.1			1	3.4.1			1	3.4.1		1	3.4.1	3.2.7		1	3.4.1		1	3.4.1		1	3.4.1	
27	1	3.4.18		2	3.4.18			1	3.4.18			1	3.4.18		2	3.4.18	3.4.19		1	3.4.18		1	3.4.18		1	3.4.18	
28	1	3.2.4		1	3.2.4	3.5.1		1	3.2.4			1	3.2.4		1	3.2.4			1	3.2.4		1	3.2.4		1	3.2.4	

Table 3.8 (continued)
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewers
Grade 3 Science—November 2003
West Virginia

Item	DOK	Pobj	S1Obj	DOK	Pobj	S1Obj	S2Obj	DOK	Pobj	S1Obj	S2Obj	DOK	Pobj	S1Obj	DOK	Pobj	S1Obj	S2Obj	DOK	POBj	S1Obj	DOK	POBj	S1Obj	DOK	POBj	S1Obj
29	1	3.4.18		2	3.3.2	3.4.18		1	3.4.18			2	3.3.2	3.4.18	1	3.4.18	3.2.7	3.3.2	1	3.4.18		1	3.4.18	3.3.2	1	3.3.2	3.4.18
30	2	3.4.3		2	3.4.3	3.4.1		2	3.4.3			2	3.4.3		2	3.4.4	3.2.7	3.4.3	1	3.4.3		2	3.4.3		2	3.4.3	
31	2	3.5.1		2	3.5.2			2	3.5.2			1	3.5.2		2	3.4	3.2.7		1	3.4		1	3.4	3.5.2	2	3.5.2	
32	2	3.4.3		1	3.4.3	3.4.1		2	3.4.3			2	3.4.3		2	3.4.3			1	3.4.3		1	3.4.3		2	3.4.3	
33	1	3.6.4		2	3.6.4			1	3.6.4			1	3.6.1		1	3.6.4			1	3.6.4		1	3.6.4		1	3.6.4	
34	1	3.2.8		2	3.2.8			2	3.4.3	3.2.1	3.2.8	2	3.2.8		2	3.2.8	3.4.2		2	3.2.8		2	3.2.8		2	3.2.8	
35	1	3.2.7		2	3.2.7			2	3.2.8	3.2.7		2	3.2.7		1	3.2.8	3.2.7		1	3.4.7		1	3.2.7		2	3.2.7	
36	1	3.3.4		2	3.3.4			2	3.3.4			2	3.3.4		1	3.3.4	3.2.7		1	3.3.4		1	3.3.4		1	3.3.4	
37	1	3.4.7		2	3.3.3	3.2.7		2	3.4.7			1	3.4.7		2	3.4.7			1	3.4.3		2	3.3.3		1	3.3.3	3.4.6
38	1	3.6.3		1	3.6.3			2	3.6.3			1	3.6.3		1	3.6.3	3.6.1		1	3.6.3		1	3.6.3		1	3.6.3	
39	1	3.2.7		2	3.2			2	3.2.7			2	3.2.7		2	3.2.7	3.2.6		1	3.2.7		2	3.2.7		2	3.2.7	
40	2	3.2.1		2	3.2.1			2	3.2.1			2	3.2.1		1	3.4.2	3.3.3		2	3.4.3		2	3.2		1	3.3.3	
41	1	3.2.4		1	3.2.4	3.2.6		1	3.2.6	3.2.4		1	3.2.4		1	3.2.4	3.2.6		1	3.2.7		1	3.2.4		1	3.2.4	
42	1	3.4.16		1	3.2.7	3.4.16		2	3.4.16			2	3.4.16	3.3.3	2	3.4.16	3.2.7	3.4.22	2	3.4.16		2	3.4.16	3.3.3	1	3.3.3	
43	2	3.4.3		1	3.4.3			2	3.4.3			1	3.4.3		1	3.4.4			1	3.4.3		1	3.4.3		2	3.4.3	
44	1	3.4.23		2	3.4	3.3.1		2	3.4.6			1	3.3.1		1	3.4	3.4.20		1	3.4.20		2	3.4.20		1	3.4	
45	1	3.4.19		1	3.3.4			2	3.4.18	3.4.19	3.3.4	1	3.4		1	3.4.19			2	3.4		2	3.4	3.3.4	1	3.4.18	3.3.4
46	1	3.4.4		2	3.4.4			2	3.4.4			2	3.4.4		2	3.4.4	3.2.7		1	3.4.4		1	3.4.4	3.3.2	2	3.2.7	3.4.4
47	2	3.6.3		2	3.6.3			2	3.6.3			1	3.6.3		1	3.6.3			2	3.6.3		1	3.6.3		2	3.6.3	
48	1	3.4.1		1	3.4.1			2	3.4.1			1	3.4.1		1	3.4.1			2	3.4.1		2	3.4.1		1	3.4.1	
49	2	3.2.7		2	3.2.7			2	3.2.7			2	3.2.7		1	3.2.7			1	3.2.7		2	3.2.7		2	3.2.7	
50	1	3.5.1		2	3.4.6	3.5.2		2	3.4.6			1	3.4.6		1	3.4			2	3.4.6		2	3.4.6	3.5.2	2	3.4.6	

Table 3.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 3 Science—November 2003

Low		Medium		High
8		10.32		17

1:	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3									
2:	3.2.6	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.8	3.4.2	3.4.2							
3:	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.5.1	3.5.1							
4:	3.5.1	3.6.1	3.6.4	3.6.4	3.6.4	3.6.4	3.6.4	3.6.4	3.6.4								
5:	3.4.16	3.4.23	3.4.23	3.4.23	3.4.23	3.4.23	3.4.23	3.4.23									
6:	3.4.11	3.4.11	3.4.11	3.4.11	3.4.11	3.4.11	3.4.11	3.4.13	3.4.14								
7:	3.3.4	3.4.3	3.4.3	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4							
8:	3.1.1	3.3.1	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18							
9:	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.4.3	3.4.3	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4			
10:	3.1.1	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.8	3.4.1	3.4.2	3.4.3	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4
11:	3.2	3.2	3.2.4	3.2.8	3.3.3	3.3.5	3.4.2	3.4.2	3.4.2	3.4.2	3.4.2	3.4.2	3.4.3	3.4.4	3.5.2		
12:	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7									
13:	3.1.1	3.1.1	3.1.1	3.1.1	3.1.1	3.1.1	3.1.1	3.1.1	3.2	3.2	3.2	3.2	3.4.19	3.4.19			
14:	3.2.4	3.2.4	3.2.4	3.2.6	3.2.6	3.2.6	3.2.6	3.2.6	3.2.6	3.4.2							
15:	3.4.16	3.4.16	3.4.16	3.4.16	3.4.16	3.4.16	3.4.16	3.4.16									
16:	3.2.1	3.2.4	3.2.4	3.2.6	3.4.12	3.4.12	3.4.12	3.4.12	3.5.2	3.5.2							
17:	3.2.7	3.2.7	3.2.7	3.2.7	3.2.8	3.3.3	3.3.3	3.4.2	3.4.2	3.4.2	3.4.2	3.4.2					
18:	3.4.9	3.4.9	3.4.9	3.4.9	3.4.10	3.4.10	3.4.10	3.4.10	3.4.10	3.4.10	3.4.10						
19:	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.4.2	3.4.12	3.4.12	3.4.12						
20:	3.2.7	3.2.7	3.2.8	3.3.1	3.3.3	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.2					
21:	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.4.8	3.4.8	3.4.8	3.5.2					
22:	3.4	3.4	3.4	3.4	3.4	3.4	3.4.6	3.4.6	3.4.6	3.4.6	3.4.6	3.4.6	3.4.6	3.4.6			
23:	3.2.7	3.4.2	3.4.2	3.4.2	3.4.2	3.4.2	3.4.2	3.4.2	3.4.4								
24:	3.3.1	3.4	3.4	3.4	3.4.6	3.4.6	3.5.1	3.5.1	3.5.1								

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

25:	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.6	3.2.7	3.2.7	3.2.7	3.3.1	3.4.6						
26:	3.2.7	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1								
27:	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18	3.4.19								
28:	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.5.1								
29:	3.2.7	3.3.2	3.3.2	3.3.2	3.3.2	3.3.2	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18	3.4.18			
30:	3.2.7	3.4.1	3.4.3	3.4.3	3.4.3	3.4.3	3.4.3	3.4.3	3.4.3	3.4.3	3.4.4						
31:	3.2.7	3.4	3.4	3.4	3.5.1	3.5.2	3.5.2	3.5.2	3.5.2	3.5.2							
32:	3.4.1	3.4.3	3.4.3	3.4.3	3.4.3	3.4.3	3.4.3	3.4.3	3.4.3								
33:	3.6.1	3.6.4	3.6.4	3.6.4	3.6.4	3.6.4	3.6.4	3.6.4									
34:	3.2.1	3.2.8	3.2.8	3.2.8	3.2.8	3.2.8	3.2.8	3.2.8	3.2.8	3.4.2	3.4.3						
35:	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.8	3.2.8	3.4.7							
36:	3.2.7	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4	3.3.4								
37:	3.2.7	3.3.3	3.3.3	3.3.3	3.4.3	3.4.6	3.4.7	3.4.7	3.4.7	3.4.7							
38:	3.6.1	3.6.3	3.6.3	3.6.3	3.6.3	3.6.3	3.6.3	3.6.3	3.6.3								
39:	3.2	3.2.6	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7								
40:	3.2	3.2.1	3.2.1	3.2.1	3.2.1	3.3.3	3.3.3	3.4.2	3.4.3								
41:	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.4	3.2.6	3.2.6	3.2.6	3.2.7						
42:	3.2.7	3.2.7	3.3.3	3.3.3	3.3.3	3.4.16	3.4.16	3.4.16	3.4.16	3.4.16	3.4.16	3.4.16	3.4.22				
43:	3.4.3	3.4.3	3.4.3	3.4.3	3.4.3	3.4.3	3.4.3	3.4.4									
44:	3.3.1	3.3.1	3.4	3.4	3.4	3.4.6	3.4.20	3.4.20	3.4.20	3.4.23							
45:	3.3.4	3.3.4	3.3.4	3.3.4	3.4	3.4	3.4	3.4.18	3.4.18	3.4.19	3.4.19	3.4.19					
46:	3.2.7	3.2.7	3.3.2	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4	3.4.4						
47:	3.6.3	3.6.3	3.6.3	3.6.3	3.6.3	3.6.3	3.6.3	3.6.3									
48:	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1									
49:	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7	3.2.7									
50:	3.4	3.4.6	3.4.6	3.4.6	3.4.6	3.4.6	3.4.6	3.5.1	3.5.2	3.5.2							

Table 3.10
Items Coded by Reviewers to Each Objective
West Virginia Grade 3 Science—November 2003

Low		Medium		High
0		9.923077		70

root:																																	
3.1:																																	
3.1.1:	8	10	13	13	13	13	13	13	13	13																							
3.1.2:																																	
3.1.3:	1	1	1	1	1	1	1	1	3	3	3	3	3	3	3	3																	
3.2:	11	11	13	13	13	13	39	40																									
3.2.1:	16	34	40	40	40	40																											
3.2.2:																																	
3.2.3:																																	
3.2.4:	9	9	9	9	9	9	11	14	14	14	16	16	21	21	21	21	21	21	21	21	25	25	25	25	25	28	28	28	28	28	28	28	28
	41	41	41	41	41	41	41																										
3.2.5:																																	
3.2.6:	2	14	14	14	14	14	14	16	25	39	41	41	41																				
3.2.7:	2	2	2	2	2	2	10	10	10	10	10	10	12	12	12	12	12	12	12	12	17	17	17	17	19	19	19	19	19	19	19	20	20
	23	25	25	25	26	29	30	31	35	35	35	35	35	35	35	36	37	39	39	39	39	39	39	39	41	42	42	46	46	49	49	49	49
	49	49	49	49																													
3.2.8:	2	10	11	17	20	34	34	34	34	34	34	34	34	35	35																		
3.3:																																	
3.3.1:	8	20	24	25	44	44																											

Table 3.10 (continued)
Items Coded by Reviewers to Each Objective
West Virginia Grade 3 Science—November 2003

3.3.2:	29	29	29	29	29	46																											
3.3.3:	11	17	17	20	37	37	37	40	40	42	42	42																					
3.3.4:	7	36	36	36	36	36	36	36	36	45	45	45	45																				
3.3.5:	11																																
3.4:	22	22	22	22	22	22	24	24	24	31	31	31	44	44	44	45	45	45	50														
3.4.1:	10	20	20	20	20	20	20	26	26	26	26	26	26	26	26	30	32	48	48	48	48	48	48	48	48								
3.4.2:	2	2	10	11	11	11	11	11	11	14	17	17	17	17	17	19	20	23	23	23	23	23	23	23	34	40							
3.4.3:	7	7	9	9	10	11	30	30	30	30	30	30	30	30	32	32	32	32	32	32	32	32	34	37	40	43	43	43	43	43	43	43	
3.4.4:	7	7	7	7	7	7	7	9	9	9	9	9	9	10	10	10	10	10	10	11	23	30	43	46	46	46	46	46	46	46	46		
3.4.5:																																	
3.4.6:	22	22	22	22	22	22	22	22	24	24	25	37	44	50	50	50	50	50	50														
3.4.7:	35	37	37	37	37																												
3.4.8:	21	21	21																														
3.4.9:	18	18	18	18																													
3.4.10:	18	18	18	18	18	18	18																										
3.4.11:	6	6	6	6	6	6	6																										
3.4.12:	16	16	16	16	19	19	19																										
3.4.13:	6																																
3.4.14:	6																																
3.4.15:																																	
3.4.16:	5	15	15	15	15	15	15	15	15	42	42	42	42	42	42	42																	
3.4.17:																																	
3.4.18:	8	8	8	8	8	8	8	8	27	27	27	27	27	27	27	27	29	29	29	29	29	29	29	29	45	45							

Table 3.10 (continued)
Items Coded by Reviewers to Each Objective
West Virginia Grade 3 Science—November 2003

3.4.19:	13	13	27	45	45	45																											
3.4.20:	44	44	44																														
3.4.21:																																	
3.4.22:	42																																
3.4.23:	5	5	5	5	5	5	5	44																									
3.5:																																	
3.5.1:	3	3	4	24	24	24	28	31	50																								
3.5.2:	11	16	16	21	31	31	31	31	31	50	50																						
3.6:																																	
3.6.1:	4	33	38																														
3.6.2:																																	
3.6.3:	38	38	38	38	38	38	38	38	47	47	47	47	47	47	47	47																	
3.6.4:	4	4	4	4	4	4	4	33	33	33	33	33	33	33																			

Table 3.11
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 3 Science—November 2003

Agreement Report

One Reviewer		50 % of Reviewers		All Reviewers
1		4		8

root:																			
3.1:																			
3.1.1:	8:1	10:1	13:8																
3.1.2:																			
3.1.3:	1:8	3:8																	
3.2:	11:2	13:4	39:1	40:1															
3.2.1:	16:1	34:1	40:4																
3.2.2:																			
3.2.3:																			
3.2.4:	9:6	11:1	14:3	16:2	21:8	25:5	28:8	41:7											
3.2.5:																			
3.2.6:	2:1	14:6	16:1	25:1	39:1	41:3													
3.2.7:	2:6	10:6	12:8	17:4	19:7	20:2	23:1	25:3	26:1	29:1	30:1	31:1	35:7	36:1	37:1	39:7	41:1	42:2	46:2	49:8
3.2.8:	2:1	10:1	11:1	17:1	20:1	34:8	35:2													
3.3:																				
3.3.1:	8:1	20:1	24:1	25:1	44:2															
3.3.2:	29:5	46:1																		
3.3.3:	11:1	17:2	20:1	37:3	40:2	42:3														
3.3.4:	7:1	36:8	45:4																	
3.3.5:	11:1																			

Table 3.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 3 Science—November 2003

3.4:	22:6	24:3	31:3	44:3	45:3	50:1														
3.4.1:	10:1	20:6	26:8	30:1	32:1	48:8														
3.4.2:	2:2	10:1	11:6	14:1	17:5	19:1	20:1	23:7	34:1	40:1										
3.4.3:	7:2	9:2	10:1	11:1	30:8	32:8	34:1	37:1	40:1	43:7										
3.4.4:	7:7	9:6	10:6	11:1	23:1	30:1	43:1	46:8												
3.4.5:																				
3.4.6:	22:8	24:2	25:1	37:1	44:1	50:6														
3.4.7:	35:1	37:4																		
3.4.8:	21:3																			
3.4.9:	18:4																			
3.4.10:	18:7																			
3.4.11:	6:7																			
3.4.12:	16:4	19:3																		
3.4.13:	6:1																			
3.4.14:	6:1																			
3.4.15:																				
3.4.16:	5:1	15:8	42:7																	
3.4.17:																				
3.4.18:	8:8	27:8	29:8	45:2																
3.4.19:	13:2	27:1	45:3																	
3.4.20:	44:3																			
3.4.21:																				
3.4.22:	42:1																			
3.4.23:	5:7	44:1																		

Table 3.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 3 Science—November 2003

3.5:																					
3.5.1:	3:2	4:1	24:3	28:1	31:1	50:1															
3.5.2:	11:1	16:2	21:1	31:5	50:2																
3.6:																					
3.6.1:	4:1	33:1	38:1																		
3.6.2:																					
3.6.3:	38:8	47:8																			
3.6.4:	4:7	33:7																			

Table 4.1
Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 4 Science—November 2003
Number of Assessment Items–30

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 - History/Nature	3	3.38	1	3	100	4.62	0.48	NO
4.2 - Inquiry	10	10.38	1 2 3	3 2 5	30 20 50	12.62	4.06	YES
4.3 - Unifying Themes	5	5.12	1 2	1 4	20 80	2.5	1.58	NO
4.4 - Subj Matter/Conc	35	36	1 2	11 24	31 68	28.75	3.49	YES
4.5 - Design/Applic	2	2.12	2 3	1 1	50 50	2	1	NO
4.6 - Personal/Social	4	4.25	2 3	3 1	75 25	6	1.22	YES
Total	59	61.25	1 2 3	18 34 7	30 57 11	56.5	6.80	

Table 4.2
Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 4 Science—November 2003
Number of Assessment Items–50

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 - History/Nature	3	3.38	4.62	0.48	0	0	88	27	12	27	YES
4.2 – Inquiry	10	10.38	12.62	4.06	60	48	29	42	11	28	WEAK
4.3 - Unifying Themes	5	5.12	2.5	1.58	50	47	36	44	14	35	YES
4.4 – Subj Matter/Concepts	35	36	28.75	3.49	37	43	57	44	7	24	YES
4.5 - Design/Application	2	2.12	2	1	75	43	25	43	0	0	NO
4.6 - Personal/Social	4	4.25	6	1.22	69	34	31	34	0	0	NO
Total	59	61.25	56.5	6.80	43	46	49	45	7	25	

Table 4.3
Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 4 Science—November 2003
Number of Assessment Items–50

Standards			Hits		Range of Objectives				Rng. of Know.	Balance Index				Bal. of Represent.
					# Objs Hit		% of Total			% Hits in Std/Ttl Hits		Index		
Title	Goals #	Objs #	Mean	S.D.	Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.	
4.1 - History/Nature	3	3.38	4.62	0.48	2.5	0.5	74	11	YES	8	1	0.87	0.07	YES
4.2 - Inquiry	10	10.38	12.62	4.06	5.62	1.73	54	15	YES	22	5	0.76	0.06	YES
4.3 - Unifying Themes	5	5.12	2.5	1.58	1.75	0.97	35	20	NO	4	3	0.97	0.06	YES
4.4 – Subj Matter/Conc	35	36	28.75	3.49	18.5	2.12	51	6	YES	51	6	0.75	0.03	YES
4.5 - Design/Applic	2	2.12	2	1	1.5	0.5	71	23	YES	4	2	0.95	0.09	YES
4.6 - Personal/Social	4	4.25	6	1.22	2.88	0.60	68	11	YES	11	1	0.82	0.10	YES
Total	59	61.25	56.5	6.80	5.46	6.11	59	21		17	17	0.85	0.11	

Table 4.4
Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers
West Virginia Grade 4 Science—November 2003
Number of Assessment Items–50

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
4.1 - History/Nature	NO	YES	YES	YES
4.2 - Inquiry	YES	WEAK	YES	YES
4.3 - Unifying Themes	NO	YES	NO	YES
4.4 – Subj Matter/Conc	YES	YES	YES	YES
4.5 - Design/Applic	NO	NO	YES	YES
4.6 - Personal/Social	YES	NO	YES	YES

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

Item Number	Comments by Reviewer
9	Answer #2 Clear cutting a fire break could be helping the environment
19	All of the choices are important
21	Length of correct answer could cue students to it
30	Possible answers ambiguous
35	Is geography of U.S. part of science?
40	Wording could be confusing

Table 4.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 4 Science—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	2	1	1	1	2
3	1	1	3	1	1	1	1	1
4	1	2	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	1	1	2	1	1	1
8	1	2	2	2	2	2	2	1
9	1	1	2	2	1	1	1	1
10	1	1	2	2	1	2	2	1
11	1	2	1	1	1	1	2	1
12	1	1	1	1	1	1	1	1
13	1	1	1	2	1	1	1	1
14	1	2	2	2	1	2	2	1
15	1	1	1	2	2	1	2	2
16	1	1	1	1	2	2	1	1
17	2	1	2	1	1	2	2	1
18	1	1	1	1	1	1	1	1
19	1	2	1	2	1	2	1	1
20	1	1	2	1	2	3	1	1
21	1	2	2	2	2	2	2	1

Table 4.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 4 Science—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	1	2	2
23	1	2	2	2	1	2	1	1
24	1	1	1	2	2	1	2	1
25	1	1	2	1	1	1	1	1
26	1	1	2	1	2	2	1	1
27	2	2	1	2	1	1	2	1
28	2	1	2	1	1	2	1	2
29	1	1	2	2	2	1	2	1
30	2	2	2	2	2	2	2	2
31	1	1	1	1	1	1	1	1
32	2	2	2	2	2	2	2	2
33	1	1	1	2	1	2	1	1
34	1	1	2	2	2	2	1	2
35	1	2	1	2	2	1	2	2
36	2	2	2	2	2	2	2	2
37	1	2	2	1	2	1	2	2
38	1	2	2	1	1	1	1	1
39	1	1	2	1	2	2	1	2
40	2	2	2	1	1	2	2	1
41	1	1	2	1	2	1	1	2

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

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	2	2	1	2	2	2	2	1
43	1	2	1	1	2	2	2	2
44	1	1	1	2	1	1	1	1
45	1	1	1	1	1	2	1	1
46	1	2	2	2	2	2	2	2
47	1	1	1	1	1	2	1	1
48	1	1	2	1	2	1	1	1
49	1	2	1	2	1	1	2	2
50	3	2	2	2	2	2	2	2
Intraclass Corr Grade 4 Science					0.734			

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

Item Number	Comments by Reviewer
6	Force fit—couldn't find better objective listed
	No good match
	Weak match
7	Weak match
	Question this match
11	Closest match to objects in sky
	Objects in the sky
12	Objects in the sky
	Closest match to objects in sky
	Why not 4.4.32? Item not specifically about orbital paths
13	Really stretching 4.2.6; fossil evidence (different grade level)
	Closest match to objects in sky
	Prop. of earth materials

Table 4.7(continued)
Notes by Reviewer
West Virginia Grade 4 Science—November 2003

Item Number	Comments by Reviewer
13	(Reviewer wrote in primary object: changes in Earth's sky)
15	Not interpreting, just reading graph values—does Earth have an ecosystem? (should be biosphere?)
19	(Reviewer put question mark in notes)
20	Light, heat . . .
22	Weak match to stand.
23	Properties of obj.
	Tough fit
28	Objects in the sky
29	Not of a liquid (density)
32	(Reviewer put in primary object: charact. of org.)
	But item is not about behavior

Table 4.7(continued)
Notes by Reviewer
West Virginia Grade 4 Science—November 2003

Item Number	Comments by Reviewer
32	No match to characteristics of organism or envir. standard
	Characteristics of organisms
	Misleading answers—dark/cold
33	Characteristic of organisms
	Item is about geographic barrier rather than environmental barrier
37	Topic match
38	Better match to a 3rd grade standard or rocks and minerals
39	Rubric?

Table 4.8
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewers
Grade 4 Science—November 2003
West Virginia

Item	DOK	Pobj	DOK	Pobj	S1Obj	DOK	Pobj	S1Obj	DOK	Pobj	S1Obj	DOK	POobj	S1Obj	DOK	POobj	S1Obj	DOK	POobj	S1Obj	DOK	POobj	S1Obj
1	1	4.4.3	1	4.4.3	4.3.4	1	4.4.1		1	4.3.4		1	4.3.4	4.4	1	4.3.4		1	4.4.3		1	4.3.4	
2	1	4.6.4	2	4.6.4		1	4.6.1	4.6.4	2	4.6.4		1	4.6.4	4.6.1	1	4.6.4		1	4.6.4		2	4.6.4	
3	1	4.4.6	1	4.4.6		3	4.4.6		1	4.3.4		1	4.3.4		1	4.4.6		1	4.4		1	4.3.4	
4	1	4.4.4	2	4.4.4		1	4.4.4		1	4.4.4		1	4.4.4		1	4.4.4		1	4.4.4		1	4.4	
5	1	4.4.3	1	4.4.3		1	4.4.1	4.4.3	1	4.4.3		1	4.4.3	4.2.8	1	4.4.1		1	4.4.3		1	4.4.1	
6	1	4.6.3	1	4.5.2		1	4.6.3		1	4.5.2		1	4.6.3		1	4.6.3		1	4.5.2		1	4.5.2	
7	1	4.1	1	4.1.1		1	4.1.1	4.6.3	1	4.1.1		2	4.6	4.1.2	1	4.1.1		1	4.1.1		1	4.1.1	
8	1	4.4.18	2	4.4.18	4.4.19	2	4.4.18		2	4.4.19	4.3.1	2	4.4.18	4.4.19	2	4.4.19	4.4.18	2	4.4.19	4.4.18	1	4.4.19	
9	1	4.6.4	1	4.6.4		2	4.6.4		2	4.6.4		1	4.6.4		1	4.6.4		1	4.6.4		1	4.6.4	
10	1	4.4.3	1	4.4.2		2	4.4.1		2	4.4.1		1	4.4.2		2	4.4.1		2	4.4.3		1	4.4.2	
11	1	4.4.30	2	4.4		1	4.4.30		1	4.4		1	4.4.30		1	4.4		2	4.4.30		1	4.4	
12	1	4.4	1	4.4		1	4.4.31	4.4	1	4.4		1	4.4		1	4.4.3		1	4.4.32		1	4.4	
13	1	4.4.25	1	4.2.6		1	4.4.25		2	4.4		1	4.3.3		1	4.2.6		1	4.4		1	4.4	
14	1	4.2.4	2	4.2.3		2	4.2.1		2	4.2.4		1	4.2.4		2	4.2.4		2	4.4.13	4.2.4	1	4.2.4	
15	1	4.2.8	1	4.2		1	4.2.8		2	4.2.8		2	4.2.8		1	4.2.8		2	4.2.8		2	4.2.8	
16	1	4.4.13	1	4.4.14		1	4.4.13		1	4.4.14		2	4.4.14	4.4.13	2	4.4.13		1	4.4.13		1	4.4.14	
17	2	4.6.4	1	4.6.4		2	4.4.1		1	4.6.4		1	4.6.4	4.4.8	2	4.4	4.3.1	2	4.6.4		1	4.6.4	
18	1	4.1.3	1	4.1.3		1	4.1.3		1	4.1.3		1	4.1.3		1	4.1.3		1	4.1		1	4.1	
19	1	4.5.1	2	4.5.2		1	4.2.2		2	4.5.2		1	4.5.1	4.5.2	2	4.5.1		1	4.5.1		1	4.5.2	
20	1	4.4.16	1	4.5.2		2	4.4.23	4.4.17	1	4.4.16		2	4.4.16		3	4.4.23		1	4.4.16		1	4.4	
21	1	4.4.15	2	4.4.15		2	4.4.15		2	4.2.8	4.4.15	2	4.4.15		2	4.4.15		2	4.2.7		1	4.4.10	
22	1	4.4.8	2	4.4.8		2	4.4.2	4.4.8	2	4.4.8		2	4.4.8	4.4.2	1	4.4.2		2	4.4.2		2	4.4.2	
23	1	4.3.2	2	4.3.2		2	4.4.28		2	4.3.2	4.4.28	1	4.4.28		2	4.4.28		1	4.4.28		1	4.4	
24	1	4.4.1	1	4.4.1		1	4.4.1		2	4.4.1		2	4.4.1		1	4.4.1		2	4.4.1		1	4.4.1	
25	1	4.4.8	1	4.4.8		2	4.4.8		1	4.4.8		1	4.4.4		1	4.4.8		1	4.4.8		1	4.4.8	
26	1	4.1.1	1	4.1.1		2	4.1.1		1	4.4.1		2	4.4		2	4.4.1		1	4.1.1		1	4.1.1	
27	2	4.4.4	2	4.4.4		1	4.4.1		2	4.4.4		1	4.4.4	4.2.8	1	4.4.8	4.6.4	2	4.4.4		1	4.4.4	

Table 4.8 (continued)
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewers
Grade 4 Science—November 2003
West Virginia

Item	DOK	Pobj	DOK	Pobj	S1Obj	DOK	Pobj	S1Obj	DOK	Pobj	S1Obj	DOK	POBj	S1Obj	DOK	POBj	S1Obj	DOK	POBj	S1Obj	DOK	POBj	S1Obj
28	2	4.4	1	4.2.9		2	4.4		1	4.1.1		1	4.4		2	4.1.1		1	4.1	4.2.1	2	4.3.4	
29	1	4.4.15	1	4.4.15		2	4.4.15		2	4.2.8		2	4.4.9		1	4.4.15		2	4.4.15		1	4.4.15	
30	2	4.2.7	2	4.2.6		2	4.2.6	4.2.1	2	4.2.7		2	4.2.6		2	4.2.2		2	4.2		2	4.2.6	
31	1	4.4.30	1	4.4.30		1	4.4.30		1	4.4.30		1	4.4.30		1	4.4.30		1	4.4.30		1	4.4.30	
32	2	4.4.2	2	4.4		2	4.4		2	4.4		2	4.4	4.3.3	2			2	4.4		2	4.4	
33	1	4.4.7	1	4.4.7		1	4.4		2	4.4.7		1	4.4.7		2	4.4.7		1	4.4.7		1	4.4.2	
34	1	4.2.4	1	4.2.4		2	4.2.4		2	4.2.4	4.5.1	2	4.2.4		2	4.2.4		1	4.2.4		2	4.2.4	
35	1	4.4.29	2	4.2.8		1	4.2.8		2	4.2.8		2	4.2.9	4.2.8	1	4.4.29		2	4.4.29		2	4.4.29	
36	2	4.4.8	2	4.4.8		2	4.4.8		2	4.4.8		2	4.4.8	4.2.8	2	4.4.8		2	4.4.8		2	4.4.8	
37	1	4.2.4	2	4.5		2	4.2.10	4.5.1	1	4.2.10		2	4.2.10	4.2.4	1	4.4.15		2	4.2		2	4.2.4	
38	1	4.4.9	2	4.4.9		2	4.4.9		1	4.4		1	4.4		1	4.4.9		1	4.4.9		1	4.4.9	
39	1	4.6.3	1	4.6.3		2	4.6.3	4.6.1	1	4.6.3		2	4.6.3		2	4.6.3		1	4.6.3		2	4.6.3	
40	2	4.4.12	2	4.4.12		2	4.2	4.4.12	1	4.4.12		1	4.4.12		2	4.4.12		2	4.4.12		1	4.4.12	
41	1	4.4.10	1	4.2.8		2	4.4.10	4.2.1	1	4.2.8		2	4.4.10	4.2.8	1	4.4.10		1	4.4.10		2	4.4.10	
42	2	4.4.33	2	4.4.27		1	4.4.33	4.3	2	4.3.3		2	4.3.3	4.4.33	2	4.4.3		2	4.4.27		1	4.4.25	
43	1	4.2.7	2	4.2.7		1	4.2.1	4.2.7	1	4.2.7		2	4.4.24		2	4.4.2		2	4.2.7		2	4.2.6	4.4.17
44	1	4.1.3	1	4.1.3		1	4.1.3		2	4.1.3		1	4.1.3		1	4.1.3		1	4.1.3		1	4.1.3	
45	1	4.2.4	1	4.2.4		1	4.2.4	4.1.1	1	4.1.1		1	4.1.1	4.2.4	2	4.1.1		1	4.2.4		1	4.1.1	
46	1	4.2.6	2	4.2.6		2	4.2.6		2	4.2.6		2	4.2.6		2	4.4		2	4.2.6		2	4.4.13	4.2.6
47	1	4.6.3	1	4.6.1		1	4.6.1		1	4.6.1		1	4.6.1		2	4.6.1		1	4.6		1	4.6.4	
48	1	4.2.8	1	4.2.8		2	4.4.27	4.2.8	1	4.2.8		2	4.4.27	4.2.8	1	4.2.8		1	4.2.8		1	4.4.27	
49	1	4.4.29	2	4.2.8	4.2.9	1	4.2.9	4.2.8	2	4.4.29		1	4.2.9		1	4.2.9		2	4.4.29	4.3.2	2	4.4.29	
50	3	4.2.8	2	4.2.8	4.2.9	2	4.4.1	4.2.1	2	4.2.8	4.4.10	2	4.2.6	4.2.7	2	4.2.8		2			2	4.4.10	

Table 4.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 4 Science—November 2003

Low		Medium		High
8		9.04		13

1:	4.3.4	4.3.4	4.3.4	4.3.4	4.3.4	4.4	4.4.1	4.4.3	4.4.3	4.4.3			
2:	4.6.1	4.6.1	4.6.4	4.6.4	4.6.4	4.6.4	4.6.4	4.6.4	4.6.4	4.6.4			
3:	4.3.4	4.3.4	4.3.4	4.4	4.4.6	4.4.6	4.4.6	4.4.6					
4:	4.4	4.4.4	4.4.4	4.4.4	4.4.4	4.4.4	4.4.4	4.4.4					
5:	4.2.8	4.4.1	4.4.1	4.4.1	4.4.3	4.4.3	4.4.3	4.4.3	4.4.3	4.4.3			
6:	4.5.2	4.5.2	4.5.2	4.5.2	4.6.3	4.6.3	4.6.3	4.6.3					
7:	4.1	4.1.1	4.1.1	4.1.1	4.1.1	4.1.1	4.1.1	4.1.2	4.6	4.6.3			
8:	4.3.1	4.4.18	4.4.18	4.4.18	4.4.18	4.4.18	4.4.18	4.4.19	4.4.19	4.4.19	4.4.19	4.4.19	4.4.19
9:	4.6.4	4.6.4	4.6.4	4.6.4	4.6.4	4.6.4	4.6.4	4.6.4					
10:	4.4.1	4.4.1	4.4.1	4.4.2	4.4.2	4.4.2	4.4.3	4.4.3					
11:	4.4	4.4	4.4	4.4	4.4.30	4.4.30	4.4.30	4.4.30					
12:	4.4	4.4	4.4	4.4	4.4	4.4	4.4.3	4.4.31	4.4.32				
13:	4.2.6	4.2.6	4.3.3	4.4	4.4	4.4	4.4.25	4.4.25					
14:	4.2.1	4.2.3	4.2.4	4.2.4	4.2.4	4.2.4	4.2.4	4.2.4	4.4.13				
15:	4.2	4.2.8	4.2.8	4.2.8	4.2.8	4.2.8	4.2.8	4.2.8					
16:	4.4.13	4.4.13	4.4.13	4.4.13	4.4.13	4.4.14	4.4.14	4.4.14	4.4.14				
17:	4.3.1	4.4	4.4.1	4.4.8	4.6.4	4.6.4	4.6.4	4.6.4	4.6.4	4.6.4			
18:	4.1	4.1	4.1.3	4.1.3	4.1.3	4.1.3	4.1.3	4.1.3					
19:	4.2.2	4.5.1	4.5.1	4.5.1	4.5.1	4.5.2	4.5.2	4.5.2	4.5.2				
20:	4.4	4.4.16	4.4.16	4.4.16	4.4.16	4.4.17	4.4.23	4.4.23	4.5.2				
21:	4.2.7	4.2.8	4.4.10	4.4.15	4.4.15	4.4.15	4.4.15	4.4.15	4.4.15				

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

22:	4.4.2	4.4.2	4.4.2	4.4.2	4.4.2	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8
23:	4.3.2	4.3.2	4.3.2	4.4	4.4.28	4.4.28	4.4.28	4.4.28	4.4.28	
24:	4.4.1	4.4.1	4.4.1	4.4.1	4.4.1	4.4.1	4.4.1	4.4.1		
25:	4.4.4	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8		
26:	4.1.1	4.1.1	4.1.1	4.1.1	4.1.1	4.4	4.4.1	4.4.1		
27:	4.2.8	4.4.1	4.4.4	4.4.4	4.4.4	4.4.4	4.4.4	4.4.4	4.4.8	4.6.4
28:	4.1	4.1.1	4.1.1	4.2.1	4.2.9	4.3.4	4.4	4.4	4.4	
29:	4.2.8	4.4.9	4.4.15	4.4.15	4.4.15	4.4.15	4.4.15	4.4.15		
30:	4.2	4.2.1	4.2.2	4.2.6	4.2.6	4.2.6	4.2.6	4.2.7	4.2.7	
31:	4.4.30	4.4.30	4.4.30	4.4.30	4.4.30	4.4.30	4.4.30	4.4.30		
32:	4.3.3	4.4	4.4	4.4	4.4	4.4	4.4	4.4.2		
33:	4.4	4.4.2	4.4.7	4.4.7	4.4.7	4.4.7	4.4.7	4.4.7		
34:	4.2.4	4.2.4	4.2.4	4.2.4	4.2.4	4.2.4	4.2.4	4.2.4	4.5.1	
35:	4.2.8	4.2.8	4.2.8	4.2.8	4.2.9	4.4.29	4.4.29	4.4.29	4.4.29	
36:	4.2.8	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8	4.4.8	
37:	4.2	4.2.4	4.2.4	4.2.4	4.2.10	4.2.10	4.2.10	4.4.15	4.5	4.5.1
38:	4.4	4.4	4.4.9	4.4.9	4.4.9	4.4.9	4.4.9	4.4.9		
39:	4.6.1	4.6.3	4.6.3	4.6.3	4.6.3	4.6.3	4.6.3	4.6.3	4.6.3	
40:	4.2	4.4.12	4.4.12	4.4.12	4.4.12	4.4.12	4.4.12	4.4.12	4.4.12	
41:	4.2.1	4.2.8	4.2.8	4.2.8	4.4.10	4.4.10	4.4.10	4.4.10	4.4.10	4.4.10
42:	4.3	4.3.3	4.3.3	4.4.3	4.4.25	4.4.27	4.4.27	4.4.33	4.4.33	4.4.33
43:	4.2.1	4.2.6	4.2.7	4.2.7	4.2.7	4.2.7	4.2.7	4.4.2	4.4.17	4.4.24
44:	4.1.3	4.1.3	4.1.3	4.1.3	4.1.3	4.1.3	4.1.3	4.1.3		
45:	4.1.1	4.1.1	4.1.1	4.1.1	4.1.1	4.2.4	4.2.4	4.2.4	4.2.4	4.2.4

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

46:	4.2.6	4.2.6	4.2.6	4.2.6	4.2.6	4.2.6	4.2.6	4.4	4.4.13		
47:	4.6	4.6.1	4.6.1	4.6.1	4.6.1	4.6.1	4.6.3	4.6.4			
48:	4.2.8	4.2.8	4.2.8	4.2.8	4.2.8	4.2.8	4.2.8	4.4.27	4.4.27	4.4.27	
49:	4.2.8	4.2.8	4.2.9	4.2.9	4.2.9	4.2.9	4.3.2	4.4.29	4.4.29	4.4.29	4.4.29
50:	4.2.1	4.2.6	4.2.7	4.2.8	4.2.8	4.2.8	4.2.8	4.2.9	4.4.1	4.4.10	4.4.10

Table 4.10

Items Coded by Reviewers to Each Objective

West Virginia Grade 4 Science—November 2003

Low		Medium		High
0		6.848485		33

root:																																
4.1:	7	18	18	28																												
4.1.1:	7	7	7	7	7	7	26	26	26	26	26	28	28	45	45	45	45	45														
4.1.2:	7																															
4.1.3:	18	18	18	18	18	18	44	44	44	44	44	44	44	44																		
4.2:	15	30	37	40																												
4.2.1:	14	28	30	41	43	50																										
4.2.2:	19	30																														
4.2.3:	14																															
4.2.4:	14	14	14	14	14	14	34	34	34	34	34	34	34	34	37	37	37	45	45	45	45	45										
4.2.5:																																
4.2.6:	13	13	30	30	30	30	43	46	46	46	46	46	46	46	50																	
4.2.7:	21	30	30	43	43	43	43	43	50																							
4.2.8:	5	15	15	15	15	15	15	15	21	27	29	35	35	35	35	36	41	41	41	48	48	48	48	48	48	48	49	49	50	50	50	50
4.2.9:	28	35	49	49	49	49	50																									
4.2.10:	37	37	37																													
4.3:	42																															
4.3.1:	8	17																														
4.3.2:	23	23	23	49																												
4.3.3:	13	32	42	42																												

Table 4.10 (continued)

Items Coded by Reviewers to Each Objective

West Virginia Grade 4 Science—November 2003

4.3.4:	1	1	1	1	1	3	3	3	28																								
4.3.5:																																	
4.4:	1	3	4	11	11	11	11	12	12	12	12	12	12	13	13	13	17	20	23	26	28	28	28	32	32	32	32	32	32	33	38	38	46
4.4.1:	1	5	5	5	10	10	10	17	24	24	24	24	24	24	24	24	26	26	27	50													
4.4.2:	10	10	10	22	22	22	22	22	32	33	43																						
4.4.3:	1	1	1	5	5	5	5	5	5	10	10	12	42																				
4.4.4:	4	4	4	4	4	4	4	25	27	27	27	27	27	27																			
4.4.5:																																	
4.4.6:	3	3	3	3																													
4.4.7:	33	33	33	33	33	33																											
4.4.8:	17	22	22	22	22	22	25	25	25	25	25	25	25	27	36	36	36	36	36	36	36	36											
4.4.9:	29	38	38	38	38	38	38																										
4.4.10:	21	41	41	41	41	41	41	50	50																								
4.4.11:																																	
4.4.12:	40	40	40	40	40	40	40	40																									
4.4.13:	14	16	16	16	16	16	46																										
4.4.14:	16	16	16	16																													
4.4.15:	21	21	21	21	21	21	29	29	29	29	29	29	37																				
4.4.16:	20	20	20	20																													
4.4.17:	20	43																															
4.4.18:	8	8	8	8	8	8																											
4.4.19:	8	8	8	8	8	8																											
4.4.20:																																	

Table 4.10 (continued)
Items Coded by Reviewers to Each Objective
West Virginia Grade 4 Science—November 2003

4.4.21:																								
4.4.22:																								
4.4.23:	20	20																						
4.4.24:	43																							
4.4.25:	13	13	42																					
4.4.26:																								
4.4.27:	42	42	48	48	48																			
4.4.28:	23	23	23	23	23																			
4.4.29:	35	35	35	35	49	49	49	49																
4.4.30:	11	11	11	11	31	31	31	31	31	31	31	31												
4.4.31:	12																							
4.4.32:	12																							
4.4.33:	42	42	42																					
4.4.34:																								
4.4.35:																								
4.5:	37																							
4.5.1:	19	19	19	19	34	37																		
4.5.2:	6	6	6	6	19	19	19	19	20															
4.6:	7	47																						
4.6.1:	2	2	39	47	47	47	47	47																
4.6.2:																								
4.6.3:	6	6	6	6	7	39	39	39	39	39	39	39	39	47										
4.6.4:	2	2	2	2	2	2	2	2	9	9	9	9	9	9	9	9	17	17	17	17	17	17	27	47

Table 4.11
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 4 Science—November 2003

One Reviewer		50 % of Reviewers		All Reviewers
1		4		8

root:												
4.1:	7:1	18:2	28:1									
4.1.1:	7:6	26:5	28:2	45:5								
4.1.2:	7:1											
4.1.3:	18:6	44:8										
4.2:	15:1	30:1	37:1	40:1								
4.2.1:	14:1	28:1	30:1	41:1	43:1	50:1						
4.2.2:	19:1	30:1										
4.2.3:	14:1											
4.2.4:	14:6	34:8	37:3	45:5								
4.2.5:												
4.2.6:	13:2	30:4	43:1	46:7	50:1							
4.2.7:	21:1	30:2	43:5	50:1								
4.2.8:	5:1	15:7	21:1	27:1	29:1	35:4	36:1	41:3	48:7	49:2	50:4	
4.2.9:	28:1	35:1	49:4	50:1								
4.2.10:	37:3											
4.3:	42:1											
4.3.1:	8:1	17:1										
4.3.2:	23:3	49:1										
4.3.3:	13:1	32:1	42:2									
4.3.4:	1:5	3:3	28:1									

Table 4.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 4 Science—November 2003

4.3.5:															
4.4:	1:1	3:1	4:1	11:4	12:6	13:3	17:1	20:1	23:1	26:1	28:3	32:6	33:1	38:2	46:1
4.4.1:	1:1	5:3	10:3	17:1	24:8	26:2	27:1	50:1							
4.4.2:	10:3	22:5	32:1	33:1	43:1										
4.4.3:	1:3	5:6	10:2	12:1	42:1										
4.4.4:	4:7	25:1	27:6												
4.4.5:															
4.4.6:	3:4														
4.4.7:	33:6														
4.4.8:	17:1	22:5	25:7	27:1	36:8										
4.4.9:	29:1	38:6													
4.4.10:	21:1	41:6	50:2												
4.4.11:															
4.4.12:	40:8														
4.4.13:	14:1	16:5	46:1												
4.4.14:	16:4														
4.4.15:	21:6	29:6	37:1												
4.4.16:	20:4														
4.4.17:	20:1	43:1													
4.4.18:	8:6														
4.4.19:	8:6														
4.4.20:															
4.4.21:															
4.4.22:															

Table 4.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 4 Science—November 2003

4.4.23:	20:2				
4.4.24:	43:1				
4.4.25:	13:2	42:1			
4.4.26:					
4.4.27:	42:2	48:3			
4.4.28:	23:5				
4.4.29:	35:4	49:4			
4.4.30:	11:4	31:8			
4.4.31:	12:1				
4.4.32:	12:1				
4.4.33:	42:3				
4.4.34:					
4.4.35:					
4.5:	37:1				
4.5.1:	19:4	34:1	37:1		
4.5.2:	6:4	19:4	20:1		
4.6:	7:1	47:1			
4.6.1:	2:2	39:1	47:5		
4.6.2:					
4.6.3:	6:4	7:1	39:8	47:1	
4.6.4:	2:8	9:8	17:6	27:1	47:1

Table 5.1
Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 5 Science—November 2003
Number of Assessment Items–50

Standards			Level by Objective			Hits		Cat. Concurr.
Title	Goals #	Objs #	Level	# of objs by Level	% w/in std by Level	Mean	S.D.	
5.1 - History/Nature	4	4.12	1	4	100	1.75	0.66	NO
5.2 - Inquiry	8	8.88	1 2 3	2 1 5	25 12 62	13.5	4.56	YES
5.3 - Unifying Themes	4	4.12	2	4	100	4.29	1.91	NO
5.4 - Subj Matter/Conc	25	25.88	1 2	9 16	36 64	28.38	2.55	YES
5.5 - Design/Applic	2	2.12	2 3	1 1	50 50	4.12	2.37	NO
5.6 - Personal/Social	5	5.25	2 3	2 3	40 60	5.12	1.36	NO
Total	48	50.38	1 2 3	15 24 9	31 50 18	56.62	8.59	

Table 5.2
Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 5 Science—November 2003
Number of Assessment Items–50

Standards			Hits		Level of Item w.r.t. Standard						DOK Consistency
					% Under		% At		% Above		
Title	Goals #	Objs #	M	S.D.	M	S.D.	M	S.D.	M	S.D.	
5.1 - History/Nature	4	4.12	1.75	0.66	0	0	38	49	62	49	YES
5.2 - Inquiry	8	8.88	13.5	4.56	65	45	29	41	5	18	NO
5.3 - Unifying Themes	4	4.12	4.29	1.91	26	41	61	46	12	31	YES
5.4 - Subj Matter/Concepts	25	25.88	28.38	2.55	44	45	47	44	9	26	YES
5.5 - Design/Application	2	2.12	4.12	2.37	67	41	33	41	0	0	NO
5.6 - Personal/Social	5	5.25	5.12	1.36	96	20	4	20	0	0	NO
Total	48	50.38	56.62	8.59	51	47	39	44	10	28	

Table 5.3

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

West Virginia Grade 5 Science—November 2003

Number of Assessment Items–50

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 - History/Nature	4	4.12	1.75	0.66	1.62	0.70	39	17	NO	3	1	1	0	YES
5.2 - Inquiry	8	8.88	13.5	4.56	6.12	1.05	69	13	YES	23	4	0.78	0.05	YES
5.3 - Unifying Themes	4	4.12	4.29	1.91	2.57	0.90	61	19	YES	8	4	0.82	0.13	YES
5.4 – Subj Matter/Conc	25	25.88	28.38	2.55	16.38	1.73	63	7	YES	51	5	0.78	0.05	YES
5.5 - Design/Applic	2	2.12	4.12	2.37	1.62	0.48	79	27	YES	7	4	0.92	0.10	YES
5.6 - Personal/Social	5	5.25	5.12	1.36	2.88	0.60	55	13	YES	9	2	0.79	0.09	YES
Total	48	50.38	56.62	8.59	5.20	5.36	61	21		17	17	0.85	0.12	

Table 5.4
Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers
West Virginia Grade 5 Science—November 2003
Number of Assessment Items–50

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
5.1 - History/Nature	NO	YES	NO	YES
5.2 - Inquiry	YES	NO	YES	YES
5.3 - Unifying Themes	NO	YES	YES	YES
5.4 – Subj Matter/Conc	YES	YES	YES	YES
5.5 - Design/Applic	NO	NO	YES	YES
5.6 - Personal/Social	NO	NO	YES	YES

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

Item Number	Comments by Reviewer
3	Misleading item
	Does a car have a problem if it runs out of gas or is it the drivers problem?
11	Not really measuring effectiveness
14	Huge stretch
16	Correct answer is longer than distractors
30	No match to inquiry standards
35	The next step would be to add ice to the beaker, then measure the cov, beak and ice
37	1 of 3 could be correct
	3rd answer could have some validity
49	Correct answer longer than others
50	Where do oranges fit on the pyramid? Misleading
	Organisms? Poor answer choice

Table 5.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 5 Science—November 2003

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

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

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

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

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	1	1	1	1	1	1	1	1
43	1	2	2	1	1	1	2	1
44	1	2	2	2	2	2	2	3
45	1	2	2	1	1	1	1	1
46	1	2	1	1	1	1	1	1
47	2	1	2	1	2	1	2	1
48	1	1	2	1	1	2	1	2
49	1	2	2	2	2	2	2	1
50	2	1	2	1	2	2	2	2
Intraclass Corr Grade 5 Science					0.843			

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

Item Number	Comments by Reviewer
4	No objective for changes in state. Prop of objects
	Weak match-no match in each system
	Described weather patterns, but didn't use xx
5	Weak match
	No objective for conservation
6	No objective for conductivity. Light, heat, elect. & mag.
	Weak match; no match in each system
	Light, heat, elect., mag.
	(Reviewer wrote by primary obj: electricity conductors/nonconductors)
	Poorly constructed drawing; penny too small
9	No objective for conductivity. Light, heat, elect. & mag.
10	Structure/function of living things
12	Too sophisticated a concept for fifth graders.

Table 5.7(continued)
Notes by Reviewer
West Virginia Grade 5 Science—November 2003

Item Number	Comments by Reviewer
14	Structure of the earth system
	Terrible item
17	Weak match
18	Weak match
19	Weak match
	Structure of earth system
	Structure of earth's sys.
25	Freezing rate
	No objective for change in state. Prop obj. & mat.
	No match to char. Properties
26	No objective for conservation

Table 5.7 (continued)
Notes by Reviewer
West Virginia Grade 5 Science—November 2003

Item Number	Comments by Reviewer
35	(Reviewer wrote by secondary obj: possibly.) Asks for order of steps only.
36	Difficult concept for 5th grade (amt. of surface area)
37	Difficult concept (surface area vs. pressure)
41	Populations & extinctions
42	Not land features
44	Pop & ecosystem. No obj for fund claims
45	No obj. for conservation
50	Pop. & ecosystems

Table 5.8
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewers
Grade 5 Science—November 2003
West Virginia

Item	DOK	Pobj	DOK	Pobj	S1Obj	DOK	Pobj	S1Obj	DOK	Pobj	DOK	POBj	S1Obj	DOK	POBj	DOK	POBj	S1Obj	DOK	POBj	S1Obj
1	1	5.6.1	1	5.4.1	5.6.1	2	5.4.3		1	5.6.1	1	5.6.1		1	5.6.3	1	5.6.1		1	5.6.3	5.4.1
2	1	5.4.3	1	5.4.3		1	5.4.3		1	5.4.3	1	5.4.3		1	5.4.3	1	5.4.3		1	5.4.3	
3	1	5.2.7	1	5.2		1	5.2.7		1	5.2.7	1	5.2		1	5.2.8	1	5.2		2	5.2.7	
4	2	5.4	1	5.3.2		2	5.4		1	5.3.2	2	5.4.20		2	5.4.20	2	5.3		2	5.3.4	
5	1	5.6	1	5.6.1	5.4.23	1	5.6.3		1	5.6.1	1	5.6.3		1	5.6.1	1	5.6		1	5.6.1	
6	1	5.4	1	5.4		1	5.4.13		1	5.4.13	1	5.4.13	5.2.7	1	5.4.13	1	5.4		2	5.4.13	
7	1	5.4.3	1	5.4.3		1	5.4.6		1	5.4.3	1	5.4.3		1	5.4.3	1	5.4.3		1	5.4.6	
8	2	5.2.6	1	5.2.8		2	5.2.1		1	5.2.3	2	5.2.2	5.2.7	2	5.2.2	2	5.2.6		2	5.2.8	
9	1	5.4	1	5.4.13		1	5.4.13		1	5.4.13	1	5.4.13	5.2.7	3	5.3.1	1	5.4.13		1	5.4.13	
10	2	5.4	2	5.4.6	5.4.2	2	5.4.2	5.4.5	2	5.4.2	1	5.4	5.2.6	2	5.4.6	1	5.3.3	5.4.6	2	5.2.8	
11	2	5.5.1	1	5.5.2		2	5.2.5	5.3.4	1	5.5.2	1	5.5.1	5.5.2	2	5.2.8	2	5.5		1	5.2.8	
12	1	5.4.16	1	5.4.16		2	5.4.16		1	5.4.16	1	5.4.16		1	5.4.16	1	5.4.16		1	5.2.2	
13	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		1	5.4.2	
14	2	5.4	1	5.2.8		2	5.2		1	5.5.2	2	5.3.3	5.1.4	1	5.2.8	1	5.2		1	5.2.8	
15	2	5.5.2	2	5.5.1	5.3.1	2	5.5.2	5.1.1	2	5.5.1	2	5.3.1		3	5.3.4	1	5.3.1		2	5.3.1	
16	2	5.5.2	2	5.1.1	5.4.1	2	5.5.2		2	5.5.1	2	5.5.2	5.5.1	2	5.4.16	2	5.5		2	5.4.1	
17	1	5.4.12	2	5.4.12		1	5.4.12		1	5.4.12	1	5.4.12		1	5.4.12	1	5.4.12		1	5.4.12	
18	1	5.4.25	2	5.4.25		2	5.4.25		1	5.4.25	1	5.4.25		1	5.4.25	1	5.3.3		1	5.4.25	
19	1	5.4	2	5.6.2		1	5.6.2	5.2.6	2	5.4.25	1	5.4.25		2	5.6.2	1	5.4		1	5.6.2	
20	1	5.2.8	1	5.4.4		1	5.4.5		2	5.2.2	1	5.4.6	5.2.7	1	5.4.3	1	5.2.8		2	5.3.3	
21	3	5.2.8	2	5.2.8		2	5.2.8		2	5.2.8	2	5.6.3	5.2.7	1	5.2.7	2	5.2.8		2	5.2.2	
22	2	5.2.8	1	5.2.8		2	5.2.8		1	5.2.8	2	5.2.8	5.2.7	2	5.2.8	2	5.2.8		2	5.3.3	5.6.1
23	1	5.2.4	2	5.2.4		1	5.2.4		2	5.2	1	5.2.4		1	5.2	1	5.2.4		2	5.2.6	
24	1	5.4.16	1	5.4.16		2	5.4.16		1	5.4.16	1	5.4.16		1	5.4.16	1	5.4.16		1	5.4.16	
25	1	5.4	1	5.4		2	5.4.20		1	5.4	1	5.2.4		1	5.4.20	1	5.4.20		1	5.2.4	
26	1	5.6	1	5.6.1		1	5.6.1		1	5.6.1	2	5.6.3		2	5.6.3	2	5.6.1		2	5.6.1	
27	1	5.4.21	1	5.4.1		1	5.4.21		1	5.4.21	1	5.4.21		2	5.4.21	1	5.4.21		1	5.3.3	

Table 5.8 (continued)
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewers
Grade 5 Science—November 2003
West Virginia

Item	DOK	Pobj	S1Obj	DOK	Pobj	S1Obj	DOK	Pobj	S1Obj	DOK	Pobj	DOK	POBj	S1Obj	S2Obj	DOK	POBj	S1Obj	DOK	POBj	DOK	POBj	S1Obj
28	2	5.4.3		1	5.4.6		2	5.4.6		1	5.4.6	1	5.4.6			1	5.4.6		1	5.4.6	2	5.4.6	
29	1	5.4.5		1	5.4.3		1	5.4.3		1	5.4.3	1	5.4.3			1	5.4.5		1	5.4.3	1	5.4.3	
30	1	5.2		1	5.2		1	5.2.2		1	5.2	1	5.2.6	5.2.2		1	5.2.2		1	5.2.6	1	5.2.4	
31	1	5.4		1	5.4.8		1	5.4.8		1	5.4.8	1	5.3.3	5.4.1	5.6.1	2	5.4.8		1	5.4.2	2	5.4.1	
32	1	5.2.4		1	5.2.4		1	5.2.4		1	5.6.4	1	5.5.1			1	5.5.1		1	5.1	1	5.1.1	
33	1	5.4		1	5.4.15		2	5.4.15		1	5.4.15	2	5.4.15			2	5.4.15		2	5.4.15	2	5.4.15	
34	1	5.4.23		1	5.4.23		1	5.4.23		1	5.4.23	1	5.4.23			1	5.4.23		1	5.4.23	1	5.2.3	5.4
35	2	5.2.6		2	5.2	5.2.3	2	5.3.4	5.2.6	2	5.2.3	2	5.4.9	5.2.6		2	5.4.9		2	5.2	3	5.2.8	
36	2	5.5.2		2	5.5.2		2	5.3.4		2	5.5.2	2	5.3.4	5.5.2		3	5.3.4		2	5.3.4	2	5.5.2	
37	2	5.5.2		2	5.3.4		2	5.3.4		2	5.5.2	2	5.5.2	5.3.3		3	5.5.2		2	5.3.4	3	5.5.2	
38	1	5.1.4	5.4.4	1	5.1.4		2	5.1.4	5.2.4	1	5.1.2	2	5.1.4	5.4.4		2	5.1.3	5.1.4	2	5.1.4	2	5.4.4	
39	1	5.4.9		2	5.4.9		2	5.4.9		1	5.4.9	1	5.4.9			1	5.4.9		1	5.4.9	1	5.3.3	
40	2	5.4.12		2	5.4.12		2	5.4.12		1	5.4.12	2	5.4.12	5.2.8		2	5.4.12		2	5.4.12	2	5.4.12	
41	1	5.2.5		2	5.5.2		2	5.4.6		2	5.5.2	1	5.2.5	5.4		1	5.4.6		1	5.4	1	5.4.1	
42	1	5.4.22		1	5.4.22		1	5.4.22		1	5.4.22	1	5.4.22	5.2.7		1	5.4.22		1	5.4.22	1	5.4.22	
43	1	5.5.1		2	5.6.4		2	5.4.16		1	5.4.16	1	5.4.16	5.5.1		1	5.4.16		2	5.4.16	1	5.2.8	
44	1	5.4		2	5.4.8		2	5.4.8		2	5.4.8	2	5.4.8	5.4.7	5.2.7	2	5.4.8		2	5.4.8	3	5.3.3	
45	1	5.6		2	5.6.3		2	5.4.23	5.1.2	1	5.6.1	1	5.6.1	5.6.5		1	5.6.1	5.6.3	1	5.6.5	1	5.4.23	
46	1	5.2.5		2	5.2.5		1	5.2.5		1	5.2.5	1	5.2.5			1	5.2.5		1	5.2.5	1	5.2.5	
47	2	5.4.18		1	5.4.18		2	5.4.24	5.2.7	1	5.4.18	2	5.4.18	5.2.7		1	5.2.7	5.4.18	2	5.4.18	1	5.4.18	
48	1	5.4.20		1	5.4.20		2	5.2.4		1	5.4.20	1	5.2.4			2	5.4.20		1	5.4.20	2	5.4.20	
49	1	5.4.20		2	5.2.8	5.4.1	2	5.2.8		2	5.4.20	2	5.2.6	5.4.20	5.4.19	2	5.4.19	5.6.3	2	5.4.20	1	5.4.20	
50	2	5.4		1	5.4.8		2	5.3.2	5.4.8	1	5.4.8	2	5.4.8	5.2.7		2	5.2.7		2	5.4.8	2	5.2.7	

Table 5.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 5 Science—November 2003

Low		Medium		High
8		9.06		12

1:	5.4.1	5.4.1	5.4.3	5.6.1	5.6.1	5.6.1	5.6.1	5.6.1	5.6.3	5.6.3		
2:	5.4.3	5.4.3	5.4.3	5.4.3	5.4.3	5.4.3	5.4.3	5.4.3				
3:	5.2	5.2	5.2	5.2.7	5.2.7	5.2.7	5.2.7	5.2.8				
4:	5.3	5.3.2	5.3.2	5.3.4	5.4	5.4	5.4.20	5.4.20				
5:	5.4.23	5.6	5.6	5.6.1	5.6.1	5.6.1	5.6.1	5.6.3	5.6.3			
6:	5.2.7	5.4	5.4	5.4	5.4.13	5.4.13	5.4.13	5.4.13	5.4.13			
7:	5.4.3	5.4.3	5.4.3	5.4.3	5.4.3	5.4.3	5.4.6	5.4.6				
8:	5.2.1	5.2.2	5.2.2	5.2.3	5.2.6	5.2.6	5.2.7	5.2.8	5.2.8			
9:	5.2.7	5.3.1	5.4	5.4.13	5.4.13	5.4.13	5.4.13	5.4.13	5.4.13			
10:	5.2.6	5.2.8	5.3.3	5.4	5.4	5.4.2	5.4.2	5.4.2	5.4.5	5.4.6	5.4.6	5.4.6
11:	5.2.5	5.2.8	5.2.8	5.3.4	5.5	5.5.1	5.5.1	5.5.2	5.5.2	5.5.2		
12:	5.2.2	5.4.16	5.4.16	5.4.16	5.4.16	5.4.16	5.4.16	5.4.16				
13:	5.4.2	5.4.2	5.4.2	5.4.2	5.4.2	5.4.2	5.4.2	5.4.2				
14:	5.1.4	5.2	5.2	5.2.8	5.2.8	5.2.8	5.3.3	5.4	5.5.2			
15:	5.1.1	5.3.1	5.3.1	5.3.1	5.3.1	5.3.4	5.5.1	5.5.1	5.5.2	5.5.2		
16:	5.1.1	5.4.1	5.4.1	5.4.16	5.5	5.5.1	5.5.1	5.5.2	5.5.2	5.5.2		
17:	5.4.12	5.4.12	5.4.12	5.4.12	5.4.12	5.4.12	5.4.12	5.4.12				
18:	5.3.3	5.4.25	5.4.25	5.4.25	5.4.25	5.4.25	5.4.25	5.4.25				
19:	5.2.6	5.4	5.4	5.4.25	5.4.25	5.6.2	5.6.2	5.6.2	5.6.2			
20:	5.2.2	5.2.7	5.2.8	5.2.8	5.3.3	5.4.3	5.4.4	5.4.5	5.4.6			
21:	5.2.2	5.2.7	5.2.7	5.2.8	5.2.8	5.2.8	5.2.8	5.2.8	5.6.3			
22:	5.2.7	5.2.8	5.2.8	5.2.8	5.2.8	5.2.8	5.2.8	5.2.8	5.3.3	5.6.1		

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

23:	5.2	5.2	5.2.4	5.2.4	5.2.4	5.2.4	5.2.4	5.2.6				
24:	5.4.16	5.4.16	5.4.16	5.4.16	5.4.16	5.4.16	5.4.16	5.4.16				
25:	5.2.4	5.2.4	5.4	5.4	5.4	5.4.20	5.4.20	5.4.20				
26:	5.6	5.6.1	5.6.1	5.6.1	5.6.1	5.6.1	5.6.3	5.6.3				
27:	5.3.3	5.4.1	5.4.21	5.4.21	5.4.21	5.4.21	5.4.21	5.4.21				
28:	5.4.3	5.4.6	5.4.6	5.4.6	5.4.6	5.4.6	5.4.6	5.4.6				
29:	5.4.3	5.4.3	5.4.3	5.4.3	5.4.3	5.4.3	5.4.5	5.4.5				
30:	5.2	5.2	5.2	5.2.2	5.2.2	5.2.2	5.2.4	5.2.6	5.2.6			
31:	5.3.3	5.4	5.4.1	5.4.1	5.4.2	5.4.8	5.4.8	5.4.8	5.4.8	5.6.1		
32:	5.1	5.1.1	5.2.4	5.2.4	5.2.4	5.5.1	5.5.1	5.6.4				
33:	5.4	5.4.15	5.4.15	5.4.15	5.4.15	5.4.15	5.4.15	5.4.15				
34:	5.2.3	5.4	5.4.23	5.4.23	5.4.23	5.4.23	5.4.23	5.4.23	5.4.23			
35:	5.2	5.2	5.2.3	5.2.3	5.2.6	5.2.6	5.2.6	5.2.8	5.3.4	5.4.9	5.4.9	
36:	5.3.4	5.3.4	5.3.4	5.3.4	5.5.2	5.5.2	5.5.2	5.5.2	5.5.2			
37:	5.3.3	5.3.4	5.3.4	5.3.4	5.5.2	5.5.2	5.5.2	5.5.2	5.5.2			
38:	5.1.2	5.1.3	5.1.4	5.1.4	5.1.4	5.1.4	5.1.4	5.1.4	5.2.4	5.4.4	5.4.4	5.4.4
39:	5.3.3	5.4.9	5.4.9	5.4.9	5.4.9	5.4.9	5.4.9	5.4.9				
40:	5.2.8	5.4.12	5.4.12	5.4.12	5.4.12	5.4.12	5.4.12	5.4.12	5.4.12			
41:	5.2.5	5.2.5	5.4	5.4	5.4.1	5.4.6	5.4.6	5.5.2	5.5.2			
42:	5.2.7	5.4.22	5.4.22	5.4.22	5.4.22	5.4.22	5.4.22	5.4.22	5.4.22			
43:	5.2.8	5.4.16	5.4.16	5.4.16	5.4.16	5.4.16	5.5.1	5.5.1	5.6.4			
44:	5.2.7	5.3.3	5.4	5.4.7	5.4.8	5.4.8	5.4.8	5.4.8	5.4.8	5.4.8		
45:	5.1.2	5.4.23	5.4.23	5.6	5.6.1	5.6.1	5.6.1	5.6.3	5.6.3	5.6.5	5.6.5	

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

46:	5.2.5	5.2.5	5.2.5	5.2.5	5.2.5	5.2.5	5.2.5	5.2.5				
47:	5.2.7	5.2.7	5.2.7	5.4.18	5.4.18	5.4.18	5.4.18	5.4.18	5.4.18	5.4.18	5.4.24	
48:	5.2.4	5.2.4	5.4.20	5.4.20	5.4.20	5.4.20	5.4.20	5.4.20				
49:	5.2.6	5.2.8	5.2.8	5.4.1	5.4.19	5.4.19	5.4.20	5.4.20	5.4.20	5.4.20	5.4.20	5.6.3
50:	5.2.7	5.2.7	5.2.7	5.3.2	5.4	5.4.8	5.4.8	5.4.8	5.4.8	5.4.8		

Table 5.10
Items Coded by Reviewers to Each Objective
West Virginia Grade 5 Science—November 2003

Low		Medium		High
0		8.236363		28

root:																												
5.1:	32																											
5.1.1:	15	16	32																									
5.1.2:	38	45																										
5.1.3:	38																											
5.1.4:	14	38	38	38	38	38	38																					
5.2:	3	3	3	14	14	23	23	30	30	30	35	35																
5.2.1:	8																											
5.2.2:	8	8	12	20	21	30	30	30																				
5.2.3:	8	34	35	35																								
5.2.4:	23	23	23	23	23	25	25	30	32	32	32	38	48	48														
5.2.5:	11	41	41	46	46	46	46	46	46	46	46																	
5.2.6:	8	8	10	19	23	30	30	35	35	35	49																	
5.2.7:	3	3	3	3	6	8	9	20	21	21	22	42	44	47	47	47	50	50	50									
5.2.8:	3	8	8	10	11	11	14	14	14	20	20	21	21	21	21	21	22	22	22	22	22	22	22	35	40	43	49	49
5.3:	4																											
5.3.1:	9	15	15	15	15																							
5.3.2:	4	4	50																									
5.3.3:	10	14	18	20	22	27	31	37	39	44																		
5.3.4:	4	11	15	35	36	36	36	36	37	37	37																	

Table 5.10 (continued)
Items Coded by Reviewers to Each Objective
West Virginia Grade 5 Science—November 2003

5.4:	4	4	6	6	6	9	10	10	14	19	19	25	25	25	31	33	34	41	41	44	50		
5.4.1:	1	1	16	16	27	31	31	41	49														
5.4.2:	10	10	10	13	13	13	13	13	13	13	13	31											
5.4.3:	1	2	2	2	2	2	2	2	2	7	7	7	7	7	7	20	28	29	29	29	29	29	29
5.4.4:	20	38	38	38																			
5.4.5:	10	20	29	29																			
5.4.6:	7	7	10	10	10	20	28	28	28	28	28	28	28	41	41								
5.4.7:	44																						
5.4.8:	31	31	31	31	44	44	44	44	44	44	50	50	50	50	50								
5.4.9:	35	35	39	39	39	39	39	39	39														
5.4.10:																							
5.4.11:																							
5.4.12:	17	17	17	17	17	17	17	17	40	40	40	40	40	40	40	40							
5.4.13:	6	6	6	6	6	9	9	9	9	9	9												
5.4.14:																							
5.4.15:	33	33	33	33	33	33	33																
5.4.16:	12	12	12	12	12	12	12	16	24	24	24	24	24	24	24	24	43	43	43	43	43		
5.4.17:																							
5.4.18:	47	47	47	47	47	47	47																
5.4.19:	49	49																					
5.4.20:	4	4	25	25	25	48	48	48	48	48	48	49	49	49	49	49							
5.4.21:	27	27	27	27	27	27																	
5.4.22:	42	42	42	42	42	42	42	42															
5.4.23:	5	34	34	34	34	34	34	34	45	45													

Table 5.10 (continued)
Items Coded by Reviewers to Each Objective
West Virginia Grade 5 Science—November 2003

5.4.24:	47																						
5.4.25:	18	18	18	18	18	18	18	19	19														
5.5:	11	16																					
5.5.1:	11	11	15	15	16	16	32	32	43	43													
5.5.2:	11	11	11	14	15	15	16	16	16	36	36	36	36	36	37	37	37	37	37	41	41		
5.6:	5	5	26	45																			
5.6.1:	1	1	1	1	1	5	5	5	5	22	26	26	26	26	26	31	45	45	45				
5.6.2:	19	19	19	19																			
5.6.3:	1	1	5	5	21	26	26	45	45	49													
5.6.4:	32	43																					
5.6.5:	45	45																					

Table 5.11

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

West Virginia Grade 5 Science—November 2003

One Reviewer		50 % of Reviewers		All Reviewers
1		4		8

root:												
5.1:	32:1											
5.1.1:	15:1	16:1	32:1									
5.1.2:	38:1	45:1										
5.1.3:	38:1											
5.1.4:	14:1	38:6										
5.2:	3:3	14:2	23:2	30:3	35:2							
5.2.1:	8:1											
5.2.2:	8:2	12:1	20:1	21:1	30:3							
5.2.3:	8:1	34:1	35:2									
5.2.4:	23:5	25:2	30:1	32:3	38:1	48:2						
5.2.5:	11:1	41:2	46:8									
5.2.6:	8:2	10:1	19:1	23:1	30:2	35:3	49:1					
5.2.7:	3:4	6:1	8:1	9:1	20:1	21:2	22:1	42:1	44:1	47:3	50:3	
5.2.8:	3:1	8:2	10:1	11:2	14:3	20:2	21:5	22:7	35:1	40:1	43:1	49:2
5.3:	4:1											
5.3.1:	9:1	15:4										
5.3.2:	4:2	50:1										
5.3.3:	10:1	14:1	18:1	20:1	22:1	27:1	31:1	37:1	39:1	44:1		
5.3.4:	4:1	11:1	15:1	35:1	36:4	37:3						

Table 5.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 5 Science—November 2003

5.4:	4:2	6:3	9:1	10:2	14:1	19:2	25:3	31:1	33:1	34:1	41:2	44:1	50:1
5.4.1:	1:2	16:2	27:1	31:2	41:1	49:1							
5.4.2:	10:3	13:8	31:1										
5.4.3:	1:1	2:8	7:6	20:1	28:1	29:6							
5.4.4:	20:1	38:3											
5.4.5:	10:1	20:1	29:2										
5.4.6:	7:2	10:3	20:1	28:7	41:2								
5.4.7:	44:1												
5.4.8:	31:4	44:6	50:5										
5.4.9:	35:2	39:7											
5.4.10:													
5.4.11:													
5.4.12:	17:8	40:8											
5.4.13:	6:5	9:6											
5.4.14:													
5.4.15:	33:7												
5.4.16:	12:7	16:1	24:8	43:5									
5.4.17:													
5.4.18:	47:7												
5.4.19:	49:2												
5.4.20:	4:2	25:3	48:6	49:5									
5.4.21:	27:6												
5.4.22:	42:8												
5.4.23:	5:1	34:7	45:2										

Table 5.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 5 Science—November 2003

5.4.24:	47:1						
5.4.25:	18:7	19:2					
5.5:	11:1	16:1					
5.5.1:	11:2	15:2	16:2	32:2	43:2		
5.5.2:	11:3	14:1	15:2	16:3	36:5	37:5	41:2
5.6:	5:2	26:1	45:1				
5.6.1:	1:5	5:4	22:1	26:5	31:1	45:3	
5.6.2:	19:4						
5.6.3:	1:2	5:2	21:1	26:2	45:2	49:1	
5.6.4:	32:1	43:1					
5.6.5:	45:2						

Table 6.1
Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 6 Science—November 2003
Number of Assessment Items–50

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 - History/Nature	4	4.12	1	4	100	3.5	1	NO
6.2 - Inquiry	9	9.38	1 2 3	2 2 5	22 22 55	18.12	2.57	YES
6.3 - Unifying Themes	4	4	2	4	100	2.33	0.94	NO
6.4 - Subj Matter/Conc	30	30.88	1 2	10 20	33 66	27.5	4.44	YES
6.5 - Design/Applic	2	2.25	2 3	1 1	50 50	2.57	0.49	NO
6.6 - Personal/Social	5	5	2 3	1 4	20 80	3.14	1.36	NO
Total	54	55.62	1 2 3	16 28 10	29 51 18	55.88	6.07	

Table 6.2
Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 6 Science—November 2003
Number of Assessment Items–50

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 - History/Nature	4	4.12	3.5	1	0	0	87	19	13	19	YES
6.2 – Inquiry	9	9.38	18.12	2.57	62	44	32	37	6	13	NO
6.3 - Unifying Themes	4	4	2.33	0.94	42	49	50	50	8	28	YES
6.4 - Subj Matter/Concepts	30	30.88	27.5	4.44	48	46	43	44	9	26	YES
6.5 - Design/Application	2	2.25	2.57	0.49	77	33	23	33	0	0	NO
6.6 - Personal/Social	5	5	3.14	1.36	100	0	0	0	0	0	NO
Total	54	55.62	55.88	6.07	53	46	40	43	8	22	

Table 6.3
Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 6 Science—November 2003
Number of Assessment Items–50

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 - History/Nature	4	4.12	3.5	1	1.75	0.97	42	24	WEAK	6	2	0.94	0.09	YES
6.2 - Inquiry	9	9.38	18.12	2.57	6	0.71	64	7	YES	32	4	0.73	0.07	YES
6.3 - Unifying Themes	4	4	2.33	0.94	2	0.82	50	20	YES	4	2	0.94	0.08	YES
6.4 - Subj Matter/Conc	30	30.88	27.5	4.44	16.25	2.11	53	7	YES	49	4	0.78	0.03	YES
6.5 - Design/Applic	2	2.25	2.57	0.49	1.43	0.49	62	17	YES	5	1	0.95	0.08	YES
6.6 - Personal/Social	5	5	3.14	1.36	2.29	0.70	46	14	WEAK	5	2	0.98	0.06	YES
Total	54	55.62	55.88	6.07	4.95	5.55	53	18		17	18	0.89	0.12	

Table 6.4
Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers
West Virginia Grade 6 Science—November 2003
Number of Assessment Items–50

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
6.1 - History/Nature	NO	YES	WEAK	YES
6.2 - Inquiry	YES	NO	YES	YES
6.3 - Unifying Themes	NO	YES	YES	YES
6.4 - Subj Matter/Conc	YES	YES	YES	YES
6.5 - Design/Applic	NO	NO	YES	YES
6.6 - Personal/Social	NO	NO	WEAK	YES

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

Item Number	Comments by Reviewer
23	Picture does not allow students to distinguish features in key. Better match to earlier standard.
28	This is a reading comprehension problem
36	Stretch. Reading comprehension problem
38	Copper or plastic correct answers
	Disagree with key-copper correct answer?
49	Jane's hypothesis does not say if wind increases or decreases the speed of absorption and transpiration therefore several answers could be correct

Table 6.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 6 Science—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	1	1	2	1
4	1	1	1	1	1	1	1	1
5	1	2	2	2	1	1	2	2
6	1	2	1	2	2	1	2	1
7	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1
9	1	2	1	2	2	1	1	2
10	1	1	1	1	1	1	1	1
11	1	2	1	2	2	1	1	1
12	2	2	2	2	1	2	1	2
13	1	1	1	1	1	1	1	1
14	1	1	2	1	1	2	1	1
15	2	1	2	1	1	2	1	1
16	1	1	2	1	1	1	2	1
17	1	1	2	1	1	2	1	1
18	1	1	2	1	1	1	2	1
19	2	1	2	2	2	1	1	2
20	1	1	2	1	2	1	1	1
21	2	2	2	2	2	1	2	2

Table 6.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 6 Science—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	2	2	2	2	2	2	2
24	1	2	2	1	1	1	1	1
25	2	1	1	1	1	1	1	1
26	1	1	2	1	1	2	1	2
27	1	1	2	1	1	1	1	1
28	2	2	2	2	2	2	2	3
29	1	1	2	1	1	1	1	1
30	2	1	2	1	2	2	2	2
31	1	1	2	1	2	1	1	2
32	2	2	2	2	2	1	2	2
33	1	1	2	1	1	1	1	1
34	2	1	2	1	1	2	1	2
35	2	2	2	2	2	3	2	3
36	1	1	2	2	1	1	1	1
37	2	2	2	2	2	2	2	3
38	1	2	2	2	1	1	1	2
39	2	2	2	2	2	2	2	2
40	2	2	2	2	2	2	3	3
41	1	1	2	1	1	1	1	1

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

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	2	1	1	1	1	2	1	1
43	1	1	1	1	1	1	1	1
44	2	1	2	1	1	2	1	2
45	1	2	2	1	2	2	2	2
46	1	2	2	1	1	1	1	1
47	2	1	2	2	2	1	1	2
48	1	1	1	1	1	1	1	1
49	2	2	2	2	2	2	2	2
50	1	2	1	1	2	2	1	2
Intraclass Corr Grade 6 Science					0.866			

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

Item Number	Comments by Reviewer
2	Body part compared to function—3rd/4th grade objective
	This question is better matched to grades 3, 4, and 5 standards
5	Reviewer put ? after second obj.
7	Reviewer put ? after 6.3.2?
8	Weak match
10	Better match to 3, 4, and 5 grade standards struct. and funct.
11	Inquiry-about asking scientific questions
14	Match to earth and solar system
	Earth and solar system
	Earth & Solar system. Correct answer longer than rest.
18	Stem wording confusing
22	Just reading a chart. After primary obj. Reviewer put: no construction
23	#23-25: no construction

Table 6.7(continued)
Notes by Reviewer
West Virginia Grade 6 Science—November 2003

Item Number	Comments by Reviewer
29	Better match to an earlier (Grade 3 to 5) standards on earth materials
	Structure of earth sys.
	Reviewer put question mark after primary obj.
30	Weak match
33	Better match to rock cycle standard at an earlier grade level
34	Results of plate tectonics
37	After primary obj. Reviewer put: no construct
38	Not an exact match
45	There are no numbers on the gauges in the diagram weak match
	Force fit; otherwise is 6.4.0

Table 6.8
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewers
Grade 6 Science—November 2003
West Virginia

Item	DOK	PObj	DOK	PObj	S1Obj	S2Obj	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj	S1Obj
1	1	6.1.4	1	6.1.4			1	6.1.4		1	6.1.4	1	6.1.4		1	6.1.4		1	6.1.4	1	6.1.2	
2	1	6.4	1	6.4			1	6.4.3		1	6.4	1	6.4		1	6.2.4		1	6.4.3	1	6.4.3	
3	1	6.4.5	1	6.4.18			2	6.4.18		1	6.4.18	1	6.4.18	6.2.7	1	6.4.18		2	6.4.18	1	6.2.8	
4	1	6.2.4	1	6.2.4			1	6.2.4		1	6.2.4	1	6.2.4		1	6.2.4		1	6.2.4	1	6.2.4	
5	1	6.3.1	2	6.4.8	6.4.5		2	6.4.8		2	6.4.8	1	6.4.8		1	6.2.4		2	6.2.6	2	6.4.5	6.2.8
6	1	6.6.3	2	6.1.4			1	6.1.4		2	6.1.4	2	6.4.8	6.2.8	1	6.2.8		2	6.6.1	1	6.2.8	
7	1	6.4.29	1	6.4.29	6.2.7	6.3.2	1	6.4.29		1	6.4.29	1	6.4.29	6.2.7	1	6.2.7		1	6.4.29	1	6.3.2	
8	1	6.4.23	1				1	6.4.23		1	6.4.23	1	6.4.23		1	6.4.23		1	6.4.23	1	6.4.23	
9	1	6.2.7	2	6.2.8	6.2.7		1	6.2.7		2	6.2.7	2	6.2.7		1	6.2.7		1	6.2.8	2	6.2	
10	1	6.4.3	1	6.4.3			1	6.4.2		1	6.4	1	6.4.3		1	6.4.4		1	6.4.3	1	6.4.3	
11	1	6.2.3	2	6.1.1			1	6.2.6		2	6.2	2	6.2.2	6.2.8	1	6.2.2		1	6.2.6	1	6.2.8	
12	2	6.4.9	2	6.4.9			2	6.4.9		2	6.4.9	1	6.4.9	6.4.8	2	6.4.8	6.4.9	1	6.4.9	2	6.4.8	6.2.8
13	1	6.1.4	1	6.1.1			1	6.1.4		1	6.1.4	1	6.1.3	6.1.1	1	6.4.5		1	6.1.4	1	6.1	
14	1	6.4	1	6.4.30			2	6.4		1	6.4	1	6.4		2	6.4.22		1	6.4	1	6.4	
15	2	6.5.2	1	6.5.1			2	6.5.2		1	6.5.2	1	6.6.1	6.6.3	2	6.4.16	6.5.2	1	6.6.5	1	6.5.2	
16	1		1	6.4.24			2	6.2.8	6.4.17	1	6.2.4	1	6.4.16		1	6.2.4		2	6.2.8	1	6.2.7	
17	1	6.5.1	1	6.4.18			2	6.4.18		1	6.4.18	1	6.4		2	6.4.17		1	6.5.2	1	6.5.2	
18	1	6.4.30	1	6.4.25			2	6.4.30		1	6.4.30	1	6.4.30		1	6.4.19		2	6.4.18	1	6.4.29	
19	2	6.2.6	1	6.2.6	6.2.2		2	6.2.1		2	6.2.6	2	6.2.6		1	6.4.7		1	6.2.6	2	6.2.6	
20	1	6.4.15	1	6.4.16			2	6.4.16		1	6.4.16	2	6.4.16		1	6.4.16		1	6.4.10	1	6.3.4	
21	2	6.2.8	2	6.2.6			2	6.2.6		2	6.2.6	2	6.4.7	6.2.2	1	6.2.6		2	6.2.6	2	6.4.7	6.2.8
22	1	6.2.7	1	6.2.7			1	6.2.7		1	6.2.7	1	6.2.7		1	6.2.7		1	6.2.7	1	6.2.7	
23	2	6.2	2	6.2.7			2	6.2.7		2	6.3.2	2	6.4	6.2.7	2	6.4.10		2	6.2.7	2	6.4	
24	1	6.4.26	2	6.2.7			2	6.4.26		1	6.4.26	1	6.4.26		1	6.4.26		1	6.4.26	1	6.4.26	
25	2	6.2.7	1	6.2.7			1	6.2.7		1	6.2.7	1	6.2.7		1	6.2.7		1	6.2.8	1	6.2.7	
26	1	6.4.10	1	6.4.16			2	6.4.10		1	6.4.10	1	6.4.10		2	6.4.10		1	6.4.10	2	6.4.10	
27	1	6.4.9	1	6.6.3			2	6.6.1		1	6.6.3	1	6.6.3		1	6.6.3		1	6.6.1	1	6.4.9	

Table 6.8 (continued)
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewers
Grade 6 Science—November 2003
West Virginia

Item	DOK	Pobj	S1Obj	DOK	PObj	S1Obj	S2Obj	DOK	POBj	S1Obj	DOK	POBj	S1Obj	DOK	POBj	S1Obj	DOK	POBj	S1Obj	DOK	POBj	S1Obj	DOK	POBj	S1Obj
28	2	6.6.5		2	6.6.5			2	6.6.5		2	6.6.5		2	6.6.5		2	6.1.4		2	6.6.5	6.1.4	3	6.2.8	
29	1	6.4.9		1	6.4			2	6.4.9		1	6.4		1	6.4.9		1	6.4.9		1	6.4		1	6.4	
30	2	6.4.9		1	6.4.3			2	6.4.2		1	6.4.9		2	6.4.1		2	6.4.2		2	6.3.1		2	6.4.9	
31	1	6.4.16		1	6.4.16			2	6.4.16		1	6.2.7		2	6.4.16	6.2.7	1	6.2.8		1	6.2.8		2	6.2.8	
32	2	6.2.3		2	6.2.7	6.2.8		2	6.5.2	6.4.8	2	6.2.7		2	6.4.1	6.2.7	1	6.2.7		2	6.2.8		2	6.2.7	
33	1	6.4.27		1	6.4.27			2	6.4.27		1	6.4.27		1	6.4.27		1	6.4.27		1	6.4.27		1	6.4.27	
34	2	6.4.26		1	6.4.26			2	6.4.26		1	6.4.27		1	6.4.26	6.4.27	2	6.4.26		1	6.4.26		2	6.4.26	
35	2	6.2.4	6.4.8	2	6.4.8	6.2.4		2	6.2.4	6.4.8	2	6.2.4	6.4.8	2	6.4.8	6.2.4	3	6.2.4		2	6.2.4	6.4.5	3	6.2.4	6.4.8
36	1	6.3.1		1	6.5.1			2	6.5		2	6.3.1		1	6.3.1		1	6.4.21		1	6.5		1	6.2	
37	2	6.3.3		2	6.2.7	6.4.26	6.4.27	2	6.4.27		2	6.4.27		2	6.4.26	6.4.5	2	6.4.25		2	6.3.3		3	6.3.3	
38	1	6.5.2		2	6.4.16			2	6.4.16		2	6.5.2		1	6.4.16		1	6.5.2		1	6.4.16		2	6.2.2	
39	2	6.4.16		2	6.2.6	6.4.16		2	6.2.8	6.2.1	2	6.4.16		2	6.4.20		2	6.4.10		2	6.3.4	6.4.16	2	6.4.20	
40	2	6.2.7		2	6.6.1			2	6.6.3		2	6.3.1		2	6.6.5	6.6.3	2	6.6.3		3	6.2.7	6.4.9	3	6.2.2	6.4.9
41	1	6.4.19		1	6.4.18			2	6.4.18		1	6.5.2		1	6.4.18	6.4.19	1	6.4.19		1	6.4.19		1	6.4.18	
42	2	6.2.3		1	6.1.1			1	6.2.4	6.1.2	1	6.1.4		1	6.1.2		2	6.4.29		1	6.1.4		1	6.1.2	
43	1	6.2.4		1	6.2.4			1	6.2.4		1	6.2.4		1	6.2.4		1	6.2.4		1	6.2.4		1	6.2.9	
44	2	6.4.26		1	6.4.26			2	6.4.27	6.4.26	1	6.4.26		1	6.4.26	6.2.7	2	6.2.8		1	6.4.26		2	6.4.26	
45	1	6.4.11		2	6.2.7			2			1	6.2.7		2	6.4.16	6.2.7	2	6.2.7		2	6.2.2		2	6.2.7	
46	1	6.4.11		2	6.4.11			2	6.4.11		1	6.4.11		1	6.4.11		1	6.4.10		1	6.4.11		1	6.4.11	
47	2	6.4.29		1	6.4.29			2	6.4.29		2	6.4.29		2	6.4.29	6.2.7	1	6.4.29		1	6.4.28		2	6.2.7	
48	1	6.2.5		1	6.2.5			1	6.2.5		1	6.2.5		1	6.4.17	6.2.5	1	6.2.5		1	6.4.16		1	6.5.2	
49	2	6.2.6		2	6.4.2	6.2.6		2	6.2.6		2	6.2.6		2	6.2.6		2	6.2.6		2	6.2.2		2	6.4	
50	1	6.4.6		2	6.4.6			1	6.4.6		1	6.4.6		2	6.4.6		2	6.4.6		1	6.4.6		2	6.4.6	

Table 6.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 6 Science—November 2003

Low		Medium		High
7		8.94		15

1:	6.1.2	6.1.4	6.1.4	6.1.4	6.1.4	6.1.4	6.1.4	6.1.4			
2:	6.2.4	6.4	6.4	6.4	6.4	6.4.3	6.4.3	6.4.3			
3:	6.2.7	6.2.8	6.4.5	6.4.18	6.4.18	6.4.18	6.4.18	6.4.18	6.4.18		
4:	6.2.4	6.2.4	6.2.4	6.2.4	6.2.4	6.2.4	6.2.4	6.2.4			
5:	6.2.4	6.2.6	6.2.8	6.3.1	6.4.5	6.4.5	6.4.8	6.4.8	6.4.8	6.4.8	
6:	6.1.4	6.1.4	6.1.4	6.2.8	6.2.8	6.2.8	6.4.8	6.6.1	6.6.3		
7:	6.2.7	6.2.7	6.2.7	6.3.2	6.3.2	6.4.29	6.4.29	6.4.29	6.4.29	6.4.29	6.4.29
8:	6.4.23	6.4.23	6.4.23	6.4.23	6.4.23	6.4.23	6.4.23				
9:	6.2	6.2.7	6.2.7	6.2.7	6.2.7	6.2.7	6.2.7	6.2.8	6.2.8		
10:	6.4	6.4.2	6.4.3	6.4.3	6.4.3	6.4.3	6.4.3	6.4.4			
11:	6.1.1	6.2	6.2.2	6.2.2	6.2.3	6.2.6	6.2.6	6.2.8	6.2.8		
12:	6.2.8	6.4.8	6.4.8	6.4.8	6.4.9	6.4.9	6.4.9	6.4.9	6.4.9	6.4.9	6.4.9
13:	6.1	6.1.1	6.1.1	6.1.3	6.1.4	6.1.4	6.1.4	6.1.4	6.4.5		
14:	6.4	6.4	6.4	6.4	6.4	6.4	6.4.22	6.4.30			
15:	6.4.16	6.5.1	6.5.2	6.5.2	6.5.2	6.5.2	6.5.2	6.6.1	6.6.3	6.6.5	
16:	6.2.4	6.2.4	6.2.7	6.2.8	6.2.8	6.4.16	6.4.17	6.4.24			
17:	6.4	6.4.17	6.4.18	6.4.18	6.4.18	6.5.1	6.5.2	6.5.2			
18:	6.4.18	6.4.19	6.4.25	6.4.29	6.4.30	6.4.30	6.4.30	6.4.30			
19:	6.2.1	6.2.2	6.2.6	6.2.6	6.2.6	6.2.6	6.2.6	6.2.6	6.4.7		
20:	6.3.4	6.4.10	6.4.15	6.4.16	6.4.16	6.4.16	6.4.16	6.4.16			
21:	6.2.2	6.2.6	6.2.6	6.2.6	6.2.6	6.2.6	6.2.8	6.2.8	6.4.7	6.4.7	
22:	6.2.7	6.2.7	6.2.7	6.2.7	6.2.7	6.2.7	6.2.7	6.2.7			

Table 6.9 (continued)
Objectives Coded to Each Item by Reviewers
West Virginia Grade 6 Science—November 2003

23:	6.2	6.2.7	6.2.7	6.2.7	6.2.7	6.3.2	6.4	6.4	6.4.10						
24:	6.2.7	6.4.26	6.4.26	6.4.26	6.4.26	6.4.26	6.4.26	6.4.26							
25:	6.2.7	6.2.7	6.2.7	6.2.7	6.2.7	6.2.7	6.2.7	6.2.8							
26:	6.4.10	6.4.10	6.4.10	6.4.10	6.4.10	6.4.10	6.4.10	6.4.16							
27:	6.4.9	6.4.9	6.6.1	6.6.1	6.6.3	6.6.3	6.6.3	6.6.3							
28:	6.1.4	6.1.4	6.2.8	6.6.5	6.6.5	6.6.5	6.6.5	6.6.5	6.6.5						
29:	6.4	6.4	6.4	6.4	6.4.9	6.4.9	6.4.9	6.4.9							
30:	6.3.1	6.4.1	6.4.2	6.4.2	6.4.3	6.4.9	6.4.9	6.4.9							
31:	6.2.7	6.2.7	6.2.8	6.2.8	6.2.8	6.4.16	6.4.16	6.4.16	6.4.16						
32:	6.2.3	6.2.7	6.2.7	6.2.7	6.2.7	6.2.7	6.2.8	6.2.8	6.4.1	6.4.8	6.5.2				
33:	6.4.27	6.4.27	6.4.27	6.4.27	6.4.27	6.4.27	6.4.27	6.4.27							
34:	6.4.26	6.4.26	6.4.26	6.4.26	6.4.26	6.4.26	6.4.26	6.4.27	6.4.27						
35:	6.2.4	6.2.4	6.2.4	6.2.4	6.2.4	6.2.4	6.2.4	6.2.4	6.4.5	6.4.8	6.4.8	6.4.8	6.4.8	6.4.8	6.4.8
36:	6.2	6.3.1	6.3.1	6.3.1	6.4.21	6.5	6.5	6.5.1							
37:	6.2.7	6.3.3	6.3.3	6.3.3	6.4.5	6.4.25	6.4.26	6.4.26	6.4.27	6.4.27	6.4.27				
38:	6.2.2	6.4.16	6.4.16	6.4.16	6.4.16	6.5.2	6.5.2	6.5.2							
39:	6.2.1	6.2.6	6.2.8	6.3.4	6.4.10	6.4.16	6.4.16	6.4.16	6.4.16	6.4.20	6.4.20				
40:	6.2.2	6.2.7	6.2.7	6.3.1	6.4.9	6.4.9	6.6.1	6.6.3	6.6.3	6.6.3	6.6.5				
41:	6.4.18	6.4.18	6.4.18	6.4.18	6.4.19	6.4.19	6.4.19	6.4.19	6.5.2						
42:	6.1.1	6.1.2	6.1.2	6.1.2	6.1.4	6.1.4	6.2.3	6.2.4	6.4.29						
43:	6.2.4	6.2.4	6.2.4	6.2.4	6.2.4	6.2.4	6.2.4	6.2.9							
44:	6.2.7	6.2.8	6.4.26	6.4.26	6.4.26	6.4.26	6.4.26	6.4.26	6.4.26	6.4.27					
45:	6.2.2	6.2.7	6.2.7	6.2.7	6.2.7	6.2.7	6.4.11	6.4.16							
46:	6.4.10	6.4.11	6.4.11	6.4.11	6.4.11	6.4.11	6.4.11	6.4.11							

Table 6.9 (continued)
Objectives Coded to Each Item by Reviewers
West Virginia Grade 6 Science—November 2003

47:	6.2.7	6.2.7	6.4.28	6.4.29	6.4.29	6.4.29	6.4.29	6.4.29	6.4.29
48:	6.2.5	6.2.5	6.2.5	6.2.5	6.2.5	6.2.5	6.4.16	6.4.17	6.5.2
49:	6.2.2	6.2.6	6.2.6	6.2.6	6.2.6	6.2.6	6.2.6	6.4	6.4.2
50:	6.4.6	6.4.6	6.4.6	6.4.6	6.4.6	6.4.6	6.4.6	6.4.6	

Table 6.10
Items Coded by Reviewers to Each Objective
West Virginia Grade 6 Science—November 2003

Low		Medium		High
0		7.327869		49

root:																																																	
6.1:	13																																																
6.1.1:	11	13	13	42																																													
6.1.2:	1	42	42	42																																													
6.1.3:	13																																																
6.1.4:	1	1	1	1	1	1	1	6	6	6	13	13	13	13	28	28	42	42																															
6.2:	9	11	23	36																																													
6.2.1:	19	39																																															
6.2.2:	11	11	19	21	38	40	45	49																																									
6.2.3:	11	32	42																																														
6.2.4:	2	4	4	4	4	4	4	4	4	5	16	16	35	35	35	35	35	35	35	35	42	43	43	43	43	43	43	43																					
6.2.5:	48	48	48	48	48	48																																											
6.2.6:	5	11	11	19	19	19	19	19	19	21	21	21	21	21	39	49	49	49	49	49	49																												
6.2.7:	3	7	7	7	9	9	9	9	9	9	16	22	22	22	22	22	22	22	22	23	23	23	23	24	25	25	25	25	25	25	25	31	31	32	32	32	32	32	37	40	40	44	45	45	45	45	45	47	47
6.2.8:	3	5	6	6	6	9	9	11	11	12	16	16	21	21	25	28	31	31	31	32	32	39	44																										
6.2.9:	43																																																
6.3:																																																	
6.3.1:	5	30	36	36	36	40																																											
6.3.2:	7	7	23																																														
6.3.3:	37	37	37																																														

Table 6.10 (continued)
Items Coded by Reviewers to Each Objective
West Virginia Grade 6 Science—November 2003

6.3.4:	20	39																				
6.4:	2	2	2	2	10	14	14	14	14	14	14	17	23	23	29	29	29	29	49			
6.4.1:	30	32																				
6.4.2:	10	30	30	49																		
6.4.3:	2	2	2	10	10	10	10	10	30													
6.4.4:	10																					
6.4.5:	3	5	5	13	35	37																
6.4.6:	50	50	50	50	50	50	50	50														
6.4.7:	19	21	21																			
6.4.8:	5	5	5	5	6	12	12	12	32	35	35	35	35	35	35							
6.4.9:	12	12	12	12	12	12	12	27	27	29	29	29	29	30	30	30	40	40				
6.4.10:	20	23	26	26	26	26	26	26	26	39	46											
6.4.11:	45	46	46	46	46	46	46	46														
6.4.12:																						
6.4.13:																						
6.4.14:																						
6.4.15:	20																					
6.4.16:	15	16	20	20	20	20	20	26	31	31	31	31	38	38	38	38	39	39	39	39	45	48
6.4.17:	16	17	48																			
6.4.18:	3	3	3	3	3	3	17	17	17	18	41	41	41	41								
6.4.19:	18	41	41	41	41																	
6.4.20:	39	39																				
6.4.21:	36																					
6.4.22:	14																					

Table 6.10 (continued)
Items Coded by Reviewers to Each Objective
West Virginia Grade 6 Science—November 2003

6.4.23:	8	8	8	8	8	8	8																
6.4.24:	16																						
6.4.25:	18	37																					
6.4.26:	24	24	24	24	24	24	24	34	34	34	34	34	34	34	37	37	44	44	44	44	44	44	44
6.4.27:	33	33	33	33	33	33	33	33	34	34	37	37	37	44									
6.4.28:	47																						
6.4.29:	7	7	7	7	7	7	18	42	47	47	47	47	47	47									
6.4.30:	14	18	18	18	18																		
6.5:	36	36																					
6.5.1:	15	17	36																				
6.5.2:	15	15	15	15	15	17	17	32	38	38	38	41	48										
6.6:																							
6.6.1:	6	15	27	27	40																		
6.6.2:																							
6.6.3:	6	15	27	27	27	27	40	40	40														
6.6.4:																							
6.6.5:	15	28	28	28	28	28	28	40															

Table 6.11

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

West Virginia Grade 6 Science—November 2003

One Reviewer		50 % of Reviewers		All Reviewers
1		4		8

root:															
6.1:	13:1														
6.1.1:	11:1	13:2	42:1												
6.1.2:	1:1	42:3													
6.1.3:	13:1														
6.1.4:	1:7	6:3	13:4	28:2	42:2										
6.2:	9:1	11:1	23:1	36:1											
6.2.1:	19:1	39:1													
6.2.2:	11:2	19:1	21:1	38:1	40:1	45:1	49:1								
6.2.3:	11:1	32:1	42:1												
6.2.4:	2:1	4:8	5:1	16:2	35:8	42:1	43:7								
6.2.5:	48:6														
6.2.6:	5:1	11:2	19:6	21:5	39:1	49:6									
6.2.7:	3:1	7:3	9:6	16:1	22:8	23:4	24:1	25:7	31:2	32:5	37:1	40:2	44:1	45:5	47:2
6.2.8:	3:1	5:1	6:3	9:2	11:2	12:1	16:2	21:2	25:1	28:1	31:3	32:2	39:1	44:1	
6.2.9:	43:1														
6.3:															
6.3.1:	5:1	30:1	36:3	40:1											
6.3.2:	7:2	23:1													
6.3.3:	37:3														
6.3.4:	20:1	39:1													

Table 6.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 6 Science—November 2003

6.4:	2:4	10:1	14:6	17:1	23:2	29:4	49:1		
6.4.1:	30:1	32:1							
6.4.2:	10:1	30:2	49:1						
6.4.3:	2:3	10:5	30:1						
6.4.4:	10:1								
6.4.5:	3:1	5:2	13:1	35:1	37:1				
6.4.6:	50:8								
6.4.7:	19:1	21:2							
6.4.8:	5:4	6:1	12:3	32:1	35:6				
6.4.9:	12:7	27:2	29:4	30:3	40:2				
6.4.10:	20:1	23:1	26:7	39:1	46:1				
6.4.11:	45:1	46:7							
6.4.12:									
6.4.13:									
6.4.14:									
6.4.15:	20:1								
6.4.16:	15:1	16:1	20:5	26:1	31:4	38:4	39:4	45:1	48:1
6.4.17:	16:1	17:1	48:1						
6.4.18:	3:6	17:3	18:1	41:4					
6.4.19:	18:1	41:4							
6.4.20:	39:2								
6.4.21:	36:1								
6.4.22:	14:1								
6.4.23:	8:7								

Table 6.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 6 Science—November 2003

6.4.24:	16:1					
6.4.25:	18:1	37:1				
6.4.26:	24:7	34:7	37:2	44:7		
6.4.27:	33:8	34:2	37:3	44:1		
6.4.28:	47:1					
6.4.29:	7:6	18:1	42:1	47:6		
6.4.30:	14:1	18:4				
6.5:	36:2					
6.5.1:	15:1	17:1	36:1			
6.5.2:	15:5	17:2	32:1	38:3	41:1	48:1
6.6:						
6.6.1:	6:1	15:1	27:2	40:1		
6.6.2:						
6.6.3:	6:1	15:1	27:4	40:3		
6.6.4:						
6.6.5:	15:1	28:6	40:1			

Table 7.1
Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 7 Science--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.	
7.1 - History/Nature	4	4.25	1	4	100	3.75	1.20	NO
7.2 - Inquiry	9	9	1 2 3	2 2 5	22 22 55	17.38	4.12	YES
7.3 - Unifying Themes	4	4.12	2	4	100	3	1.22	NO
7.4 - Subj Matter/Conc	33	33.88	1 2	15 18	45 54	26	3.77	YES
7.5 - Design/Applic	2	2.25	2 3	1 1	50 50	2	0.71	NO
7.6 - Personal/Social	5	5.5	2 3	1 4	20 80	7.38	2.87	YES
Total	57	59	1 2 3	21 26 10	36 45 17	58	8.41	

Table 7.2
Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 7 Science—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.	
7.1 - History/Nature	4	4.25	3.75	1.20	0	0	91	24	9	24	YES
7.2 - Inquiry	9	9	17.38	4.12	59	45	29	39	12	27	WEAK
7.3 - Unifying Themes	4	4.12	3	1.22	45	42	55	42	0	0	YES
7.4 - Subj Matter/Conc	33	33.88	26	3.77	34	44	45	45	21	39	YES
7.5 - Design/Applic	2	2.25	2	0.71	71	43	29	43	0	0	NO
7.6 - Personal/Social	5	5.5	7.38	2.87	98	9	2	9	0	0	NO
Total	57	59	58	8.41	45	47	41	45	14	33	

Table 7.3
Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 7 Science—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.	
7.1 - History/Nature	4	4.25	3.75	1.20	2.5	0.87	58	17	YES	7	2	0.89	0.12	YES
7.2 - Inquiry	9	9	17.38	4.12	6	1	67	11	YES	30	4	0.75	0.09	YES
7.3 - Unifying Themes	4	4.12	3	1.22	1.75	0.43	42	13	WEAK	5	2	0.90	0.11	YES
7.4 - Subj Matter/Conc	33	33.88	26	3.77	16.88	2.57	50	8	YES	45	6	0.77	0.04	YES
7.5 - Design/Applic	2	2.25	2	0.71	1.5	0.5	69	26	YES	3	1	0.96	0.07	YES
7.6 - Personal/Social	5	5.5	7.38	2.87	3.38	1.11	61	20	YES	13	5	0.82	0.06	YES
Total	57	59	58	8.41	5.33	5.66	58	19		17	16	0.85	0.11	

Table 7.4
Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers
West Virginia Grade 7 Science—November 2003
Number of Assessment Items–49

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
7.1 - History/Nature	NO	YES	YES	YES
7.2 - Inquiry	YES	WEAK	YES	YES
7.3 - Unifying Themes	NO	YES	WEAK	YES
7.4 - Subj Matter/Conc	YES	YES	YES	YES
7.5 - Design/Applic	NO	NO	YES	YES
7.6 - Personal/Social	YES	NO	YES	YES

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

Item Number	Comments by Reviewer
2	Correct answer longest choice
	Correct answer is much longer
3	Students must know which are gases & there is no 7th grade standard for knowing gaseous substances.
5	Distractor #1 could be too confusing for those knowing exothermic
7	Too much reading!
8	Primary obj.: There has been no standard on F=ma in grades 3-7. It is not stated until 10th grade. Second obj.: Force & motion
23	cs does address genes - reproduction
	Correct answer is the longest
27	2 possible answers: proper food--refrigerated - non-refr.
34	Reading challenge (amount of reading)

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

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

Table 7.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 7 Science—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	1	1	1	1	1	1	1	2
24	1	1	1	1	1	1	1	1
25	1	1	1	1	1	1	1	2
26	1	1	2	1	1	1	2	2
27	2	2	2	1	1	2	1	1
28	1	1	1	2	1	2	1	2
29	1	1	1	1	1	1	1	2
30	1	1	1	1	1	1	1	1
31	1	1	1	2	2	1	1	2
32	1	1	2	1	1	2	2	2
33	1	2	2	1	2	1	1	2
34	2	2	2	1	2	1	2	2
35	2	2	2	2	2	1	2	3
36	1	2	1	1	1	2	1	2
37	2	1	1	1	1	1	1	2
38	2	2	2	2	2	1	2	2
39	2	2	2	2	2	1	2	3
40	1	1	1	2	2	1	2	2
41	1	1	1	1	1	1	1	1

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

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	2	1	1	1	1	1	1	2
43	2	1	2	1	2	2	2	2
44	2	2	2	2	2	2	1	2
45	1	1	1	1	1	1	2	1
46	1	1	2	1	2	1	2	2
47	2	2	2	2	2	1	2	3
48	2	2	2	3	2	2	3	3
49	2	3	2	2	2	2	3	3
Intraclass Corr Grade 7 Science					0.826			

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

Item Number	Comments by Reviewer
1	No construction
2	Reviewer put question mark after primary object)
3	(After second obj. Reviewer put: structure of prop. of matter)
	Structure and properties of matter
	No construction
5	Chemistry
	Better match to earlier grade level standard.
	Chemical reactions better for grade 6 objective
	(After primary obj. Reviewer put: chemical reactions)
9	No construction
10	#10 & 11: better matches to earlier grades objectives
11	Better match to earlier grade stand.
13	1st half of objective only, not influence of societal pressure only art of objective - just skeletal

Table 7.7(continued)
Notes by Reviewer
West Virginia Grade 7 Science—November 2003

Item Number	Comments by Reviewer
15	No construction (7.2.7)
17	Better match to earlier grades objectives--"looking like parents"
	Better match to earlier grade standard.
	(After primary obj. Reviewer put: Life cycles of org. Reproduction & heredity)
	Heredity
18	A stretch
19	Better match to earlier grades objective-"looking like parents"
20	Structure/properties of matter. Better obj of earlier grade.
21	Better obj. Of earlier grades. Populations/Ecosystems
	(After primary obj. Reviewer put: populations & ecosystems)
	Better match in earlier grade (food web/chain)
	Better match to earlier grade stand. (G.L.S)
23	Better match to earlier grade level standards

Table 7.7(continued)
Notes by Reviewer
West Virginia Grade 7 Science—November 2003

Item Number	Comments by Reviewer
23	Heredity
	Life cycles/hereotty
	Heredity
24	Atmospheric layers
26	Very weak match
28	No construction
29	Better match to earlier G.L.S.
38	(After primary obj. Reviewer put: Energy)
42	Debatable answers
44	Structure/properties of matter
	Prop. of matter - Better match to earlier G.L.S.

Table 7.8
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewer
Grade 7 Science—November 2003
West Virginia

Item	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	S2Obj	DOK	PObj	S2Obj	DOK	PObj	S1Obj	S2Obj	DOK	PObj	S1Ob	DOK	PObj	S1Obj	DOK	PObj
1	1	7.2.7		2	7.2.7		1	7.2.7			2	7.2.7		2	7.2.7			1	7.2.7		1	7.2.7		2	7.2.9
2	1	7.2.9		1	7.1.1		2	7.1			1	7.2.3		1				1	7.2.2		1	7.2.3		1	7.2.2
3	2	7.2.7	7.4	1	7.2.7		1	7.2.7			2	7.2.7		2	7.4.19	7.2.7		1	7.2.7		2	7.2.7	7.4	1	7.4.19
4	2	7.4.11		1	7.4.11		2	7.4.11			1	7.4.11		1	7.4.11			1	7.4.6		1	7.4.11		2	7.4.1
5	2	7.4		2	7.4		2	7.4.14			2	7.4		2	7.4.15			2	7.4.15		1	7.4		1	7.4.18
6	1	7.4.7		1	7.4.7		2	7.4.7			1	7.4.7		1	7.4.7			1	7.4.7		1	7.4.7		1	7.4.7
7	1	7.2.1		1	7.2.6		2	7.2.6	7.4.23		1	7.2.6		1	7.2.6			2	7.2.6	7.4.23	1	7.2.6		1	7.2.2
8	1	7.4.22		1	7.2.6		1	7.2.6			1	7.2.6	7.4	1	7.4.23			1	7.5.2		1	7.2.6		1	7.4.23
9	1	7.2.7		1	7.2.7		1	7.2.7			2	7.2.7		1	7.2.7			1	7.2.7		1	7.2.7		1	7.2.9
10	1	7.6.3		1	7.6		1	7.6.1	7.6.3	7.6.5	1	7.6.3		1	7.6.3	7.4.12		1	7.6.3		1	7.6.1		1	7.6.5
11	1	7.6		1	7.6		1	7.6.1			1	7.6		1	7.6.3			1	7.3.3		1	7.6.1		1	7.6.1
12	1	7.5.2		1	7.5		1	7.5.2	7.1.4		1	7.1.3		2	7.5.2	7.1.3	7.2.7	1	7.1.3		2	7.5.2		1	7.1.4
13	1	7.4.19		2	7.6.5		1	7.2.5			1	7.5.1		1	7.6.5			2	7.4.19		1	7.6.5		2	7.5.1
14	1	7.4.3		1	7.4.3		1	7.4.3			1	7.4.3		1	7.4.3			1	7.4.3		1	7.4.3		1	7.4.3
15	2	7.4.30		1	7.4.30	7.2.7	3	7.4.30			2	7.4.30		1	7.4.30	7.2.7		1	7.4.30		1	7.4.30		1	7.4.30
16	2	7.2.3		2	7.2.6		2	7.2.1	7.4.10		1	7.2.6		2	7.2.6			1	7.4.7		2	7.2.6		2	7.2.2
17	1	7.4.9		1	7.4		1	7.4			1	7.4		1	7.4			2	7.4.9		1	7.4		2	7.4
18	2	7.2.3		1	7.2.4		1	7.2.4			1	7.2.4		1	7.5.2			1	7.4.20	7.2.8	1	7.5		1	7.2.8
19	2	7.4.29		2	7.4.29		1	7.4.29			1	7.4.29		2	7.4.29	7.2.6		2	7.4.29		2	7.2.9		1	7.4.29
20	1	7.4		1	7.4.27		2	7.4.27	7.4.30		2	7.4.27		2	7.4.27	7.4.26		1	7.4.30		2	7.4.27		1	7.4.27
21	1	7.4		1	7.4		1	7.2.9			1	7.4		1	7.3.1	7.2.7		1	7.4.7	7.3.1	1	7.4		1	7.2.7
22	1	7.1.3		1	7.1.3		1	7.1.3	7.6.4		1	7.6.4		1	7.1.3			1	7.1.3		1	7.1.3		1	7.1.3
23	1	7.4		1	7.4		1	7.2.9	7.4		1	7.4		1	7.6.5			1	7.4.9	7.4.7	1	7.4		2	7.4
24	1	7.4.27		1	7.4	7.4.1	1	7.4.12			1	7.6.3		1	7.4.12			1	7.4.12		1	7.6.1		1	7.6.5
25	1	7.4.33		1	7.4.33		1	7.4.33			1	7.4.32		1	7.4.32			1	7.4.33	7.4.32	1	7.4		2	7.4.32
26	1	7.4.24		1	7.4.24		2	7.4.24			1	7.4.24		1	7.4.24			1	7.4.24		2	7.4.24		2	7.4.24
27	2	7.6		2	7.6.5		2	7.4.2	7.6.3		1	7.6.3		1	7.6.5	7.4.2		2	7.4.2		1	7.4.2		1	7.6.5

Table 7.8 (continued)
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewer
Grade 7 Science—November 2003
West Virginia

Item	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	S2Obj	DOK	PObj	DOK	PObj	S1Obj	S2Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	S2Obj	DOK	PObj	S1Obj
28	1	7.2.7		1	7.2.7		1	7.2.7			2	7.2.7	1	7.2.7			2	7.4.13	7.2.7	1	7.2.7			2	7.2.2	
29	1	7.2.4		1	7.1.4		1	7.2.4			1	7.1	1	7.1.2			1	7.4.20		1	7.1.4			2	7.2.8	
30	1	7.4.2		1	7.1.4		1	7.6.1			1	7.1.4	1				1	7.1.4		1	7.1.4			1	7.1.4	
31	1	7.2.7		1	7.3.1		1	7.4.6	7.4.12		2	7.6.1	2	7.4.12	7.4.6	7.2.7	1	7.4.12		1	7.2.7	7.4.6		2	7.6	
32	1	7.4.20		1	7.4.20		2	7.2.4	7.4.20		1	7.4.20	1	7.4.20	7.2.7		2	7.4.20		2	7.4.20			2	7.4.20	
33	1	7.6.1		2	7.6.5		2	7.6.3	7.6.1		1	7.6.3	2	7.6.3	7.6.5		1	7.5.2		1	7.6.5			2	7.6.5	
34	2	7.2.9		2	7.6.2		2	7.6.2			1	7.6.2	2	7.4.12	7.6.5	7.5.1	1	7.6.2		2	7.2.2			2	7.6.3	7.4.2
35	2	7.2.9		2	7.6.2		2	7.6.2			2	7.6.2	2	7.4.12	7.6.1	7.6.5	1	7.6.3		2	7.2.2			3	7.4.2	7.6.3
36	1	7.4.32		2	7.4.32		1	7.4.32			1	7.4.32	1	7.4.32			2	7.4.32		1	7.4.32			2	7.4.33	
37	2	7.4.4		1	7.4.4	7.3.1	1	7.4.4			1	7.4.4	1	7.4.4			1	7.4.4		1	7.4.4			2	7.4.4	
38	2	7.4.18		2	7.4.1		2	7.4.27			2	7.6.1	2	7.3.4			1	7.4.10		2	7.4			2	7.5.1	
39	2	7.4.11		2	7.3.1	7.4.9	2	7.4.11			2	7.4.11	2	7.4.11	7.3.1		1	7.3.1	7.4.7	2	7.4.7	7.4.11		3	7.4.11	
40	1	7.4.2		1	7.4.2		1	7.4.2	7.2.7		2	7.4.2	2	7.4.2	7.2.7		1	7.3.3	7.4.2	2	7.4.2			2	7.3	
41	1	7.2.5		1	7.2.5		1	7.2.5			1	7.5.2	1	7.2.5			1	7.2.5		1	7.2.5			1	7.2.5	
42	2	7.4.33		1	7.1.4		1	7.4.32	7.2.4		1	7.1.2	1	7.1.2	7.1.4		1	7.1.4		1	7.1.4			2	7.1.4	
43	2	7.2.9	7.4.33	1	7.2.9		2	7.2.1	7.2.2		1	7.2.9	2	7.2.9			2	7.4.33		2	7.2.9			2	7.6	7.4.1
44	2	7.4		2	7.3.2		2	7.4.27			2	7.4	2	7.4.27	7.2.6	7.2.7	2	7.2.6		1	7.4.27			2	7.4	
45	1	7.2.5	7.4	1	7.4	7.2.5	1	7.2.5			1	7.2.5	1	7.2.5	7.4.12	7.2.7	1	7.2.5		2	7.2.5			1	7.2.5	
46	1	7.4.17		1	7.4.17		2	7.2.9			1	7.4.17	2	7.4.17	7.2.7	7.2.4	1	7.2.7		2	7.4.22			2	7.4.22	
47	2	7.4.32		2	7.2.7	7.4.32	2	7.4.32			2	7.4.32	2	7.4.32	7.4.33	7.2.7	1	7.2.8		2	7.4.32			3	7.2.7	
48	2	7.2.4		2	7.2.4		2	7.2.1	7.2.6	7.2.9	3	7.2.8	2	7.2.4			2	7.2.6		3	7.2.4	7.2.6	7.5.2	3	7.2.8	
49	2	7.2.6		3	7.2.6		2	7.5.1	7.2.6		2	7.2.6	2	7.4.10	7.2.6		2	7.4.10	7.2.6	3	7.2.6			3	7.2.9	

Table 7.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 7 Science—November 2003

Low		Medium		High
7		9.469388		12

1:	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.9			
2:	7.1	7.1.1	7.2.2	7.2.2	7.2.3	7.2.3	7.2.9				
3:	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.4	7.4	7.4.19	7.4.19
4:	7.4.1	7.4.6	7.4.11	7.4.11	7.4.11	7.4.11	7.4.11	7.4.11			
5:	7.4	7.4	7.4	7.4	7.4.14	7.4.15	7.4.15	7.4.18			
6:	7.4.7	7.4.7	7.4.7	7.4.7	7.4.7	7.4.7	7.4.7	7.4.7			
7:	7.2.1	7.2.2	7.2.6	7.2.6	7.2.6	7.2.6	7.2.6	7.2.6	7.4.23	7.4.23	
8:	7.2.6	7.2.6	7.2.6	7.2.6	7.4	7.4.22	7.4.23	7.4.23	7.5.2		
9:	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.9			
10:	7.4.12	7.6	7.6.1	7.6.1	7.6.3	7.6.3	7.6.3	7.6.3	7.6.3	7.6.5	7.6.5
11:	7.3.3	7.6	7.6	7.6	7.6.1	7.6.1	7.6.1	7.6.3			
12:	7.1.3	7.1.3	7.1.3	7.1.4	7.1.4	7.2.7	7.5	7.5.2	7.5.2	7.5.2	7.5.2
13:	7.2.5	7.4.19	7.4.19	7.5.1	7.5.1	7.6.5	7.6.5	7.6.5			
14:	7.4.3	7.4.3	7.4.3	7.4.3	7.4.3	7.4.3	7.4.3	7.4.3			
15:	7.2.7	7.2.7	7.4.30	7.4.30	7.4.30	7.4.30	7.4.30	7.4.30	7.4.30	7.4.30	
16:	7.2.1	7.2.2	7.2.3	7.2.6	7.2.6	7.2.6	7.2.6	7.4.7	7.4.10		
17:	7.4	7.4	7.4	7.4	7.4	7.4	7.4.9	7.4.9			
18:	7.2.3	7.2.4	7.2.4	7.2.4	7.2.8	7.2.8	7.4.20	7.5	7.5.2		
19:	7.2.6	7.2.9	7.4.29	7.4.29	7.4.29	7.4.29	7.4.29	7.4.29	7.4.29		
20:	7.4	7.4.26	7.4.27	7.4.27	7.4.27	7.4.27	7.4.27	7.4.27	7.4.30	7.4.30	
21:	7.2.7	7.2.7	7.2.9	7.3.1	7.3.1	7.4	7.4	7.4	7.4	7.4.7	
22:	7.1.3	7.1.3	7.1.3	7.1.3	7.1.3	7.1.3	7.1.3	7.6.4	7.6.4		

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

23:	7.2.9	7.4	7.4	7.4	7.4	7.4	7.4	7.4.7	7.4.9	7.6.5		
24:	7.4	7.4.1	7.4.12	7.4.12	7.4.12	7.4.27	7.6.1	7.6.3	7.6.5			
25:	7.4	7.4.32	7.4.32	7.4.32	7.4.32	7.4.33	7.4.33	7.4.33	7.4.33			
26:	7.4.24	7.4.24	7.4.24	7.4.24	7.4.24	7.4.24	7.4.24	7.4.24				
27:	7.4.2	7.4.2	7.4.2	7.4.2	7.6	7.6.3	7.6.3	7.6.5	7.6.5	7.6.5		
28:	7.2.2	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.2.7	7.4.13			
29:	7.1	7.1.2	7.1.4	7.1.4	7.2.4	7.2.4	7.2.8	7.4.20				
30:	7.1.4	7.1.4	7.1.4	7.1.4	7.1.4	7.4.2	7.6.1					
31:	7.2.7	7.2.7	7.2.7	7.3.1	7.4.6	7.4.6	7.4.6	7.4.12	7.4.12	7.4.12	7.6	7.6.1
32:	7.2.4	7.2.7	7.4.20	7.4.20	7.4.20	7.4.20	7.4.20	7.4.20	7.4.20	7.4.20		
33:	7.5.2	7.6.1	7.6.1	7.6.3	7.6.3	7.6.3	7.6.5	7.6.5	7.6.5	7.6.5		
34:	7.2.2	7.2.9	7.4.2	7.4.12	7.5.1	7.6.2	7.6.2	7.6.2	7.6.2	7.6.3	7.6.5	
35:	7.2.2	7.2.9	7.4.2	7.4.12	7.6.1	7.6.2	7.6.2	7.6.2	7.6.3	7.6.3	7.6.5	
36:	7.4.32	7.4.32	7.4.32	7.4.32	7.4.32	7.4.32	7.4.32	7.4.33				
37:	7.3.1	7.4.4	7.4.4	7.4.4	7.4.4	7.4.4	7.4.4	7.4.4	7.4.4			
38:	7.3.4	7.4	7.4.1	7.4.10	7.4.18	7.4.27	7.5.1	7.6.1				
39:	7.3.1	7.3.1	7.3.1	7.4.7	7.4.7	7.4.9	7.4.11	7.4.11	7.4.11	7.4.11	7.4.11	7.4.11
40:	7.2.7	7.2.7	7.3	7.3.3	7.4.2	7.4.2	7.4.2	7.4.2	7.4.2	7.4.2	7.4.2	
41:	7.2.5	7.2.5	7.2.5	7.2.5	7.2.5	7.2.5	7.2.5	7.5.2				
42:	7.1.2	7.1.2	7.1.4	7.1.4	7.1.4	7.1.4	7.1.4	7.2.4	7.4.32	7.4.33		
43:	7.2.1	7.2.2	7.2.9	7.2.9	7.2.9	7.2.9	7.2.9	7.4.1	7.4.33	7.4.33	7.6	
44:	7.2.6	7.2.6	7.2.7	7.3.2	7.4	7.4	7.4	7.4.27	7.4.27	7.4.27		
45:	7.2.5	7.2.5	7.2.5	7.2.5	7.2.5	7.2.5	7.2.5	7.2.5	7.2.7	7.4	7.4	7.4.12
46:	7.2.4	7.2.7	7.2.7	7.2.9	7.4.17	7.4.17	7.4.17	7.4.17	7.4.22	7.4.22		

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

47:	7.2.7	7.2.7	7.2.7	7.2.8	7.4.32	7.4.32	7.4.32	7.4.32	7.4.32	7.4.32	7.4.33	
48:	7.2.1	7.2.4	7.2.4	7.2.4	7.2.4	7.2.6	7.2.6	7.2.6	7.2.8	7.2.8	7.2.9	7.5.2
49:	7.2.6	7.2.6	7.2.6	7.2.6	7.2.6	7.2.6	7.2.6	7.2.9	7.4.10	7.4.10	7.5.1	

Table 7.10

Items Coded by Reviewers to Each Objective

West Virginia Grade 7 Science—November 2003

Low		Medium		High
0		7.25		46

root:																																														
7.1:	2	29																																												
7.1.1:	2																																													
7.1.2:	29	42	42																																											
7.1.3:	12	12	12	22	22	22	22	22	22	22																																				
7.1.4:	12	12	29	29	30	30	30	30	30	42	42	42	42	42																																
7.2:																																														
7.2.1:	7	16	43	48																																										
7.2.2:	2	2	7	16	28	34	35	43																																						
7.2.3:	2	2	16	18																																										
7.2.4:	18	18	18	29	29	32	42	46	48	48	48	48																																		
7.2.5:	13	41	41	41	41	41	41	41	45	45	45	45	45	45	45	45																														
7.2.6:	7	7	7	7	7	7	8	8	8	8	16	16	16	16	19	44	44	48	48	48	49	49	49	49	49	49	49																			
7.2.7:	1	1	1	1	1	1	1	3	3	3	3	3	3	3	9	9	9	9	9	9	9	12	15	15	21	21	28	28	28	28	28	28	28	31	31	31	32	40	40	44	45	46	46	47	47	47
7.2.8:	18	18	29	47	48	48																																								
7.2.9:	1	2	9	19	21	23	34	35	43	43	43	43	43	46	48	49																														
7.3:	40																																													
7.3.1:	21	21	31	37	39	39	39																																							
7.3.2:	44																																													
7.3.3:	11	40																																												

Table 7.10 (continued)
Items Coded by Reviewers to Each Objective
West Virginia Grade 7 Science—November 2003

7.3.4:	38																															
7.4:	3	3	5	5	5	5	8	17	17	17	17	17	17	20	21	21	21	21	23	23	23	23	23	23	24	25	38	44	44	44	45	45
7.4.1:	4	24	38	43																												
7.4.2:	27	27	27	27	30	34	35	40	40	40	40	40	40	40																		
7.4.3:	14	14	14	14	14	14	14	14																								
7.4.4:	37	37	37	37	37	37	37	37																								
7.4.5:																																
7.4.6:	4	31	31	31																												
7.4.7:	6	6	6	6	6	6	6	6	16	21	23	39	39																			
7.4.8:																																
7.4.9:	17	17	23	39																												
7.4.10:	16	38	49	49																												
7.4.11:	4	4	4	4	4	4	39	39	39	39	39	39																				
7.4.12:	10	24	24	24	31	31	31	34	35	45																						
7.4.13:	28																															
7.4.14:	5																															
7.4.15:	5	5																														
7.4.16:																																
7.4.17:	46	46	46	46																												
7.4.18:	5	38																														
7.4.19:	3	3	13	13																												
7.4.20:	18	29	32	32	32	32	32	32	32	32																						
7.4.21:																																
7.4.22:	8	46	46																													

Table 7.10 (continued)
Items Coded by Reviewers to Each Objective
West Virginia Grade 7 Science—November 2003

7.4.23:	7	7	8	8														
7.4.24:	26	26	26	26	26	26	26	26										
7.4.25:																		
7.4.26:	20																	
7.4.27:	20	20	20	20	20	20	24	38	44	44	44							
7.4.28:																		
7.4.29:	19	19	19	19	19	19	19											
7.4.30:	15	15	15	15	15	15	15	15	20	20								
7.4.31:																		
7.4.32:	25	25	25	25	36	36	36	36	36	36	36	42	47	47	47	47	47	47
7.4.33:	25	25	25	25	36	42	43	43	47									
7.5:	12	18																
7.5.1:	13	13	34	38	49													
7.5.2:	8	12	12	12	12	18	33	41	48									
7.6:	10	11	11	11	27	31	43											
7.6.1:	10	10	11	11	11	24	30	31	33	33	35	38						
7.6.2:	34	34	34	34	35	35	35											
7.6.3:	10	10	10	10	10	11	24	27	27	33	33	33	34	35	35			
7.6.4:	22	22																
7.6.5:	10	10	13	13	13	23	24	27	27	27	33	33	33	33	34	35		

Table 7.11

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

West Virginia Grade 7 Science—November 2003

One Reviewer		50 % of Reviewers		All Reviewers
1		4		8

root:														
7.1:	2:1	29:1												
7.1.1:	2:1													
7.1.2:	29:1	42:2												
7.1.3:	12:3	22:7												
7.1.4:	12:2	29:2	30:5	42:5										
7.2:														
7.2.1:	7:1	16:1	43:1	48:1										
7.2.2:	2:2	7:1	16:1	28:1	34:1	35:1	43:1							
7.2.3:	2:2	16:1	18:1											
7.2.4:	18:3	29:2	32:1	42:1	46:1	48:4								
7.2.5:	13:1	41:7	45:8											
7.2.6:	7:6	8:4	16:4	19:1	44:2	48:3	49:7							
7.2.7:	1:7	3:7	9:7	12:1	15:2	21:2	28:7	31:3	32:1	40:2	44:1	45:1	46:2	47:3
7.2.8:	18:2	29:1	47:1	48:2										
7.2.9:	1:1	2:1	9:1	19:1	21:1	23:1	34:1	35:1	43:5	46:1	48:1	49:1		
7.3:	40:1													
7.3.1:	21:2	31:1	37:1	39:3										
7.3.2:	44:1													
7.3.3:	11:1	40:1												
7.3.4:	38:1													

Table 7.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 7 Science—November 2003

7.4:	3:2	5:4	8:1	17:6	20:1	21:4	23:6	24:1	25:1	38:1	44:3	45:2
7.4.1:	4:1	24:1	38:1	43:1								
7.4.2:	27:4	30:1	34:1	35:1	40:7							
7.4.3:	14:8											
7.4.4:	37:8											
7.4.5:												
7.4.6:	4:1	31:3										
7.4.7:	6:8	16:1	21:1	23:1	39:2							
7.4.8:												
7.4.9:	17:2	23:1	39:1									
7.4.10:	16:1	38:1	49:2									
7.4.11:	4:6	39:6										
7.4.12:	10:1	24:3	31:3	34:1	35:1	45:1						
7.4.13:	28:1											
7.4.14:	5:1											
7.4.15:	5:2											
7.4.16:												
7.4.17:	46:4											
7.4.18:	5:1	38:1										
7.4.19:	3:2	13:2										
7.4.20:	18:1	29:1	32:8									
7.4.21:												
7.4.22:	8:1	46:2										
7.4.23:	7:2	8:2										

Table 7.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 7 Science—November 2003

7.4.24:	26:8							
7.4.25:								
7.4.26:	20:1							
7.4.27:	20:6	24:1	38:1	44:3				
7.4.28:								
7.4.29:	19:7							
7.4.30:	15:8	20:2						
7.4.31:								
7.4.32:	25:4	36:7	42:1	47:6				
7.4.33:	25:4	36:1	42:1	43:2	47:1			
7.5:	12:1	18:1						
7.5.1:	13:2	34:1	38:1	49:1				
7.5.2:	8:1	12:4	18:1	33:1	41:1	48:1		
7.6:	10:1	11:3	27:1	31:1	43:1			
7.6.1:	10:2	11:3	24:1	30:1	31:1	33:2	35:1	38:1
7.6.2:	34:4	35:3						
7.6.3:	10:5	11:1	24:1	27:2	33:3	34:1	35:2	
7.6.4:	22:2							
7.6.5:	10:2	13:3	23:1	24:1	27:3	33:4	34:1	35:1

Table 8.1
Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 8 Science—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 - History/Nature	4	4	1	4	100	2.14	0.83	NO
8.2 - Inquiry	9	9.25	1 2 3	2 2 5	22 22 55	15	3.71	YES
8.3 - Unifying Themes	4	4.12	2	4	100	1.88	1.17	NO
8.4 - Subj Matter/Conc	34	34.75	1 2	18 16	52 47	30.75	2.33	YES
8.5 - Design/Applic	4	4.12	1 2 3	1 2 1	25 50 25	2.57	0.73	NO
8.6 - Personal/Social	5	5.25	2 3	1 4	20 80	5.38	1.41	NO
Total	60	61.5	1 2 3	25 25 10	41 41 16	57.12	4.08	

Table 8.2
Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 8 Science—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 - History/Nature	4	4	2.14	0.83	0	0	75	41	25	41	YES
8.2 - Inquiry	9	9.25	15	3.71	83	30	15	27	1	6	NO
8.3 - Unifying Themes	4	4.12	1.88	1.17	42	47	58	47	0	0	YES
8.4 - Subj Matter/Conc	34	34.75	30.75	2.33	32	44	40	46	28	43	YES
8.5 - Design/Applic	4	4.12	2.57	0.73	69	46	23	42	8	27	NO
8.6 - Personal/Social	5	5.25	5.38	1.41	95	21	5	21	0	0	NO
Total	60	61.5	57.12	4.08	45	48	36	45	19	38	

Table 8.3
Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 8 Science—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 - History/Nature	4	4	2.14	0.83	2	0.53	50	13	YES	4	1	0.98	0.06	YES
8.2 - Inquiry	9	9.25	15	3.71	3.88	0.78	42	9	WEAK	26	5	0.77	0.08	YES
8.3 - Unifying Themes	4	4.12	1.88	1.17	1.38	0.48	34	13	NO	3	2	0.93	0.10	YES
8.4 - Subj Matter/Conc	34	34.75	30.75	2.33	18.12	3.89	52	12	YES	54	5	0.73	0.06	YES
8.5 - Design/Applic	4	4.12	2.57	0.73	1.86	0.64	45	16	WEAK	4	1	0.98	0.06	YES
8.6 - Personal/Social	5	5.25	5.38	1.41	2.62	0.70	50	13	YES	9	3	0.83	0.12	YES
Total	60	61.5	57.12	4.08	4.98	6.27	45	14		17	19	0.87	0.13	

Table 8.4
Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers
West Virginia Grade 8 Science—November 2003
Number of Assessment Items–52

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
8.1 - History/Nature	NO	YES	YES	YES
8.2 - Inquiry	YES	NO	WEAK	YES
8.3 - Unifying Themes	NO	YES	NO	YES
8.4 - Subj Matter/Conc	YES	YES	YES	YES
8.5 - Design/Applic	NO	NO	WEAK	YES
8.6 - Personal/Social	NO	NO	YES	YES

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

Item Number	Comments by Reviewer
2	Better match to earlier grade level standard (G.L.S.)
5	The picture gives away the answer
17	The correct answer is 3, but it could also be 1 & 4
50	Earth System
51	Chemical reactions
	Repetitive of item 4 in section 2

Table 8.6
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 8 Science—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	2	1	2	1	1	1	2	2
6	1	1	2	1	1	2	1	1
7	1	1	2	1	1	1	1	2
8	2	1	1	1	2	1	1	2
9	1	1	2	1	1	1	1	1
10	2	2	2	2	2	2	2	2
11	1	1	2	1	1	2	2	2
12	1	1	2	1	1	1	1	2
13	1	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1	1
15	1	2	1	1	2	2	1	1
16	1	1	1	1	1	1	1	1
17	1	1	2	2	1	2	1	1
18	1	1	2	1	1	1	1	1
19	1	1	2	1	2	1	2	2
20	2	1	2	1	1	2	1	2
21	1	2	2	2	1	1	2	2

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

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

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

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	2	1	2	2	2	2	2	3
43	2	1	1	2	1	1	2	2
44	1	1	1	1	1	2	2	2
45	2	1	3	2	2	1	2	3
46	1	1	1	1	1	2	1	1
47	1	2	2	1	2	1	1	2
48	2	1	1	1	2	1	1	1
49	1	1	2	1	2	2	2	2
50	1	1	1	1	2	2	1	1
51	1	1	2	1	2	2	2	2
52	2	2	2	1	3	3	2	2
Intraclass Corr Grade 8 Science					0.820			

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

Item Number	Comments by Reviewer
3	Energy
4	Properties of matter
	This is a real stretch
	Earlier G.L.E
6	Pop. & ecosystem. Earlier G.L.E.
	Populations and ecosystems
	It's a stretch. They do not have to design an environment.
7	The student did not have to illustrate or use vector quantities
	? Forces
9	Gravity
12	Stretch
	Pop. & ecosystems
13	The student does not have to explain, only identify.

Table 8.7(continued)
Notes by Reviewer
West Virginia Grade 8 Science—November 2003

Item Number	Comments by Reviewer
13	Only 1 of 3 systems assessed
	?
14	Stretch
	Only 1 of 3 systems assessed
16	Question unclear
17	Better match is in earlier grades
	Only used -- did not construct
18	Reproduction and heredity
	Very weak match
19	Energy
20	Earth & solar system
	Earth's history
	Earth's solar system

Table 8.7(continued)
Notes by Reviewer
West Virginia Grade 8 Science—November 2003

Item Number	Comments by Reviewer
21	Structure/function living better for earlier grade obj.
	Weak match
	(Reviewer put ? In primary obj.)
22	Tough question
	No construction involved
23	No construction
	Very simple
24	A stretch
25	Acids/bases
	Chemical reactions
	chem reaction
26	Negative only
27	Very weak match. No mention of rotation of planets

Table 8.7(continued)
Notes by Reviewer
West Virginia Grade 8 Science—November 2003

Item Number	Comments by Reviewer
27	Earth and solar system
29	(Reviewer put ? In primary obj.)
30	Stretch
	Energy
31	Structure/function living systems
33	Didn't summarize, but water quality was determined
36	No specific object
38	(Reviewer put ? In primary obj.)
	Basic definition isn't as high a level
	It is a food web, but students don't have to trace anything
40	No chemistry objectives
42	The students only have to identify, not draw
43	Biology

Table 8.7(continued)
Notes by Reviewer
West Virginia Grade 8 Science—November 2003

Item Number	Comments by Reviewer
43	Earth history
46	This similar question appears on an earlier test 7th #10
	Energy
	Only negative effect

Table 8.8
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewer
Grade 8 Science—November 2003
West Virginia

Item	DOK	PObj	S1Obj	DOK	PObj	S1Obj	S2Obj	DOK	PObj	S1Obj	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	S1Ob	DOK	PObj	S1Obj	DOK	PObj
1	1	8.4.7		1	8.4.7			1	8.4.7		1	8.4.7	1	8.4.7		1	8.4.7		1	8.4.7		1	8.4.7
2	1	8.4.7		1	8.4			1	8.4.7		1	8.4	1	8.4.7		1	8.4.6		1	8.4.7		1	8.4.7
3	1	8.4		1	8.1.2			1	8.1.2		1	8.1.2	1	8.1.2		1	8.4.15		1	8.4.20		1	8.1.2
4	1	8.4		1	8.4.15			1	8.4		1	8.4	1			1	8.3.3		1	8.4.15		1	8.4
5	2	8.4.27		1	8.4	8.2.7		2	8.2.7		1	8.4.27	1	8.4.27	8.2.7	1	8.2.7		2	8.4.27		2	8.4.27
6	1	8.4.10		1	8.4			2	8.4.10		1	8.4	1	8.4.10		2	8.3.1		1	8.4.10		1	8.4.10
7	1	8.4.23		1	8.4.23			2	8.4		1	8.4.23	1	8.4.23		1	8.4.22		1	8.4.23		2	8.4.23
8	2	8.2.9		1	8.2.9			1	8.2.7	8.2.9	1	8.2.7	2	8.2.9	8.2.7	1	8.2.9		1	8.2.9		2	8.2.6
9	1	8.4.23		1	8.4			2	8.2.9		1	8.4.23	1	8.4.23		1	8.4.23		1	8.4.23		1	8.4
10	2	8.2.9		2	8.2.7	8.1.1	8.2.9	2	8.2.6		2	8.2.9	2	8.2.9		2	8.4.5		2	8.2.9		2	8.2.9
11	1	8.2.6		1	8.2.6			2	8.2.6		1	8.2.6	1	8.2.6		2	8.2.9		2	8.2.6		2	8.2.3
12	1	8.4.6		1	8.4.1			2	8.4.10		1	8.4.6	1	8.4.6		1	8.3.1	8.4.10	1	8.4		2	8.4
13	1	8.4.4		1	8.4.3			1	8.4.4		1	8.4.4	1	8.4.3		1	8.4.4		1	8.4.4		1	8.4
14	1	8.4.4		1	8.4.3			1	8.4.4		1	8.4.4	1	8.4.4		1	8.4.3		1	8.4.4		1	8.4
15	1	8.6.1		2	8.4.1			1	8.6.3		1	8.6.3	2	8.6.3		2	8.4.6		1	8.6.1		1	8.6.5
16	1	8.4.30		1	8.4.30			1	8.4.30		1	8.4.30	1	8.4.30	8.2.7	1	8.4.30		1	8.4.30		1	8.4
17	1	8.2.7		1	8.2.6			2	8.2.9	8.2.1	2	8.2.7	1	8.2.7		2	8.4.22		1	8.2		1	8.2
18	1	8.4		1	8.4.6			2	8.4.6		1	8.4.6	1	8.4.6		1	8.4.6		1	8.4.4		1	8.4.6
19	1	8.4.20		1	8.4.22			2	8.4.20		1	8.4	2	8.4.20	8.2.7	1	8.4.20		2	8.4.20		2	8.4
20	2	8.4		1	8.1.1			2	8.4.32		1	8.4	1			2	8.4.1	8.2.1	1	8.4		2	8.4
21	1	8.4		2	8.4.1			2		8.2.3	2	8.4.5	1	8.6.5		1	8.4.5		2	8.6.1	8.4.5	2	8.6
22	2	8.4.26		1	8.4.26			3	8.4.28	8.4.26	1	8.4.26	2	8.4.30		2	8.4.26		1	8.4.26		2	8.4.30
23	1	8.4.22		2	8.2.7			2	8.2.7		2	8.2.7	1	8.2.7		1	8.2.7		2	8.2.7		1	8.2.9
24	2	8.4.7		1	8.4.6			2	8.4.6		1	8.4.7	1			2	8.4.7		2	8.4.6		2	8.6
25	2	8.4	8.2.7	2	8.4	8.2.7		2	8.4		2	8.4.7	2	8.2.9	8.2.7	1	8.2.7		2	8.2.7	8.4	2	8.2
26	1	8.6.3		1	8.6.1			1	8.6.1		1	8.6.3	2	8.6.3		1	8.6.3		1	8.6.1		1	8.6.5
27	1	8.4		1	8.4.33			1	8.4		1	8.4.33	1	8.4.33		1	8.4.33		1	8.4.34		1	8.4

Table 8.8 (continued)
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewer
Grade 8 Science—November 2003
West Virginia

Item	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	S2Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj
28	2	8.5.4		2	8.5.4		2	8.4.4		2	8.5.4	8.4.21	2	8.3.4			2	8.5.4		1	8.5.4		2	8.5.4	
29	2	8.4.23		1	8.4.24		2			2	8.4.21		2	8.4.24	8.2.7		1	8.4.24		2	8.4.24		3	8.4.24	
30	2	8.5.4		2	8.4.20		2	8.4.15		2	8.4		2	8.3.4	8.4.20		2	8.4.17		2	8.3.4		2	8.4.20	
31	1	8.4		1	8.2.7	8.4.5	2	8.4.5		1	8.4.5		2	8.4.5	8.2.7		1	8.4.5		2	8.4.5		2	8.4.5	
32	1	8.6.5		1	8.6		1	8.6.5		1	8.6.5		1	8.6.3			1	8.6.5		2	8.5.3		2	8.6	
33	2	8.2.7		2	8.2.7		2	8.2.7		2	8.2.7		2	8.4.25	8.6.3	8.2.7	2	8.4.25		2	8.2.7		3	8.2.9	8.6.3
34	2	8.2.7	8.6.3	2	8.6		3	8.2.7		2	8.2.7	8.5.4	2	8.5.1			2	8.2.7	8.4.18	1	8.2.7	8.6.1	2	8.4	8.2.9
35	1	8.6.3		1	8.4.18		2	8.4.18		1	8.6.5		1	8.6.3			1	8.6.5		1	8.4.18		1	8.6	
36	2	8.4.31		1	8.4		1	8.4		2	8.5.4		2	8.3.1			1	8.4.31		2	8.4.31		2	8.5	
37	1	8.2.6		1	8.2.6		2	8.2.6		2	8.2.6		2	8.2.6			1	8.2.2		1	8.2.6		1	8.2.9	
38	1	8.3.1		1	8.3		2			1	8.3.1		1	8.4.10			1	8.3.1		2	8.3.1		1	8.4.10	
39	3	8.4.7		1	8.4.7	8.2.7	2	8.4.7		2	8.4.7		3	8.4.7	8.2.7		3	8.4.7		2	8.4.7		3	8.4.7	
40	1	8.2.6		1	8.2.6		2	8.2.6		1	8.2.6		2	8.2.6	8.2.7		1	8.2.6		1	8.2.6		2	8.2.6	
41	1	8.4.8		1	8.4.8		2	8.4.8		2	8.4.4		1	8.4.4			1	8.4.8		1	8.4.4		1	8.4.8	
42	2	8.4.32		1	8.4.32		2	8.4.32		2	8.4.32		2	8.4.32			2	8.4.32		2	8.4.32		3	8.4	
43	2	8.2.9		1	8.4		1	8.2.9		2	8.4		1	8.2.9			1	8.4.9		2	8.2.9		2	8.2.3	
44	1	8.2.6		1	8.2.6		1	8.2.6		1	8.2.3		1	8.2.6	8.4.6		2	8.2.2		2	8.1.1	8.2.6	2	8.2	
45	2	8.2.9		1	8.2.7	8.2.9	3	8.2.7	8.2.6	2	8.2.7		2	8.2.7			1	8.2.7		2	8.2.7		3	8.2.9	
46	1	8.6.3		1	8.4	8.6.3	1	8.6.4		1	8.6.3		1	8.4.18	8.6.5		2	8.6.3		1	8.4.18	8.6.5	1	8.6.5	
47	1	8.4.11		2	8.2.7	8.4.14	2	8.4.14		1	8.4.14		2	8.4.11	8.2.7		1	8.4.14		1	8.4.11		2	8.4.11	
48	2	8.1.4	8.2.6	1	8.1.4		1	8.1.4		1	8.1.4		2	8.1.4			1	8.4.11		1	8.1.4		1	8.1.4	
49	1	8.4.28		1	8.4		2	8.3.3		1	8.4.28		2	8.4.28			2	8.4.28		2	8.4.28	8.3.1	2	8.3.3	
50	1	8.4		1	8.5.1		1	8.2.9		1	8.5.4		2	8.5.1	8.5.4		2	8.5.1		1	8.5.1		1	8.2.9	
51	1	8.4		1	8.4.5		2	8.4.5		1	8.4.5		2	8.4.5	8.4.17		2	8.4.5		2	8.4.16		2	8.4.5	
52	2	8.4.14		2	8.4.12		2	8.4.13		1	8.4.14		3	8.4.13			3	8.4.13		2	8.4.13		2	8.4.13	

Table 8.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 8 Science—November 2003

Low		Medium		High
7		8.788462		13

1:	8.4.7	8.4.7	8.4.7	8.4.7	8.4.7	8.4.7	8.4.7	8.4.7		
2:	8.4	8.4	8.4.6	8.4.7	8.4.7	8.4.7	8.4.7	8.4.7		
3:	8.1.2	8.1.2	8.1.2	8.1.2	8.1.2	8.4	8.4.15	8.4.20		
4:	8.3.3	8.4	8.4	8.4	8.4	8.4.15	8.4.15			
5:	8.2.7	8.2.7	8.2.7	8.2.7	8.4	8.4.27	8.4.27	8.4.27	8.4.27	8.4.27
6:	8.3.1	8.4	8.4	8.4.10	8.4.10	8.4.10	8.4.10	8.4.10		
7:	8.4	8.4.22	8.4.23	8.4.23	8.4.23	8.4.23	8.4.23	8.4.23		
8:	8.2.6	8.2.7	8.2.7	8.2.7	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9
9:	8.2.9	8.4	8.4	8.4.23	8.4.23	8.4.23	8.4.23	8.4.23		
10:	8.1.1	8.2.6	8.2.7	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9	8.2.9	8.4.5
11:	8.2.3	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.2.9		
12:	8.3.1	8.4	8.4	8.4.1	8.4.6	8.4.6	8.4.6	8.4.10	8.4.10	
13:	8.4	8.4.3	8.4.3	8.4.4	8.4.4	8.4.4	8.4.4	8.4.4		
14:	8.4	8.4.3	8.4.3	8.4.4	8.4.4	8.4.4	8.4.4	8.4.4		
15:	8.4.1	8.4.6	8.6.1	8.6.1	8.6.3	8.6.3	8.6.3	8.6.5		
16:	8.2.7	8.4	8.4.30	8.4.30	8.4.30	8.4.30	8.4.30	8.4.30	8.4.30	
17:	8.2	8.2	8.2.1	8.2.6	8.2.7	8.2.7	8.2.7	8.2.9	8.4.22	
18:	8.4	8.4.4	8.4.6	8.4.6	8.4.6	8.4.6	8.4.6	8.4.6		
19:	8.2.7	8.4	8.4	8.4.20	8.4.20	8.4.20	8.4.20	8.4.20	8.4.22	
20:	8.1.1	8.2.1	8.4	8.4	8.4	8.4	8.4.1	8.4.32		
21:	8.2.3	8.4	8.4.1	8.4.5	8.4.5	8.4.5	8.6	8.6.1	8.6.5	
22:	8.4.26	8.4.26	8.4.26	8.4.26	8.4.26	8.4.26	8.4.28	8.4.30	8.4.30	

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

23:	8.2.7	8.2.7	8.2.7	8.2.7	8.2.7	8.2.7	8.2.9	8.4.22					
24:	8.4.6	8.4.6	8.4.6	8.4.7	8.4.7	8.4.7	8.6						
25:	8.2	8.2.7	8.2.7	8.2.7	8.2.7	8.2.7	8.2.9	8.4	8.4	8.4	8.4	8.4.7	
26:	8.6.1	8.6.1	8.6.1	8.6.3	8.6.3	8.6.3	8.6.3	8.6.5					
27:	8.4	8.4	8.4	8.4.33	8.4.33	8.4.33	8.4.33	8.4.34					
28:	8.3.4	8.4.4	8.4.21	8.5.4	8.5.4	8.5.4	8.5.4	8.5.4	8.5.4				
29:	8.2.7	8.4.21	8.4.23	8.4.24	8.4.24	8.4.24	8.4.24	8.4.24					
30:	8.3.4	8.3.4	8.4	8.4.15	8.4.17	8.4.20	8.4.20	8.4.20	8.5.4				
31:	8.2.7	8.2.7	8.4	8.4.5	8.4.5	8.4.5	8.4.5	8.4.5	8.4.5	8.4.5			
32:	8.5.3	8.6	8.6	8.6.3	8.6.5	8.6.5	8.6.5	8.6.5					
33:	8.2.7	8.2.7	8.2.7	8.2.7	8.2.7	8.2.7	8.2.9	8.4.25	8.4.25	8.6.3	8.6.3		
34:	8.2.7	8.2.7	8.2.7	8.2.7	8.2.7	8.2.9	8.4	8.4.18	8.5.1	8.5.4	8.6	8.6.1	8.6.3
35:	8.4.18	8.4.18	8.4.18	8.6	8.6.3	8.6.3	8.6.5	8.6.5					
36:	8.3.1	8.4	8.4	8.4.31	8.4.31	8.4.31	8.5	8.5.4					
37:	8.2.2	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.2.9					
38:	8.3	8.3.1	8.3.1	8.3.1	8.3.1	8.4.10	8.4.10						
39:	8.2.7	8.2.7	8.4.7	8.4.7	8.4.7	8.4.7	8.4.7	8.4.7	8.4.7	8.4.7			
40:	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.2.7				
41:	8.4.4	8.4.4	8.4.4	8.4.8	8.4.8	8.4.8	8.4.8	8.4.8					
42:	8.4	8.4.32	8.4.32	8.4.32	8.4.32	8.4.32	8.4.32	8.4.32					
43:	8.2.3	8.2.9	8.2.9	8.2.9	8.2.9	8.4	8.4	8.4.9					
44:	8.1.1	8.2	8.2.2	8.2.3	8.2.6	8.2.6	8.2.6	8.2.6	8.2.6	8.4.6			
45:	8.2.6	8.2.7	8.2.7	8.2.7	8.2.7	8.2.7	8.2.7	8.2.9	8.2.9	8.2.9			
46:	8.4	8.4.18	8.4.18	8.6.3	8.6.3	8.6.3	8.6.3	8.6.4	8.6.5	8.6.5	8.6.5		

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

47:	8.2.7	8.2.7	8.4.11	8.4.11	8.4.11	8.4.11	8.4.14	8.4.14	8.4.14	8.4.14
48:	8.1.4	8.1.4	8.1.4	8.1.4	8.1.4	8.1.4	8.1.4	8.2.6	8.4.11	
49:	8.3.1	8.3.3	8.3.3	8.4	8.4.28	8.4.28	8.4.28	8.4.28	8.4.28	
50:	8.2.9	8.2.9	8.4	8.5.1	8.5.1	8.5.1	8.5.1	8.5.4	8.5.4	
51:	8.4	8.4.5	8.4.5	8.4.5	8.4.5	8.4.5	8.4.5	8.4.16	8.4.17	
52:	8.4.12	8.4.13	8.4.13	8.4.13	8.4.13	8.4.13	8.4.14	8.4.14		

Table 8.10
Items Coded by Reviewers to Each Objective
West Virginia Grade 8 Science—November 2003

Low		Medium		High
0		6.820896		49

root:
8.1:
8.1.1:	10	20	44
8.1.2:	3	3	3	3	3
8.1.3:
8.1.4:	48	48	48	48	48	48	48
8.2:	17	17	25	44
8.2.1:	17	20
8.2.2:	37	44
8.2.3:	11	21	43	44
8.2.4:
8.2.5:
8.2.6:	8	10	11	11	11	11	11	11	17	37	37	37	37	37	37	40	40	40	40	40	40	40	40	44	44	44	44	44	45	48
8.2.7:	5	5	5	5	8	8	8	10	16	17	17	17	19	23	23	23	23	23	23	25	25	25	25	25	29	31	31	33	33	33	33	33	33	34	34	34	34	34	39	39	40	45	45	45	45	45	45	47	47
8.2.8:
8.2.9:	8	8	8	8	8	8	9	10	10	10	10	10	10	11	17	23	25	33	34	37	43	43	43	43	45	45	45	50	50
8.3:	38
8.3.1:	6	12	36	38	38	38	38	49
8.3.2:
8.3.3:	4	49	49

Table 8.10 (continued)

Items Coded by Reviewers to Each Objective

West Virginia Grade 8 Science—November 2003

8.3.4:	28	30	30																																										
8.4:	2	2	3	4	4	4	4	5	6	6	7	9	9	12	12	13	14	16	18	19	19	20	20	20	20	21	25	25	25	25	27	27	27	30	31	34	36	36	42	43	43	46	49	50	51
8.4.1:	12	15	20	21																																									
8.4.2:																																													
8.4.3:	13	13	14	14																																									
8.4.4:	13	13	13	13	13	14	14	14	14	14	18	28	41	41	41																														
8.4.5:	10	21	21	21	31	31	31	31	31	31	31	51	51	51	51	51	51																												
8.4.6:	2	12	12	12	15	18	18	18	18	18	18	24	24	24	44																														
8.4.7:	1	1	1	1	1	1	1	1	2	2	2	2	2	24	24	24	25	39	39	39	39	39	39	39	39																				
8.4.8:	41	41	41	41	41																																								
8.4.9:	43																																												
8.4.10:	6	6	6	6	6	12	12	38	38																																				
8.4.11:	47	47	47	47	48																																								
8.4.12:	52																																												
8.4.13:	52	52	52	52	52																																								
8.4.14:	47	47	47	47	52	52																																							
8.4.15:	3	4	4	30																																									
8.4.16:	51																																												
8.4.17:	30	51																																											
8.4.18:	34	35	35	35	46	46																																							
8.4.19:																																													
8.4.20:	3	19	19	19	19	19	30	30	30																																				
8.4.21:	28	29																																											
8.4.22:	7	17	19	23																																									

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

8.4.23:	7	7	7	7	7	7	9	9	9	9	9	29					
8.4.24:	29	29	29	29	29												
8.4.25:	33	33															
8.4.26:	22	22	22	22	22	22											
8.4.27:	5	5	5	5	5												
8.4.28:	22	49	49	49	49	49											
8.4.29:																	
8.4.30:	16	16	16	16	16	16	16	22	22								
8.4.31:	36	36	36														
8.4.32:	20	42	42	42	42	42	42	42									
8.4.33:	27	27	27	27													
8.4.34:	27																
8.5:	36																
8.5.1:	34	50	50	50	50												
8.5.2:																	
8.5.3:	32																
8.5.4:	28	28	28	28	28	28	30	34	36	50	50						
8.6:	21	24	32	32	34	35											
8.6.1:	15	15	21	26	26	26	34										
8.6.2:																	
8.6.3:	15	15	15	26	26	26	26	32	33	33	34	35	35	46	46	46	46
8.6.4:	46																
8.6.5:	15	21	26	32	32	32	32	35	35	46	46	46					

Table 8.11

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

West Virginia Grade 8 Science—November 2003

One Reviewer		50 % of Reviewers		All Reviewers
1		4		8

root:																	
8.1:																	
8.1.1:	10:1	20:1	44:1														
8.1.2:	3:5																
8.1.3:																	
8.1.4:	48:7																
8.2:	17:2	25:1	44:1														
8.2.1:	17:1	20:1															
8.2.2:	37:1	44:1															
8.2.3:	11:1	21:1	43:1	44:1													
8.2.4:																	
8.2.5:																	
8.2.6:	8:1	10:1	11:6	17:1	37:6	40:8	44:5	45:1	48:1								
8.2.7:	5:4	8:3	10:1	16:1	17:3	19:1	23:6	25:5	29:1	31:2	33:6	34:5	39:2	40:1	45:6	47:2	
8.2.8:																	
8.2.9:	8:6	9:1	10:6	11:1	17:1	23:1	25:1	33:1	34:1	37:1	43:4	45:3	50:2				
8.3:	38:1																
8.3.1:	6:1	12:1	36:1	38:4	49:1												
8.3.2:																	
8.3.3:	4:1	49:2															
8.3.4:	28:1	30:2															

Table 8.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 8 Science—November 2003

8.4:	2:2	3:1	4:4	5:1	6:2	7:1	9:2	12:2	13:1	14:1	16:1	18:1	19:2	20:4	21:1	25:4	27:3	30:1	31:1	34:1	36:2	42:1	43:2	46:1	49:1	50:1	51:1
8.4.1:	12:1	15:1	20:1	21:1																							
8.4.2:																											
8.4.3:	13:2	14:2																									
8.4.4:	13:5	14:5	18:1	28:1	41:3																						
8.4.5:	10:1	21:3	31:7	51:6																							
8.4.6:	2:1	12:3	15:1	18:6	24:3	44:1																					
8.4.7:	1:8	2:5	24:3	25:1	39:8																						
8.4.8:	41:5																										
8.4.9:	43:1																										
8.4.10:	6:5	12:2	38:2																								
8.4.11:	47:4	48:1																									
8.4.12:	52:1																										
8.4.13:	52:5																										
8.4.14:	47:4	52:2																									
8.4.15:	3:1	4:2	30:1																								
8.4.16:	51:1																										
8.4.17:	30:1	51:1																									
8.4.18:	34:1	35:3	46:2																								
8.4.19:																											
8.4.20:	3:1	19:5	30:3																								
8.4.21:	28:1	29:1																									
8.4.22:	7:1	17:1	19:1	23:1																							
8.4.23:	7:6	9:5	29:1																								

Table 8.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 8 Science—November 2003

8.4.24:	29:5						
8.4.25:	33:2						
8.4.26:	22:6						
8.4.27:	5:5						
8.4.28:	22:1	49:5					
8.4.29:							
8.4.30:	16:7	22:2					
8.4.31:	36:3						
8.4.32:	20:1	42:7					
8.4.33:	27:4						
8.4.34:	27:1						
8.5:	36:1						
8.5.1:	34:1	50:4					
8.5.2:							
8.5.3:	32:1						
8.5.4:	28:6	30:1	34:1	36:1	50:2		
8.6:	21:1	24:1	32:2	34:1	35:1		
8.6.1:	15:2	21:1	26:3	34:1			
8.6.2:							
8.6.3:	15:3	26:4	32:1	33:2	34:1	35:2	46:4
8.6.4:	46:1						
8.6.5:	15:1	21:1	26:1	32:4	35:2	46:3	

Table 10.1
Categorical Concurrence Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 10 Science—November 2003
Number of Assessment Items–50

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 - History/Nature	5	5.12	1 2	3 2	60 40	1.62	0.70	NO
10.2 - Inquiry	8	8.62	1 2 3	2 5 1	25 62 12	8.12	1.83	YES
10.3 - Unifying Themes	4	4	2	4	100	4.88	3.52	NO
10.4 - Subj Matter/Conc	40	40.75	1 2 3	15 24 1	37 60 2	33.38	2.18	YES
10.5 - Design/Applic	4	4.5	1 2 3	1 1 2	25 25 50	1.75	0.66	NO
10.6 - Personal/Social	5	5.5	1 2 3	1 1 3	20 20 60	4.62	1.22	NO
Total	66	68.5	1 2 3	22 37 7	33 56 10	54.38	3.31	

Table 10.2
Depth-of-Knowledge Consistency Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 10 Science—November 2003
Number of Assessment Items–50

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.	
10.1 - History/Nature	5	5.12	1.62	0.70	36	48	59	47	5	14	YES
10.2 - Inquiry	8	8.62	8.12	1.83	51	42	46	42	3	17	WEAK
10.3 - Unifying Themes	4	4	4.88	3.52	15	31	63	42	22	38	YES
10.4 - Subj Matter/Conc	40	40.75	33.38	2.18	29	42	46	45	25	39	YES
10.5 - Design/Applic	4	4.5	1.75	0.66	95	14	5	14	0	0	NO
10.6 - Personal/Social	5	5.5	4.62	1.22	81	39	14	35	5	21	NO
Total	66	68.5	54.38	3.31	38	45	44	45	18	35	

Table 10.3
Range-of-Knowledge Correspondence and Balance of Representation Between Standards and Assessment as Rated by Eight Reviewers
West Virginia Grade 10 Science—November 2003
Number of Assessment Items–50

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 - History/Nature	5	5.12	1.62	0.70	1.38	0.48	27	10	NO	3	1	0.98	0.06	YES
10.2 - Inquiry	8	8.62	8.12	1.83	4.25	0.97	49	12	WEAK	15	3	0.80	0.06	YES
10.3 - Unifying Themes	4	4	4.88	3.52	2.5	1	62	25	YES	9	6	0.83	0.13	YES
10.4 - Subj Matter/Conc	40	40.75	33.38	2.18	20.38	2.64	50	7	YES	62	6	0.76	0.04	YES
10.5 - Design/Applic	4	4.5	1.75	0.66	1.38	0.48	31	10	NO	3	1	0.98	0.06	YES
10.6 - Personal/Social	5	5.5	4.62	1.22	2.62	1.22	47	19	WEAK	9	2	0.83	0.12	YES
Total	66	68.5	54.38	3.31	5.42	6.89	44	19		17	21	0.86	0.12	

Table 10.4
Summary of Attainment of Acceptable Alignment Level on Four Content Focus Criteria
Eight Reviewers
West Virginia Grade 10 Science—November 2003
Number of Assessment Items–50

Standards	Alignment Criteria			
	Categorical Concurrence	Depth-of-Knowledge Consistency	Range of Knowledge	Balance of Representation
10.1 - History/Nature	NO	YES	NO	YES
10.2 - Inquiry	YES	WEAK	WEAK	YES
10.3 - Unifying Themes	NO	YES	YES	YES
10.4 - Subj Matter/Conc	YES	YES	YES	YES
10.5 - Design/Applic	NO	NO	NO	YES
10.6 - Personal/Social	NO	NO	WEAK	YES

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

Item Number	Comments by Reviewer
11	Arguments could be made for more than one answer
	Human pop growth can cause these effects but doesn't have to cause these effects. Very value laden!
12	I cannot tell from the diagram if it is one or four
21	Diagram unnecessary to form question, and could confuse
30	Answer is not correct- people did not "make an effort"- engineers designed more efficient cars
47	Take "neatly" out of response b

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

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

Table 10.6 (continued)
Depth-of-Knowledge Levels by Item and Reviewers
Intraclass Correlation
West Virginia Grade 10 Science—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	1	1	1	1	1	2	1	2
24	1	1	2	1	2	1	1	2
25	1	2	2	1	1	1	2	1
26	1	1	2	1	1	1	1	1
27	2	1	1	1	1	1	1	1
28	2	2	1	2	2	2	2	3
29	2	2	2	1	2	1	2	2
30	1	1	1	1	1	1	1	1
31	2	2	1	2	2	1	1	1
32	1	1	2	1	1	3	1	2
33	2	2	2	2	2	2	1	2
34	1	2	2	1	1	2	1	2
35	1	1	2	2	1	1	1	2
36	3	2	3	2	2	3	3	2
37	1	1	1	1	1	2	1	1
38	2	3	3	2	3	3	2	3
39	2	2	3	2	3	3	3	3
40	3	2	3	2	3	3	3	3
41	3	2	2	2	2	3	2	2

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

Item	Rater One	Rater Two	Rater Three	Rater Four	Rater Five	Rater Six	Rater Seven	Rater Eight
42	1	2	2	1	2	2	1	2
43	2	1	1	1	1	2	1	2
44	1	1	2	2	1	2	1	2
45	1	1	2	2	1	2	1	2
46	2	1	2	2	2	2	1	2
47	2	1	2	2	1	1	1	1
48	2	2	2	1	2	1	2	3
49	1	1	2	1	2	2	1	2
50	2	1	2	2	2	1	1	2
Intraclass Corr Grade 10 Science					0.865			

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

Item Number	Comments by Reviewer
2	After secondary obj. Reviewer put: slight. Forces and Motion = earlier standard
	Better match to earlier grade level standard (E.G.L.S) Inquiry
	Only making a conclusion
3	Inquiry. E.G.L.S.
5	Very simplistic and life e,g,l,s
	After primary obj. Reviewer put: slight. diff only phy and chem changes not nuclear
	Only physical and chemical changes
	Too much reading
6	Only PH
	After primary obj. Reviewer put: Slight. not solutions or other properties
8	Only chloroplasts
10	Better match to earlier standards
	E.G.L.S.

Table 10.7(continued)
Notes by Reviewer
West Virginia Grade 10 Science—November 2003

Item Number	Comments by Reviewer
12	Only constructed the model
13	Life science
	Stretch
	Really a stretch-only immune system
14	After primary obj. Reviewer put ?
	Energy in earth systems
	#14-17: no clear match to objectives. Occasionally a stretch to standard.
	Earth science
15	Physical change only
	E.G.L.S.
	After primary obj. Reviewer put: stretch
16	Energy
	Energy

Table 10.7(continued)
Notes by Reviewer
West Virginia Grade 10 Science—November 2003

Item Number	Comments by Reviewer
16	Physical only
	Properties of matter
	?
17	?
	Properties of matter
	Energy
	Energy
18	Better match to earlier "tide" objectives
	Journals
19	?
	Really a stretch-but could have gone here
20	Prop. of matter. E.G.L.S.
	Energy

Table 10.7(continued)
Notes by Reviewer
West Virginia Grade 10 Science—November 2003

Item Number	Comments by Reviewer
21	Didn't address all 3
	?
	Motions and forces
22	Animal adaptations
	Weak match
	Structure/function living earlier grade
23	Earth systems and universe
24	Personal/social
	E.G.L.E.
25	Slight
26	Adapt Of liv. Things. E.G.L.E.
28	Weak match
29	Stretch

Table 10.7(continued)
Notes by Reviewer
West Virginia Grade 10 Science—November 2003

Item Number	Comments by Reviewer
32	?
33	?
35	Captures part of objective only
36	After secondary obj. Reviewer put: stretch
37	Are not constructing a model
41	Matter, energy & organization in living systems
42	Longest answer
43	Only deal with elec, circuits
	Energy E.G.L.S.
	Stretch. does not show relationship between elect.and mag.
44	Stretch
45	Weak match

Table 10.8
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewer
Grade 10 Science—November 2003
West Virginia

Item	DOK	PObj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj		DOK	PObj	S1Obj	S2Obj	DOK	PObj	S1Ob	DOK	PObj	S1Obj	DOK	PObj	S1Obj
1	1	10.2.8	1	10.2.8		3	10.2.8		1	10.2.8		2	10.2.7	10.2.8	10.3.3	1	10.2.8		1	10.2.8		2	10.4.25	10.2.7
2	1	10.2	1	10.4	10.2	2	10.2.7		1	10.2		1	10.4.26			1	10.3.3		1	10.2		2	10.4.25	
3	2	10.2	1	10.2.7		2	10.2.7		1	10.2		1	10.2.8			1	10.2.7		2	10.2		2	10.2.7	
4	1	10.4.18	2	10.2.8		2	10.2.2	10.2.8	1	10.2.8		1	10.2.8			1	10.2.8		2	10.2.2		2	10.2.2	
5	1	10.2	1	10.4.18		1	10.4.18		1	10.4.18		1	10.4.18			1	10.4.18		1	10.4.18		1	10.4	
6	1	10.2.7	1	10.4.17		2	10.4.17		1	10.4.17		1	10.4.17			2	10.4.14		1	10.2.4		1	10.2.3	
7	1	10.4.38	1	10.4.38		2	10.4.38		1	10.4.38		1	10.4.38			1	10.4.10		1	10.4.38		1	10.4.38	
8	1	10.4.2	1	10.4.2		1	10.4.2		1	10.4.2		1	10.4.2			2	10.4.2		1	10.4.2		1	10.4	
9	1	10.4.2	1	10.4.2		1	10.4.3		1	10.4.2		1	10.4.2			1	10.4.4		1	10.4.3		2	10.4.2	
10	1	10.6.2	1	10.4		2	10.6.2		1	10.6.2		1	10.6.2			1	10.4.24		1	10.6		2	10.6.3	
11	2	10.6.2	2	10.6		2	10.6.1		1	10.6.1		1	10.6.2			1	10.3.1		2	10.6.3		2	10.2.3	
12	2	10.5.3	2	10.2.8		2	10.2.3		2	10.5.3		2	10.3.2	10.5.3		1	10.2.8	10.5.3	2	10.5.3		2	10.5	
13	1	10.4	1	10.4.3		1	10.4.13		1	10.4.13		1	10.4.3			1	10.4.13		1	10.4.13		2	10.3.1	
14	1	10.4	2	10.4.20		2	10.4.19	10.4.20	1	10.4		1				2	10.4.20		1	10.4		2	10.4	
15	2	10.1	1	10.4.1		2	10.5	10.2.1	2	10.5		2	10.4.20			1	10.1.2		2	10.6		2	10.6	
16	1	10.4	2	10.4		1			1	10.4		2	10.4.20			2	10.4.17		2	10.5		1	10.2	
17	2	10.4	1	10.4		2			1	10.4		1				2	10.4.17		3	10.5		2	10.2	
18	1	10.4.30	1	10.4		2	10.4.39	10.4.30	1	10.4.30		1	10.4.30			1	10.4.30		1	10.4.30		1	10.4.30	
19	1	10.1	1	10.2.2		1			1	10.2.2		1	10.2.2			1	10.1.5		1	10.1.5		1	10.2	
20	1	10.4	2	10.4.24		2	10.2.6		1	10.4		2	10.4.24	10.3.3		2	10.4.18		2	10.4	10.3.2	2	10.4.24	
21	1	10.4	2	10.4		1			1	10.4.25		1	10.4.19			1	10.4.25		1	10.4.25		2	10.4	
22	1	10.4	1	10.4		1	10.4		1	10.4.11		1	10.4.11			1	10.4.11		1	10.4		1	10.4	
23	1	10.4	1	10.1.1		1	10.4.39		1	10.4.30		1				2	10.4.39		1	10.4		2	10.4.39	
24	1	10.4	1	10.6.2		2	10.6.2		1	10.6		2	10.4.18			1	10.6.2		1	10.4.18		2	10.6	
25	1	10.4.21	2	10.4.21		2	10.4.27		1	10.4.21		1	10.4.21			1	10.4.21		2	10.4.21		1	10.4.21	
26	1	10.4.14	1	10.4		2	10.4.11		1	10.4		1	10.4.14			1	10.4.11		1	10.4.11		1	10.4.14	
27	2	10.2.4	1	10.2.4		1	10.4.29		1	10.4.2		1	10.2.4			1	10.2.4		1	10.2.4		1	10.2.4	

Table 10.8 (continued)
Depth-of-Knowledge Level and Objectives Coded by Each of Eight Reviewer
Grade 10 Science—November 2003
West Virginia

Item	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj	DOK	PObj	S1Obj
28	2	10.4.23		2	10.4.23		1	10.4.33		2	10.4.23		2	10.4.23	10.3.3	2	10.4.23		2	10.4.23		3	10.4.23	10.3.1
29	2	10.4.5		2	10.1.5		2	10.1.5		1	10.1.5		2	10.1.5		1	10.1.5		2	10.4.5	10.4.7	2	10.1.5	
30	1	10.6.2		1	10.5.2		1	10.6.2		1	10.6.5		1	10.6.2		1	10.6.2		1	10.6.3		1	10.6.5	
31	2	10.4.36		2	10.2.7		1	10.4.12		2	10.4.36		2	10.4.36		1	10.4.38		1	10.4.36		1	10.4.36	
32	1	10.4		1	10.4.6		2			1	10.6.2		1	10.5.2		3	10.4.6		1	10.4.6		2	10.2.3	10.4
33	2	10.5.3		2	10.3.1		2			2	10.3.4		2	10.3.4	10.4.20	2	10.5.3	10.3.1	1	10.3.4		2	10.4	
34	1	10.6.2		2	10.4.1	10.4.31	2	10.6.2		1	10.6.2		1	10.6.2	10.4.20	2	10.6.2		1	10.6.2		2	10.6.2	10.1.1
35	1	10.4.34		1	10.3.3		2	10.4.34		2	10.4.34		1	10.4.34		1	10.4.34		1	10.4.34		2	10.3.3	
36	3	10.4.31		2	10.4.1	10.4.31	3	10.4.11	10.4.12	2	10.4.12		2	10.6.1		3	10.4.36	10.6.1	3	10.4.31	10.3.1	2	10.6.1	10.4
37	1	10.4.5		1	10.4.6		1	10.4.5		1	10.4.5		1	10.4.5		2	10.4.5		1	10.4.5		1	10.4.5	
38	2	10.4.7		3	10.4.7		3	10.4.7		2	10.4.7		3	10.4.7		3	10.4.7		2	10.4.7		3	10.4.7	10.3.3
39	2	10.4.21		2	10.4.21		3	10.4.21	10.4.22	2	10.4.21		3	10.4.21	10.3.3	3	10.4.21		3	10.4.21		3	10.4.21	10.3.3
40	3	10.4.19	10.3.3	2	10.4.19	10.3.3	3	10.4.19		2	10.4.19	10.3.3	3	10.4.19		3	10.4.19		3	10.4.19	10.3.3	3	10.4.19	10.3.3
41	3	10.4.12		2	10.4.12		2	10.4.12		2	10.4		2	10.4.12		3	10.4.12		2	10.4.14		2	10.4.14	
42	1	10.4.39		2	10.4.39		2	10.4.39		1	10.4.39		2	10.4.39		2	10.4.39		1	10.4.39		2	10.4.39	
43	2	10.4.23		1	10.4.23		1	10.4.28		1	10.4		1	10.4.23	10.2.7	2	10.4.23		1	10.4.23		2	10.3.2	
44	1	10.4.20		1	10.4.19	10.4.20	2	10.3.3		2	10.4.20		1	10.4.20	10.3.3	2	10.3.1	10.4.17	1	10.4.20		2	10.4.20	
45	1	10.4.2		1	10.4.2		2	10.4.2		2	10.4.2		1	10.4.2		2	10.4.2		1	10.4.2		2	10.4.2	
46	2	10.4.30		1	10.4.30		2	10.4		2	10.4.30		2	10.4.30	10.3.3	2	10.4.1		1	10.4.30		2	10.4.30	
47	2	10.2.7		1	10.2.8		2	10.2.7	10.2.3	2	10.2.8		1	10.2.7		1	10.2.8		1	10.2.2		1	10.2.2	
48	2	10.4.31		2	10.4.31		2	10.3.3		1	10.4.31		2	10.4.31	10.3.3	1	10.4.31		2	10.3.2		3	10.3.1	10.4.31
49	1	10.4.25		1	10.4.25		2	10.4.25		1	10.4.25		2	10.3.1		2	10.4.25		1	10.4.25		2	10.4	
50	2	10.4.23		1	10.2		2	10.3.1		2	10.4.23		2	10.3.1	10.3.3	1	10.4.23		1	10.4.23		2	10.3.1	

Table 10.9
Objectives Coded to Each Item by Reviewers
West Virginia Grade 10 Science—November 2003

Low		Medium		High
6		8.7		13

1:	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	10.3.3	10.4.25
2:	10.2	10.2	10.2	10.2	10.2.7	10.3.3	10.4	10.4.25	10.4.26		
3:	10.2	10.2	10.2	10.2.7	10.2.7	10.2.7	10.2.7	10.2.8			
4:	10.2.2	10.2.2	10.2.2	10.2.8	10.2.8	10.2.8	10.2.8	10.2.8	10.4.18		
5:	10.2	10.4	10.4.18	10.4.18	10.4.18	10.4.18	10.4.18	10.4.18			
6:	10.2.3	10.2.4	10.2.7	10.4.14	10.4.17	10.4.17	10.4.17	10.4.17			
7:	10.4.10	10.4.38	10.4.38	10.4.38	10.4.38	10.4.38	10.4.38	10.4.38			
8:	10.4	10.4.2	10.4.2	10.4.2	10.4.2	10.4.2	10.4.2	10.4.2			
9:	10.4.2	10.4.2	10.4.2	10.4.2	10.4.2	10.4.3	10.4.3	10.4.4			
10:	10.4	10.4.24	10.6	10.6.2	10.6.2	10.6.2	10.6.2	10.6.3			
11:	10.2.3	10.3.1	10.6	10.6.1	10.6.1	10.6.2	10.6.2	10.6.3			
12:	10.2.3	10.2.8	10.2.8	10.3.2	10.5	10.5.3	10.5.3	10.5.3	10.5.3	10.5.3	
13:	10.3.1	10.4	10.4.3	10.4.3	10.4.13	10.4.13	10.4.13	10.4.13			
14:	10.4	10.4	10.4	10.4	10.4.19	10.4.20	10.4.20	10.4.20			
15:	10.1	10.1.2	10.2.1	10.4.1	10.4.20	10.5	10.5	10.6	10.6		
16:	10.2	10.4	10.4	10.4	10.4.17	10.4.20	10.5				
17:	10.2	10.4	10.4	10.4	10.4.17	10.5					
18:	10.4	10.4.30	10.4.30	10.4.30	10.4.30	10.4.30	10.4.30	10.4.30	10.4.39		
19:	10.1	10.1.5	10.1.5	10.2	10.2.2	10.2.2	10.2.2				
20:	10.2.6	10.3.2	10.3.3	10.4	10.4	10.4	10.4.18	10.4.24	10.4.24	10.4.24	
21:	10.4	10.4	10.4	10.4.19	10.4.25	10.4.25	10.4.25				
22:	10.4	10.4	10.4	10.4	10.4	10.4.11	10.4.11	10.4.11			

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

23:	10.1.1	10.4	10.4	10.4.30	10.4.39	10.4.39	10.4.39						
24:	10.4	10.4.18	10.4.18	10.6	10.6	10.6.2	10.6.2	10.6.2					
25:	10.4.21	10.4.21	10.4.21	10.4.21	10.4.21	10.4.21	10.4.21	10.4.27					
26:	10.4	10.4	10.4.11	10.4.11	10.4.11	10.4.14	10.4.14	10.4.14					
27:	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.2.4	10.4.2	10.4.29					
28:	10.3.1	10.3.3	10.4.23	10.4.23	10.4.23	10.4.23	10.4.23	10.4.23	10.4.23	10.4.33			
29:	10.1.5	10.1.5	10.1.5	10.1.5	10.1.5	10.1.5	10.4.5	10.4.5	10.4.7				
30:	10.5.2	10.6.2	10.6.2	10.6.2	10.6.2	10.6.3	10.6.5	10.6.5					
31:	10.2.7	10.4.12	10.4.36	10.4.36	10.4.36	10.4.36	10.4.36	10.4.38					
32:	10.2.3	10.4	10.4	10.4.6	10.4.6	10.4.6	10.5.2	10.6.2					
33:	10.3.1	10.3.1	10.3.4	10.3.4	10.3.4	10.4	10.4.20	10.5.3	10.5.3				
34:	10.1.1	10.4.1	10.4.20	10.4.31	10.6.2	10.6.2	10.6.2	10.6.2	10.6.2	10.6.2	10.6.2		
35:	10.3.3	10.3.3	10.4.34	10.4.34	10.4.34	10.4.34	10.4.34	10.4.34					
36:	10.3.1	10.4	10.4.1	10.4.11	10.4.12	10.4.12	10.4.31	10.4.31	10.4.31	10.4.36	10.6.1	10.6.1	10.6.1
37:	10.4.5	10.4.5	10.4.5	10.4.5	10.4.5	10.4.5	10.4.5	10.4.6					
38:	10.3.3	10.4.7	10.4.7	10.4.7	10.4.7	10.4.7	10.4.7	10.4.7	10.4.7				
39:	10.3.3	10.3.3	10.4.21	10.4.21	10.4.21	10.4.21	10.4.21	10.4.21	10.4.21	10.4.21	10.4.22		
40:	10.3.3	10.3.3	10.3.3	10.3.3	10.3.3	10.4.19	10.4.19	10.4.19	10.4.19	10.4.19	10.4.19	10.4.19	10.4.19
41:	10.4	10.4.12	10.4.12	10.4.12	10.4.12	10.4.12	10.4.14	10.4.14					
42:	10.4.39	10.4.39	10.4.39	10.4.39	10.4.39	10.4.39	10.4.39	10.4.39					
43:	10.2.7	10.3.2	10.4	10.4.23	10.4.23	10.4.23	10.4.23	10.4.23	10.4.28				
44:	10.3.1	10.3.3	10.3.3	10.4.17	10.4.19	10.4.20	10.4.20	10.4.20	10.4.20	10.4.20	10.4.20		
45:	10.4.2	10.4.2	10.4.2	10.4.2	10.4.2	10.4.2	10.4.2	10.4.2					
46:	10.3.3	10.4	10.4.1	10.4.30	10.4.30	10.4.30	10.4.30	10.4.30	10.4.30				

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

47:	10.2.2	10.2.2	10.2.3	10.2.7	10.2.7	10.2.7	10.2.8	10.2.8	10.2.8	
48:	10.3.1	10.3.2	10.3.3	10.3.3	10.4.31	10.4.31	10.4.31	10.4.31	10.4.31	10.4.31
49:	10.3.1	10.4	10.4.25	10.4.25	10.4.25	10.4.25	10.4.25	10.4.25		
50:	10.2	10.3.1	10.3.1	10.3.1	10.3.3	10.4.23	10.4.23	10.4.23	10.4.23	

Table 10.10
Items Coded by Reviewers to Each Objective
West Virginia Grade 10 Science—November 2003

Low		Medium		High
0		5.958904		40

root:																					
10.1:	15	19																			
10.1.1:	23	34																			
10.1.2:	15																				
10.1.3:																					
10.1.4:																					
10.1.5:	19	19	29	29	29	29	29	29													
10.2:	2	2	2	2	3	3	3	5	16	17	19	50									
10.2.1:	15																				
10.2.2:	4	4	4	19	19	19	47	47													
10.2.3:	6	11	12	32	47																
10.2.4:	6	27	27	27	27	27	27														
10.2.5:																					
10.2.6:	20																				
10.2.7:	1	1	2	3	3	3	3	6	31	43	47	47	47	47							
10.2.8:	1	1	1	1	1	1	1	3	4	4	4	4	4	12	12	47	47	47			
10.3:																					
10.3.1:	11	13	28	33	33	36	44	48	49	50	50	50									
10.3.2:	12	20	43	48																	
10.3.3:	1	2	20	28	35	35	38	39	39	40	40	40	40	40	44	44	46	48	48	50	

Table 10.10 (continued)

Items Coded by Reviewers to Each Objective

West Virginia Grade 10 Science—November 2003

10.3.4:	33	33	33																																					
10.4:	2	5	8	10	13	14	14	14	14	16	16	16	17	17	17	18	20	20	20	21	21	21	22	22	22	22	22	23	23	24	26	26	32	32	33	36	41	43	46	49
10.4.1:	15	34	36	46																																				
10.4.2:	8	8	8	8	8	8	8	9	9	9	9	9	27	45	45	45	45	45	45	45	45																			
10.4.3:	9	9	13	13																																				
10.4.4:	9																																							
10.4.5:	29	29	37	37	37	37	37	37	37																															
10.4.6:	32	32	32	37																																				
10.4.7:	29	38	38	38	38	38	38	38	38																															
10.4.8:																																								
10.4.9:																																								
10.4.10:	7																																							
10.4.11:	22	22	22	26	26	26	36																																	
10.4.12:	31	36	36	41	41	41	41	41																																
10.4.13:	13	13	13	13																																				
10.4.14:	6	26	26	26	41	41																																		
10.4.15:																																								
10.4.16:																																								
10.4.17:	6	6	6	6	16	17	44																																	
10.4.18:	4	5	5	5	5	5	5	20	24	24																														
10.4.19:	14	21	40	40	40	40	40	40	40	40	44																													
10.4.20:	14	14	14	15	16	33	34	44	44	44	44	44	44																											
10.4.21:	25	25	25	25	25	25	25	39	39	39	39	39	39	39	39																									
10.4.22:	39																																							

Table 10.10 (continued)
Items Coded by Reviewers to Each Objective
West Virginia Grade 10 Science—November 2003

10.4.23:	28	28	28	28	28	28	28	43	43	43	43	43	50	50	50	50
10.4.24:	10	20	20	20												
10.4.25:	1	2	21	21	21	49	49	49	49	49	49					
10.4.26:	2															
10.4.27:	25															
10.4.28:	43															
10.4.29:	27															
10.4.30:	18	18	18	18	18	18	18	23	46	46	46	46	46	46		
10.4.31:	34	36	36	36	48	48	48	48	48	48						
10.4.32:																
10.4.33:	28															
10.4.34:	35	35	35	35	35	35										
10.4.35:																
10.4.36:	31	31	31	31	31	36										
10.4.37:																
10.4.38:	7	7	7	7	7	7	7	31								
10.4.39:	18	23	23	23	42	42	42	42	42	42	42	42				
10.4.40:																
10.5:	12	15	15	16	17											
10.5.1:																
10.5.2:	30	32														
10.5.3:	12	12	12	12	12	33	33									
10.5.4:																
10.6:	10	11	15	15	24	24										

Table 10.10 (continued)
Items Coded by Reviewers to Each Objective
West Virginia Grade 10 Science—November 2003

10.6.1:	11	11	36	36	36																
10.6.2:	10	10	10	10	11	11	24	24	24	30	30	30	30	32	34	34	34	34	34	34	34
10.6.3:	10	11	30																		
10.6.4:																					
10.6.5:	30	30																			

Table 10.11

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

West Virginia Grade 10 Science—November 2003

One Reviewer		50 % of Reviewers		All Reviewers
1		4		8

root:												
10.1:	15:1	19:1										
10.1.1:	23:1	34:1										
10.1.2:	15:1											
10.1.3:												
10.1.4:												
10.1.5:	19:2	29:6										
10.2:	2:4	3:3	5:1	16:1	17:1	19:1	50:1					
10.2.1:	15:1											
10.2.2:	4:3	19:3	47:2									
10.2.3:	6:1	11:1	12:1	32:1	47:1							
10.2.4:	6:1	27:6										
10.2.5:												
10.2.6:	20:1											
10.2.7:	1:2	2:1	3:4	6:1	31:1	43:1	47:3					
10.2.8:	1:7	3:1	4:5	12:2	47:3							
10.3:												
10.3.1:	11:1	13:1	28:1	33:2	36:1	44:1	48:1	49:1	50:3			
10.3.2:	12:1	20:1	43:1	48:1								
10.3.3:	1:1	2:1	20:1	28:1	35:2	38:1	39:2	40:5	44:2	46:1	48:2	50:1
10.3.4:	33:3											

Table 10.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 10 Science—November 2003

10.4:	2:1	5:1	8:1	10:1	13:1	14:4	16:3	17:3	18:1	20:3	21:3	22:5	23:2	24:1	26:2	32:2	33:1	36:1	41:1	43:1	46:1	49:1
10.4.1:	15:1	34:1	36:1	46:1																		
10.4.2:	8:7	9:5	27:1	45:8																		
10.4.3:	9:2	13:2																				
10.4.4:	9:1																					
10.4.5:	29:2	37:7																				
10.4.6:	32:3	37:1																				
10.4.7:	29:1	38:8																				
10.4.8:																						
10.4.9:																						
10.4.10:	7:1																					
10.4.11:	22:3	26:3	36:1																			
10.4.12:	31:1	36:2	41:5																			
10.4.13:	13:4																					
10.4.14:	6:1	26:3	41:2																			
10.4.15:																						
10.4.16:																						
10.4.17:	6:4	16:1	17:1	44:1																		
10.4.18:	4:1	5:6	20:1	24:2																		
10.4.19:	14:1	21:1	40:8	44:1																		
10.4.20:	14:3	15:1	16:1	33:1	34:1	44:6																
10.4.21:	25:7	39:8																				
10.4.22:	39:1																					
10.4.23:	28:7	43:5	50:4																			

Table 10.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 10 Science—November 2003

10.4.24:	10:1	20:3		
10.4.25:	1:1	2:1	21:3	49:6
10.4.26:	2:1			
10.4.27:	25:1			
10.4.28:	43:1			
10.4.29:	27:1			
10.4.30:	18:7	23:1	46:6	
10.4.31:	34:1	36:3	48:6	
10.4.32:				
10.4.33:	28:1			
10.4.34:	35:6			
10.4.35:				
10.4.36:	31:5	36:1		
10.4.37:				
10.4.38:	7:7	31:1		
10.4.39:	18:1	23:3	42:8	
10.4.40:				
10.5:	12:1	15:2	16:1	17:1
10.5.1:				
10.5.2:	30:1	32:1		
10.5.3:	12:5	33:2		
10.5.4:				
10.6:	10:1	11:1	15:2	24:2

Table 10.11 (continued)
Number of Reviewers Coding an Item by Objective (Item Number: Number of Reviewers)
West Virginia Grade 10 Science—November 2003

10.6.1:	11:2	36:3				
10.6.2:	10:4	11:2	24:3	30:4	32:1	34:7
10.6.3:	10:1	11:1	30:1			
10.6.4:						
10.6.5:	30:2					

Table 12
Science Objectives by Depth-of-Knowledge Level by Grade
West Virginia—November 2003

Grade 3		Grade 4		Grade 5		Grade 6		Grade 7		Grade 8		Grade 10	
OBJ	DOK	OBJ	DOK	OBJ	DOK	OBJ	DOK	OBJ	DOK	OBJ	DOK	OBJ	DOK
3.1.1	1	4.1.1	1	5.1.1	1	6.1.1	1	7.1.1	1	8.1.1	1	10.1.1	2
3.1.2	1	4.1.2	1	5.1.2	1	6.1.2	1	7.1.2	1	8.1.2	1	10.1.2	1
3.1.3	1	4.1.3	1	5.1.3	1	6.1.3	1	7.1.3	1	8.1.3	1	10.1.3	1
3.1.		4.1.		5.1.4	1	6.1.4	1	7.1.4	1	8.1.4	1	10.1.4	1
3.2.1	3	4.2.1	3	5.1.		6.1.		7.1.		8.1.		10.1.5	2
3.2.2	2	4.2.2	1	5.2.1	3	6.2.1	3	7.2.1	3	8.2.1	3	10.1.	
3.2.3	3	4.2.3	3	5.2.2	3	6.2.2	3	7.2.2	3	8.2.2	3	10.2.1	2
3.2.4	1	4.2.4	1	5.2.3	3	6.2.3	3	7.2.3	3	8.2.3	3	10.2.2	2
3.2.5	1	4.2.5	1	5.2.4	1	6.2.4	1	7.2.4	1	8.2.4	1	10.2.3	2
3.2.6	2	4.2.6	2	5.2.5	1	6.2.5	1	7.2.5	1	8.2.5	1	10.2.4	1
3.2.7	3	4.2.7	3	5.2.6	3	6.2.6	3	7.2.6	3	8.2.6	3	10.2.5	1
3.2.8	3	4.2.8	3	5.2.7	2	6.2.7	2	7.2.7	2	8.2.7	2	10.2.6	2
3.2.		4.2.9	3	5.2.8	3	6.2.8	3	7.2.8	2	8.2.8	2	10.2.7	2
3.3.1	1	4.2.10	2	5.2.		6.2.9	2	7.2.9	3	8.2.9	3	10.2.8	3
3.3.2	2	4.2.		5.3.1	2	6.2.		7.2.		8.2.		10.2.	
3.3.3	2	4.3.1	1	5.3.2	2	6.3.1	2	7.3.1	2	8.3.1	2	10.3.1	2
3.3.4	2	4.3.2	2	5.3.3	2	6.3.2	2	7.3.2	2	8.3.2	2	10.3.2	2
3.3.5	2	4.3.3	2	5.3.4	2	6.3.3	2	7.3.3	2	8.3.3	2	10.3.3	2
3.3.		4.3.4	2	5.3.		6.3.4	2	7.3.4	2	8.3.4	2	10.3.4	2
3.4.1	1	4.3.5	2	5.4.1	2	6.3.	2	7.3.		8.3.		10.3.	
3.4.2	2	4.3.		5.4.2	2	6.4.1	2	7.4.1	2	8.4.1	2	10.4.1	2
3.4.3	2	4.4.1	2	5.4.3	2	6.4.2	2	7.4.2	1	8.4.2	1	10.4.2	1
3.4.4	2	4.4.2	2	5.4.4	1	6.4.3	2	7.4.3	2	8.4.3	2	10.4.3	1
3.4.5	2	4.4.3	2	5.4.5	2	6.4.4	2	7.4.4	1	8.4.4	2	10.4.4	2
3.4.6	1	4.4.4	2	5.4.6	2	6.4.5	2	7.4.5	2	8.4.5	1	10.4.5	1
3.4.7	2	4.4.5	1	5.4.7	2	6.4.6	2	7.4.6	1	8.4.6	2	10.4.6	1
3.4.8	2	4.4.6	1	5.4.8	2	6.4.7	2	7.4.7	2	8.4.7	2	10.4.7	2
3.4.9	2	4.4.7	1	5.4.9	2	6.4.8	2	7.4.8	2	8.4.8	1	10.4.8	2
3.1.10	2	4.4.8	2	5.4.10	1	6.4.9	2	7.4.9	1	8.4.9	2	10.4.9	2
3.4.11	1	4.4.9	2	5.4.11	1	6.4.10	2	7.4.10	2	8.4.10	2	10.4.10	1
3.4.12	2	4.4.10	2	5.4.12	1	6.4.11	1	7.4.11	2	8.4.11	1	10.4.11	2
3.4.13	1	4.4.11	1	5.4.13	2	6.4.12	2	7.4.12	2	8.4.12	1	10.4.12	2
3.4.14	1	4.4.12	2	5.4.14	1	6.4.13	1	7.4.13	1	8.4.13	2	10.4.13	2
3.4.15	1	4.4.13	1	5.4.15	2	6.4.14	1	7.4.14	2	8.4.14	1	10.4.14	1
3.4.16	2	4.4.14	2	5.4.16	2	6.4.15	1	7.4.15	1	8.4.15	2	10.4.15	1
3.4.17	2	4.4.15	2	5.4.17	2	6.4.16	1	7.4.16	2	8.4.16	2	10.4.16	1
3.4.18	2	4.4.16	2	5.4.18	1	6.4.17	2	7.4.17	2	8.4.17	1	10.4.17	2
3.4.19	2	4.4.17	2	5.4.19	2	6.4.18	1	7.4.18	1	8.4.18	1	10.4.18	1
3.4.20	2	4.4.18	2	5.4.20	2	6.4.19	2	7.4.19	1	8.4.19	1	10.4.19	2
3.4.21	1	4.4.19	2	5.4.21	2	6.4.20	1	7.4.20	1	8.4.20	1	10.4.20	2
3.4.22	1	4.4.20	1	5.4.22	1	6.4.21	1	7.4.21	1	8.4.21	2	10.4.21	2
3.4.23	1	4.4.21	2	5.4.23	1	6.4.22	1	7.4.22	1	8.4.22	2	10.4.22	1
3.4.		4.4.22	2	5.4.24	2	6.4.23	2	7.4.23	2	8.4.23	2	10.4.23	2
3.5.1	1	4.4.23	2	5.4.25	1	6.4.24	2	7.4.24	1	8.4.24	2	10.4.24	2
3.5.2	3	4.4.24	2	5.4.		6.4.25	2	7.4.25	2	8.4.25	1	10.4.25	3
3.5.		4.4.25	1	5.5.1	2	6.4.26	2	7.4.26	1	8.4.26	1	10.4.26	2

Table 12 (continued)
Science Objectives by Depth-of-Knowledge Level by Grade
West Virginia—November 2003

Grade 3		Grade 4		Grade 5		Grade 6		Grade 7		Grade 8		Grade 10	
OBJ	DOK	OBJ	DOK	OBJ	DOK	OBJ	DOK	OBJ	DOK	OBJ	DOK	OBJ	DOK
3.6.1	2	4.4.26	1	5.5.2	3	6.4.27	2	7.4.27	2	8.4.27	1	10.4.27	2
3.6.2	3	4.4.27	2	5.5.		6.4.28	1	7.4.28	2	8.4.28	1	10.4.28	2
3.6.3	2	4.4.28	2	5.6.1	3	6.4.29	2	7.4.29	2	8.4.29	1	10.4.29	2
3.6.4	2	4.4.29	2	5.6.2	3	6.4.30	2	7.4.30	2	8.4.30	2	10.4.30	1
3.6.		4.4.30	1	5.6.3	3	6.4.		7.4.31	1	8.4.31	1	10.4.31	2
3.		4.4.31	1	5.6.4	2	6.5.1	3	7.4.32	2	8.4.32	2	10.4.32	1
		4.4.32	2	5.6.5	2	6.5.2	2	7.4.33	1	8.4.33	1	10.4.33	1
		4.4.33	1	5.6.		6.5.		7.4.		8.4.34	1	10.4.34	1
		4.4.34	2	5.		6.6.1	3	7.5.1	2	8.4.		10.4.35	2
		4.4.35	2			6.6.2	3	7.5.2	3	8.5.1	2	10.4.36	2
		4.4.				6.6.3	1	7.5.		8.5.2	2	10.4.37	2
		4.5.1	2			6.6.4	3	7.6.1	3	8.5.3	1	10.4.38	2
		4.5.2	3			6.6.5	2	7.6.2	3	8.5.4	3	10.4.39	1
		4.5.				6.6.	3	7.6.3	3	8.5.		10.4.40	2
		4.6.1	2			6.		7.6.4	2	8.6.1	3	10.4.	
		4.6.2	3					7.6.5	3	8.6.2	3	10.5.1	2
		4.6.3	2					7.6.		8.6.3	3	10.5.2	3
		4.6.4	2					7.		8.6.4	2	10.5.3	3
		4.6.								8.6.5	3	10.5.4	1
		4.								8.6.		10.5.	
										8.		10.6.1	2
												10.6.2	3
												10.6.3	3
												10.6.4	1
												10.6.5	3
												10.6.	
												10.	