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Is there a de facto national curriculum: evidence from state content standards?

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Systemic reform followed by standards based reform in K-12 education begins with state content standards. Based at least in part on policy research in education, the pair of reforms make the assumption that what is taught is a strong predictor of what students will learn. Thus, being clear about what it is that we want students to know and be able to do and expressing that message in content standards is the first step in standards based reform. Being clear as to the desired outputs of schooling, however, is hypothesized to be insufficient. To give weight to content standards the reforms call for student achievement testing aligned to the standards. The results of student achievement testing can be used in accountability in a variety of ways and to the extent the student achievement tests are aligned to the content standards, accountability should add to the influence of the contents standards on teachers' instructional practices and, ultimately student achievement.

An aligned education system can and has been extended to include aligned professional development and instructional materials. No Child Left Behind (NCLB) legislation, now up for re-authorization, puts standards based reform into law requiring, among other things, that each state publish grade specific challenging academic content standards in English, language arts and mathematics (grades 3-8 and at least one other grade in high school) and content standards in science in at least one grade level for elementary, middle and high school. NCLB also requires that states have aligned student achievement testing at the same grade levels and academic subjects and that they use the results to hold their schools accountable.

Some have suggested that voluntary national content standards would have advantages over state specific standards. They argue that math is math, reading is reading and science is science. They ask why does each state need to have their own standards for these subjects? If there were voluntary national content standards there could also be voluntary national achievement tests. The advocates for this approach hypothesize that the quality of standards and student achievement testing would increase dramatically, while the cost nation wide would plummet. (Porter, 2007). Of course, the United State is a country of states rights in education; those opposed to voluntary national content standards and voluntary national student achievement tests see both as infringements upon states' rights.

The purpose here is to investigate similarities and differences among states' content standards to examine the extent to which there already exists a de facto national curriculum, at least as represented by state content standards. The analysis includes state content standards in English, language arts and reading, mathematics and science. The focus is on grades K through 8. The investigation could have considered the alignment among state tests of student achievement or even investigated the alignment among different textbooks. Investigations of that type have been undertaken in the past (Freeman, et al., 1983; Freeman and Porter, 1989). Nevertheless, given the purpose of content standards in standards based reform and recognizing that content standards are published statements of what teachers are to teach and students are to learn, state content standards seem a good place to start in investigating the possibility of a de facto national curriculum. Further, if student achievement tests are truly aligned to state content standards, then what is found for the standards should apply to the achievement tests. Of course, regardless of standards teachers may all pretty much teach the same thing whether they are in Maine or California. The possibility of a de facto national curriculum as evidenced by teachers' instructional practices is an important question but beyond the scope of the work reported here. There has been one investigation of the similarities and differences across states of teacher's instructional practices in mathematics and the alignment among states in instructional practices was substantial (Porter, 2002).

A framework for thinking about standards based reform and how it might best be designed hypothesizes that standards based reform will be more influential on teachers' instructional practices and, ultimately, student learning to the extent that the policies making up standards based reform are (a) specific as to their message to teachers about what they are to teach (b) consistent (aligned) among themselves so that teachers receive a coherent message (c) having authority and (d) power. Policies can have authority to the extent they are developed and promoted by experts, are officially adopted by the state, are consistent with standard practice and are promoted by charismatic individuals. Policies have power to the extent that compliance with the policy is rewarded while failure to comply is sanctioned. Finally, (e) policies are more influential to the extent that they are kept in place over time (stability) (Schwille, 1983). To a considerable extent NCLB is consistent with this framework by calling for ambitious state content standards that are grade level specific, having student achievement tests aligned to the content standards and holding schools accountable for student performance on the achievement test. NCLB has now been in place for five years though its requirements have been phased in over time, with some of them not yet fully implemented (e.g., science).

The framework/theory for designing and implementing standards based reform suggests a second research question to guide the work: "how focused are the state content standards?" For example, do they represent a "less is more" mentality that stimulated some of the interest in standards based reform? From TIMSS Schmidt and colleagues reported the United States curriculum in mathematics and science as like the Missouri river, a mile wide and an inch deep. They strongly recommended greater focus on students mastering a few big ideas rather than getting exposure to a broad range of content.

A third question might ask "how demarcated is content across grade levels?" Are students expected to study and master new content at each grade level or is there considerable redundancy in what a student is taught and expected to learn from one grade level to the next? Porter (1989) investigated the redundancy in the content of mathematics instruction as delivered by teachers in elementary grades and found a slow moving curriculum with great redundancy from one grade to the next.

Addressing these three research questions will not necessarily shed light on what is best for students in the United States. Nevertheless, there is a reason to believe that students learn best what they are taught. (Gamoran, et al. 1997). Standards based reform is meant to influence what is taught and in that sense, what students learn. The strength of the effect may be a function of the five factors in the framework offered above. Whether or not the nature and range of content in the standards is what is best is an important question but, one that can only partially be addressed by the methods used here. For mathematics and science comparison of state content standards to national professional standards are possible, raising the question "to what extent are state content standards aligned to national professional standards?"

The Method

The content analysis procedures used here have their origins in the work of the Content Determinants group in the Institute for Research on Teaching at Michigan State University in the late 1970's to mid-1980s. That program of research investigated the factors influencing teachers' decisions about what to teach in elementary school mathematics. The hypothesis was that teachers' decision about what to teach are among the school controlled most influential influences on what students actually learn. The work pre-dated standards based reform by at least a decade.

The Content Determinants group developed a three dimensional language for describing what teachers might teach in elementary school mathematics. One dimension was specific mathematical topics, another was distinguished by computational procedures, memorization or application and a third dimension specified mode of presentation (e.g., text versus, pictures and graphs).

Over time, the content language for describing instructional practices in elementary school mathematics was modified and generalized. In an NSF funded project, "Reform Up Close", the language was generalized to science, the third dimension was dropped and the first two dimensions modified. The Council of Chief State School Officers, State Collaboratives on Assessment and Student Standards (SCASS/CCSSO) has used these content languages and extended them by developing a language for English, language arts and reading. To date, over thirty states have participated in the CCSSO/SCASS work using the languages to investigate their content standards, student achievement tests and instructional practices.

The content language for each subject divides specific topics into general areas. For example, in mathematics there are sixteen general areas (e.g., operations, measurement, basic algebra) and in each general area there are more specific topics ranging in number from 19 to 4. There are a total 217 specific topics. Crossed with topics the language has five levels of cognitive demand: memorize; perform procedures; demonstrate understanding; conjecture; generalize; prove; solve novel problems and make connections. (See appendix for definitions of cognitive demand) In English, language arts and reading there are 14 general areas of topics (e.g., phonemic awareness, fluency, comprehension). In each general area, there are as a few as 5 and as many as 16 specific topics for a total of 163 specific topics. The levels of cognitive demand are: memorize, perform procedures, generate, analyze, evaluate). In science, there are 28 general areas of content with from 4 to 12 specific topics within them for a total of 211 specific topics. The levels of cognitive demand are: memorize, perform procedures, communicate understanding, analyze information and apply concepts/make connections.

The content languages can be used to do analyses of content standards, assessments, curriculum materials and instructional practices. Here, the focus is on content analyses of content standards.

The task for a content analyst is to review a state's content standards in a particular subject at a particular grade level at the most specific level of statement found in the content standard document (often called objectives). For each objective, the analyst decides what intersection of specific topics by cognitive demand (cells) are represented. Because some objectives are inclusive as to content, the convention is to allow up to six cells to represent a single objective.

Before content analysis begins, content analysts are instructed in the content language with which they will be working. A sample set of state content standards is content analyzed individually by each analyst. The content standards and their content codes are then discussed by the analysts in order to establish an understanding of the content language and the task of content analysis.

Each content analyst then proceeds to work independently, one from the other, coding the content standards. Analysts are asked to flag any problems or confusions that they experience. Before the coding is completed the content analysts convene to discuss flagged items. Following discussion, the content analysts may or may not decide to change their initial coding. At the end of the procedure, each content analyst is asked to put down their best professional judgment on how to code each specific entry in the content standards document.

Each content standard is analyzed by 3 to 5 content analysts. The data for each analyst is put in the form of proportions with portions summing to 1 across the rows and columns of the topics by cognitive demand content taxonomy. Each specific statement about content in a content standard is weighted equally to each other. If a “content objective” is placed in six cells, each cell receives 1/6 of a point for that objective. In contrast, if the content analyst puts the objective in a single cell, that cell receives one point for that objective. The portions are calculated by dividing the total number of objectives in a content standard document into the frequency number in each cell. Once a topic by cognitive demand matrix of proportions has been determined for each content analyst, a cell by cell average is taken across content analyst to provide the content analysis as represented by the team of 3 to 5 analysts.

CCSSO/SCASS has in recent years convened content coding conferences where each of several states bring materials they want content analyzed to the conference. The conferences generally last from 2-3 days. If at the end of the conference all work is not completed, the content analysts complete the work on their own at home. The repository for data is the Wisconsin Center for Educational Research (WCER) at the University Of Wisconsin-Madison where John Smithson is the director. The data analyzed here are taken from that repository.

<u>The Data</u>

Thirty-one states have data in the WCER repository. For our purposes, states were selected for which their content standards had been content analyzed in English, language arts and reading, mathematics or science. The focus was on content standards in grades 4 and 8. In science, some states had content standards only at the fifth grade level and they were included. For English, language arts and mathematics, there are fourteen states; and for science, there were thirteen states. Additional analyses were done for states in which there were content analysis results for each grade 1-8. For states having results for every grade 1-8, there were 7 in English, language arts and reading, 10 in mathematics and 4 in science. All of the content analyses were completed since 2003. In mathematics and English, language arts content analyses were available for national professional standards and these results are included.

Quality of Content Analysis Data

Porter, et al. (in press) investigated the reliability of the content analyses procedures used by the CCSSO/SCASS. Using generalizability coefficients to estimate reliability, they investigated English and language arts and mathematics content standards in each of two states. For English and language arts and reading using three analysts, found reliabilities of .57 for Grade 3 and .78 for Grade 6 in one state and .76 for Grade 4 and .85 for Grade 6 in another state. For mathematics they found reliabilities of .83 for Grade 3 and .72 for Grade 6 in one state and .83 for Grade 4 and .74 for Grade 6 in the other state. The more analysts on which an average is taken the higher the generalizability coefficient. For the data analyzed here, there were always at least three content analysts and sometimes as many as five. The reliability of content analyses for state content standards in mathematics and English language arts are quite good. Porter (2002) reported generalizability coefficients for mathematics using the CCSSO/SCASS content analysis procedures of approximately the same magnitude.

Analyses

Once the basic data of cell proportions are in hand, an alignment index can be calculated to determine the extent to which one content standard has the same content message to teachers as another content standard (Porter 2002). The index is a function of the extent to which the proportions in the two dimensional matrix of topics by cognitive demand are, cell by cell, equal to each other. The index is defined as

$$\text{alignment index} = 1 - \frac{\Sigma | x - y |}{2}$$

where x denotes the cell proportions in one matrix and y denotes cell proportions in the other matrix. The index can take on values from 0 to 1.0 with 1.0, indicating perfect alignment. Alignment indices can be displayed in state by state matrices much like a correlation matrix. The off diagonal elements depict the alignment between one state's content standards and another state's content standards.

While the alignment index indicates the degree of alignment, content maps can be used to illustrate the nature of alignment. Here again the basic data are the topics by cognitive demand proportions. The content maps are generated using Excel software and can be thought of much like topographical maps where specific topics (the rows of the content matrix) can be thought of as north to south and cognitive demand (the columns of the content matrix) can be thought of as east to west. The software assumes that the topics and cognitive demand represent continuous variables but, in fact each is a nominal scale variable. Thus a content map which represents types of content emphasized in a state's content standard, while accurate at the intersection of the specific topic and cognitive demand, is not correct in the interpolations between those specific data points. Still, the content maps provide powerful images of what content is emphasized and what content is not within a state's content standards. By comparing the content map for one state's content standards to the content map of another state, one can readily see how the states' content standards are alike and how they are different. The content maps provide the "story" behind the alignment index.

The Results

State to State Alignment at 4th and 8th Grade

The first set of analyses show the alignment between one state's content standards in a particular subject and grade level and another state's content standards in that same subject at 4th grade level. Table 1 provides the results for English, language arts, Table 2 for science and Table 3 for mathematics. As can be seen, there is considerable variance in the degree of alignment across pairs of states both at 4th and 8th grades and in all three subjects. At least within a grade level, between state alignments are extremely low.

Table 4 shows the average between state alignments of content standards by subject and grade level. Maximum and minimum alignments are reported as well as average alignment with the NRC standards for science and NCTM standards for mathematics (there are no national professional standards in English, language arts and reading). Within grade level the average state to state alignments are in the .2's with a low of .20 at the 8th grade level for mathematics and the high of .27 for 4th grade mathematics. In science, the average state to national professional standards alignment is slightly higher than the average alignment among states, .30 at 4th grade and .28 at 8th grade. In mathematics, the alignment of state content standards to the NCTM standards is no greater than the alignment among states at both 4th and 8th grade levels. The alignment within state between grade level is higher than the alignment within grade level among states in all three subjects. For English, language arts and reading the difference is about .10. In mathematics however, the alignment within state between grades is no higher than the alignment among states within grade level, .22. The maximum alignments are substantially higher for each subject and grade level as might be expected and the minimum alignments are very low with none exceeding .15.

While the largest state to state alignments were substantial for each subject and grade level combination, they were no where near perfect alignment. Further, the average alignment between pairs of states was small. Maybe relatively modest alignment of state content standards is a function of requiring grade specific alignment. Perhaps the bulk of the differences in content standards among states come from their calling for the same content overall but at different grade levels. In order to explore this possibility, we identified all of the states in which their content standards had been analyzed at each grade level K-8 for English, language arts and reading and 1-8 for mathematics and science. Each grade level was weighted equally to create across grade level aggregate content standards. We analyzed the alignment of these aggregate standards (see Tables 5-7). As one might hypothesize, averages between state alignment of aggregate standards are substantially greater than was found for the grade specific standards: math .47, English, language arts and reading .53 but, for science only .33. Again, there was substantial between state variance in the degree of alignment for these aggregate standards. For ELAR, the maximum was .62 and the minimum .49; for science the maximum was .44 and the minimum .20 and for mathematics the maximum was .62 and the minimum .36. Even these alignments for aggregations across grade levels are no where near perfect. Further, the alignment of states with national professional standards for science (.37) and mathematics (.42) are no larger than the alignment among states.

What content is common and what content is unique among states?

So far we have explored the question of degree of alignment among state content standards and have seen that the average alignment is modest to low for each subject at each grade level and when aggregated across grade levels. Nevertheless, there is considerable variability among the values of the alignment index. Some states' standards are more aligned, one with the other than are others. Now we turn to the question of illustrating what content lies behind each particular alignment index. Because there are so many pairs of states, we decided to illustrate the content of the state content standards by selecting for each subject and grade level combination, the pair of states with the highest alignment and the pair of states with the lowest alignment. There is a pair of content maps for the coarse grain descriptions of content (i.e., general areas of content rather than specific topics within those general areas of content). We believe, however, that the real message lies with the fine grain analyses. Because there are so many fine grain analyses to consider, we selected just two content areas per subject. For English, language arts and reading we chose comprehension and writing. These content areas represent both reading and writing and were well represented across grades and states. For science, we selected ecology and earth science. These two content areas were among the most represented across states and grade levels and they best illustrate the difference among varying levels of alignment. For mathematics we selected number sense and basic algebra. We chose these content areas for their curricular importance and their representation across grades. Our basic data set includes fine grain content maps for every area of content for each of the three subjects at both of the grade levels. These are available in an interactive format where one can select for a particular subject and grade level any pair of states they wish to investigate.

English language arts and reading content maps. For English, language arts and reading at the 4th grade level the highest alignment of .48 was between Ohio and Indiana. The coarse grain pair of content maps is found in Figure 1. Both states emphasize students' abilities to explain comprehension, writing components, language study, and speaking and presenting.

In the area of reading comprehension (Fig. 2), Indiana places greater emphasis on analyzing narrative elements while Ohio places a greater emphasis on explaining narrative elements. For writing (Fig. 3), Indiana places a greater emphasis upon explaining word choice and generating support and elaboration and explaining writing conventions. In contrast, Ohio places a greater emphasis on explaining purpose, audience and context and organization.

The lowest degree of alignment between a pair of states for 4th grade English, language arts and reading was .09 for Idaho and Delaware. Figure 4 shows the coarse grain maps where Delaware places greater emphasis upon evaluation and Idaho puts a greater emphasis on generate. Delaware emphasizes critical reading and language study much more than Idaho. At the fine grain level for comprehension (Fig. 5), Delaware emphasizes explaining and generating descriptive elements but Idaho does not. In contrast, Idaho emphasizes narrative elements and expository or informational elements much more than Delaware. Delaware emphasizes electronic elements whereas Idaho does not. For writing (Fig. 6), Idaho's sole emphasis is on generate while Delaware puts a heavy emphasis on evaluate and to a lesser extent, explaining. Also, Idaho emphasizes main idea and support and elaboration but Delaware does not.

At the 8th grade level, the highest alignment was .48 between Minnesota and Oregon (Fig. 7). Both states tend to have a wide range of content and both emphasize generating writing components and analyzing critical reading and author's craft. At the fine grain level for comprehension (Fig. 8), Minnesota's content message is broad and inclusive while for Oregon the message is a bit more focused with a sharp emphasis on analyze narrative elements and analyze and explain strategies. For writing components (Fig. 9), in both states the emphasis is on generate but with Oregon putting a more pointed emphasis on main idea and support and elaboration than does Minnesota.

The lowest alignment was .07 between Maine and Wisconsin (Fig. 10). Wisconsin emphasizes writing, listening and speaking whereas Maine does not. In contrast, Maine puts a heavy emphasis upon comprehension and author's craft while Wisconsin does not. At the fine grain level for comprehension (Fig. 11), Maine's standards are sharply focused on explain, generate and analyze expository or informational elements, strategies and explaining and generating narrative elements. In contrast, Wisconsin has a much broader content focus and a relatively greater emphasis on analyze. Under writing (Fig. 12), again Maine is focused exclusively on support and elaborate with cognitive demands of explain, generate and analyze. In contrast, Wisconsin puts an emphasis on recall, generate and evaluate purpose, audience and context and a lesser emphasis upon support and elaborate.

There are substantial within state between grade level alignments. In English, language arts and reading the highest alignment was .56 for Minnesota. At the coarse grain level, the main difference between grade levels is an emphasis on generate at 4^{th} grade and analyze at 8^{th} grade (Fig. 13). The topics emphasized are very similar at the fine grain level for comprehension as are the levels of cognitive demand (Fig. 14). For writing (Fig. 15), Grade 4 is more focused on main ideas and organization and Grade 8 puts greater emphasis on style, voice and technique. For cognitive demand, generate is emphasized at the 4^{th} grade and is expanded to include evaluate at Grade 8.

The lowest alignment between Grade 4 and Grade 8 was .14 for Oklahoma. At the coarse grain level, at 4th grade there is heavy emphasis on writing components and language study but not at the 8th grade (Fig. 16). At Grade 8, there is heavy emphasis upon recall vocabulary and recall and explain comprehension. At the fine grain level for comprehension (Fig. 17), there is a much heavier emphasis in the 8th grade than in the 4th grade especially on recall and explain, word meaning from context, main ideas, expository or informational elements and strategies. For writing (Fig. 18), the emphasis is heavier at 4th grade than 8th grade with a strong emphasis on generate main ideas and organization. In contrast, for 8th grade there is little emphasis on writing and what emphasis there is focuses on explain and analyze purpose, audience, context and main idea.

Content maps for science. For Grade 4 science, the highest alignment was .41 between Colorado and Maine. Each puts heavy emphasis on the nature of science, ecology and astronomy (Fig. 19). In Colorado there is more emphasis on perform and in Maine there is more emphasis on communicate. At the fine grain level for earth systems (Fig. 20), Colorado emphasizes earth's shape but, Maine does not. The two states share an emphasis on mineral and rock formation and erosion and weathering. For ecology (Fig. 21), the similarities are more pronounced between the two states. Both emphasize communication about ecosystems and memorizing adaptation and variation. Maine emphasizes communicate about energy flow relationships much more than does Colorado.

The lowest alignment for 4th grade science was .04 between California and Ohio. California emphasizes memorization and performing while Ohio emphasizes communication (Fig. 22). Both emphasize the nature of science and ecology. Ohio puts more emphasis on astronomy than does California, while California puts more emphasis on earth systems than does

Ohio. California puts a heavy emphasis upon electricity but not Ohio. One caveat here is that Ohio standards are for Grade 5 while California standards are for Grade 4.

At the fine grain level for earth systems (Fig. 23), the maps illustrate that Ohio has almost no emphasis upon that content and what emphasis they have is about communication of earth's shape and earth's origins. California calls for content on the same two topic areas but, at the memorization level of cognitive demand. California calls for a great deal of work on mineral and rock formation and erosion and weathering and to a somewhat lesser extent the formation of volcanoes, earthquakes and mountains. For ecology at the fine grain level (Fig. 24), both states cover many of the same topics but again, California emphasis memorization whereas Ohio emphasizes communication and to some extent analyze.

At the 8^{th} grade level, the highest alignment is .40 between Indiana and Montana. These two states cover many of the same topics and at the same levels of cognitive demand although Montana emphasizes perform more than does Indiana and Indiana puts a greater emphasis on ecology, energy and motion than does Montana (Fig. 25). At the fine grain level, the two states were quite similar for earth systems (Fig. 26); both emphasizing communication about earth's shape, mineral and rock formations and plate techtonics. Indiana puts more emphasis upon dynamics and energy transfer than does Montana. For ecology (Fig. 27), there are more differences between the two states. Indiana emphasizes energy flow relationships while Montana emphasizes procedures having to do with biotic and abiotic factors. Indiana emphasizes adaptation and variation more than does Montana.

The lowest alignment at 8^{th} grade was .05 for California and Ohio. Here again, the big difference is in level of cognitive demand with California emphasizing memorization and Ohio emphasizing communication (Fig. 28). At the fine grain level, California includes nothing on earth systems while Ohio puts more emphasis on that content area (Fig. 29). In ecology, Ohio emphasizes adaptation and variation and California has nothing on ecology (Fig. 30).

For Montana, the content message of their science standards is quite similar between 4th and 8th grade with an alignment of .52. As seen in Figure 31, there is a heavy emphasis on performing and communicating about the nature of science. Evolution receives emphasis at both grade levels as does properties of matter and earth systems. At the fine grain level for earth systems (Fig. 32), the 4th grade emphasizes procedures and communication about earth's shape while at the 8th grade level, almost all of the emphasis is on communicating about earth's shape. Similarly, at 4th grade the emphasis is on procedures having to do with mineral and rock formations but by the 8th grade, the emphasis has shifted to communicating about mineral and rock formations. There is an emphasis upon oceanography at 8th grade but not at 4th grade. For ecology (Fig. 33), there is an emphasis on procedures and communicate biotic and abiotic factors but there is a much sharper emphasis at the 8th grade level on procedures.

For science the lowest alignment within a state between grades was .12 for California. The 4th grade puts a heavy emphasis on memorization about ecology and electricity while 8th grade does not cover either topic (Fig. 34). In contrast, 8th grade emphasizes motion and force, the properties of matter and astronomy while 4th grade does not. At the fine grain level for earth systems (Fig. 35), at the 4th grade the emphasis is on earth's shape, mineral and rock formations and the formation of volcanoes, earthquakes and mountains but there is no earth systems content at the 8th grade level. For ecology (Fig. 36) at 4th grade there is emphasis upon memorizing about food webs, competition and cooperation, energy flow relationships, ecosystems, adaptation and variation but, there is no ecology to be taught at the 8th grade level.

Content Maps for Mathematics. The highest between state alignment at Grade 4 in mathematics is .44 between New Hampshire and Vermont. At the coarse grain level, the two states emphasized many of the same topics although there is a tendency for New Hampshire to put a slightly greater emphasis upon demonstration and Vermont to put a slightly greater emphasis on procedures (Fig. 37). At the fine grain level for number sense the two states are quite similar (Fig. 38). Vermont puts an emphasis on ratio and proportion that is completely absent in New Hampshire but New Hampshire puts a stronger emphasis upon demonstration for whole numbers and integers. Both states emphasize estimation. For basic algebra (Fig. 39), both states emphasize demonstrate for evaluation of formulas, expressions and equations.

For 4th grade mathematics the two least aligned states are North Carolina and Wisconsin (.12). At the coarse grain level (Fig. 40), North Carolina puts a stronger emphasis upon number sense and operations while Wisconsin puts a larger emphasis on measurement all at the perform procedures level. Wisconsin puts a much stronger emphasis upon demonstrate basic algebra than does North Carolina. At the fine grain level in number sense (Fig. 41), North Carolina puts a much greater emphasis on a wider range of topics than does Wisconsin. Wisconsin puts a strong focus on content labeled “non-specific”. In contrast, North Carolina puts an emphasis on place value, ratio, proportion, real numbers, estimation, number comparisons, relationships between operations and “other”. For basic algebra (Fig. 42), Wisconsin has much greater emphasis than does North Carolina. Again, Wisconsin covers content “non-specific” and emphasizes demonstrate for patterns, linear and non-linear relations.

At the 8th grade level in mathematics, the states with the highest alignment are Delaware and Oregon (.33). At the coarse grain level (Fig. 43), the two states are seen to emphasize procedures for number sense, basic algebra and geometric concepts. The one contrast is a greater emphasis in Oregon on operations. At the fine grain level in number sense (Fig. 44), the main similarities are both states emphasize procedures for exponents, scientific notation. In addition, Oregon emphasizes procedures for ratio and proportion, order of operation and mathematical properties. For basic algebra (Fig. 45), both states emphasize procedures for evaluation of formulas, coordinate planes, multi-step equations, linear and non-linear relations and rate of change and slope. Oregon puts more emphasis on conjecture than does Delaware.

At the 8th grade level in mathematics, the two least aligned states are Oklahoma and Vermont (.06). At the coarse grain level (Fig. 46), the biggest difference between the two states is in cognitive demand. Oklahoma stresses memorize and Vermont stresses procedures. At the fine grain level in number sense (Fig. 47), again the biggest difference is level of cognitive demand with Oklahoma emphasizing memorization and Vermont emphasizing procedures. The exception is that Oklahoma emphasis conjecture for real/rational numbers. Vermont puts much more emphasis on percents than does Oklahoma. For basic algebra (Fig. 48), Oklahoma emphasis memorization of fewer topics while Vermont emphasizes procedures and demonstrate for a larger number of topics. The one exception to this is that Oklahoma emphasizes non-routine problems involving patterns.

For mathematics the greatest within state across subject alignment was .39 for New Hampshire. At the coarse grain level (Fig. 49), the content is quite similar between the two grades though 8th grade emphasizes conjecture for data display and 4th grade does not. Also, 4th grade emphasizes demonstrate for geometric concepts and 8th grade does not. At the fine grain level for number sense (Fig. 50), again there are more similarities than there are differences, though 8th grade puts a greater emphasis upon exponents and 4th grade upon demonstrate place value and whole numbers. For basic algebra (Fig. 51), demonstrate is the cognitive demand emphasized at both grade levels but 8th grade includes more basic algebra especially linear and non-linear relations and square roots and radicals.

The least alignment within state across grade levels for mathematics was .04 for Oklahoma. The main difference between grades is in level of cognitive demand with the greatest emphasis on procedures for 4th grade and the greatest emphasis upon memorization for 8th grade. At the fine grain level in number sense (Fig. 53), again the difference is mainly in terms of cognitive demand with procedures emphasized at the 4th grade level and memorization at the 8th grade level. In addition, the 4th grade called for instruction on computational algorithms and mathematical properties. In basic algebra (Fig. 54), patterns were emphasized at both grade levels but at 8th grade it was non-routine problems involving patterns. Also, 8th grade emphasized more topics including inequalities, linear and non-linear relations and rate of change not emphasized in 4th grade.

Content Maps for Standards Aggregated Across Grades. The highest alignment between a pair of standards for K-8 English, language arts and reading is .62 for California and Ohio. Both states aggregate content standards are broad and inclusive (Fig. 55). There is slightly more emphasis on comprehension and language in Ohio and greater emphasis on speaking and presenting in California. Ohio puts more emphasis on explain and California more on generate. At the fine grain level, the two states tend to emphasize the same topics but Ohio puts a greater emphasis upon strategies (Fig. 56). In writing (Fig. 57), the two states look quite similar but with a sharper focus on generate support and elaboration in California and on generate and analyze organization in Ohio.

The lowest degree of alignment for aggregate content standards across grades K-8 was between Indiana and Vermont, .44. Vermont puts a greater emphasis on generate, writing components, writing applications and on comprehension than does Indiana (Fig. 58). Indiana puts a greater emphasis on explain, comprehension and language study than does Vermont. At the fine grain level in comprehension, Indiana emphasizes explain and analyze narrative elements while Vermont emphasizes recall and, to some extent, explain narrative elements (Fig. 59). Vermont puts a heavy emphasis on generate electronic elements and strategies whereas Indiana puts relatively little emphasis on electronic elements and greater emphasis on explain strategies than does Vermont. For writing (Fig. 60), Vermont is sharply focused on generate purpose, audience, context; organization; support and style while Indiana puts less emphasis on writing. Virtually all of Indiana's emphasis is on the cognitive demands of explain and generate.

In science, the highest alignment for aggregate standards in grades 1-8 is .4 between Oklahoma and Delaware. Both states put a heavy emphasis on the nature of science but there is more emphasis on perform procedure for the nature of science in Oklahoma than in Delaware (Fig. 61). Delaware emphasizes biology and energy more than Oklahoma. Both states emphasize the properties of matter but Delaware puts a greater emphasis on analyze the properties of matter than does Oklahoma. At the fine grain level for ecology (Fig. 62), Oklahoma has a sharper focus on procedures for ecosystems than does Delaware while Delaware has a sharper focus on communicate adaptation and variation than does Oklahoma. For earth systems (Fig. 63), the two states have very similar content messages but Delaware has a slightly broader content message than does Oklahoma.

The lowest alignment for aggregate standards across grades 1-8 in science is between California and Indiana, .20. California puts a heavy emphasis on memorization (Fig. 64). In contrast, Indiana puts a heavier emphasis on communicate. Under nature of science, California stresses perform and Indiana communicate. California puts a heavier emphasis upon ecology

(Fig. 66) and earth systems (Fig. 65) than does Indiana. At the fine grain level, for ecology, California stresses memorization ecosystems, adaptation and variation and food webs while Indiana emphasizes communicate but does not emphasize ecosystems. For earth systems, again, California emphasizes memorization and Indiana, communicate. California also puts greater emphasis upon earth's origins and history than does Indiana while Indiana puts a bit more emphasis on oceanography than does California.

For mathematics, the highest alignment for aggregate standards in grades 1-8 is .62 between Oregon and Ohio. Both states emphasize procedures for number sense and measurement and Oregon emphasizes procedures for operations as well (Fig. 67). Both states emphasize procedures for basic algebra and geometric concepts. At the fine grain level for number sense (Fig. 68), the two states look very similar with the emphasis on procedures across most topics. One small difference is that Ohio puts a slightly greater emphasis upon the relationship between operations than does Oregon. For basic algebra (Fig. 69), the content message for Ohio is broader and more inclusive than is the content message for Oregon. Oregon has a sharper focus on procedures for coordinate plane than does Ohio.

The lowest aggregate across grade content standard alignment for mathematics is .35 between Oklahoma and New Hampshire. Both states emphasize number sense but Oklahoma emphasizes procedures while New Hampshire emphasizes demonstrate (Fig. 70). At the fine grain level under number sense (Fig. 71), both states emphasize estimation but Oklahoma emphasizes memorize and procedures while New Hampshire emphasizes procedures, demonstrate and conjecture. New Hampshire puts a greater emphasis on demonstrate fractions than does Oklahoma. For basic algebra (Fig. 72), New Hampshire focuses on demonstrate evaluation of formulas more than does Oklahoma and also on demonstrate rate of change.

How focused are state content standards?

Thus far, analyses have addressed questions of the extent to which there exist a de facto national curriculum as represented in state content standards for English, language arts, mathematics and science. The answer to this question is “no”, not at least to the extent to which states all have content standards at the same grade level with the same content message. Clearly, when one aggregates across grade levels (K-8 or Grade 1-8), the degree of alignment is substantially higher than for a specific grade level. Still, the alignment is no where near perfect and there continues to be variability among pairs of states in the degree to which their content standards are aligned. Some have argued that the United States K-8 curriculum is not sufficiently focused. They hypothesize that the greater content focus of some other countries explains their advantage in international assessment of student achievement. The hypothesis has received considerable play in the United States. Here we ask if the state content standards focus on a few important big ideas.

The data that allowed us to investigate the degree of alignment among states and their content standards also allow us to address the question of content focus. Three indices were created to investigate content focus: (a) the percent of all possible cells in a content language (taxonomy) for which there is at least some content emphasis no matter how little, (b) the percent of cells containing 1% or more of the total content and (c) the smallest percentage of cells required to represent at least 80% of a state’s intended curriculum. As shown in Table 8, 9 and 10, the first and third indices are highly correlated with correlations ranging from a low .93 for 8th grade mathematics to a high of .99 for 4th grade English, language arts and reading. The correlation between the first and second index varies considerably from -.52 for 4th grade English, language arts and reading to, .45 for Grade 4 science. The tables are arranged according to the third index, minimum percent of cells to capture at least 80% of the content. The most focused state is listed at the top of the table. As can be seen in the tables, the states vary dramatically in their extent of focus especially for English, language arts and reading. At the 4th grade level in English, language arts, Maine captures 80% of the intended curriculum with only 2.1% of the cells while Minnesota requires 14.1% of the cells to capture 80% of their curriculum. At the 8th grade level, the results are similar with Maine the most focused at 2.1% and Ohio the least focused at 17.2%. The results for math and science show a different pattern with all of the states more focused than the least focused in English, language arts and reading. In math, the most focused state at 4th grade is Oklahoma requiring 2.9% of the cells. In 8th grade, North Carolina is the most focused requiring just 2% of the cells. In contrast, the least focused state at 4th grade is Delaware requiring 7.3% of the cells and for 8th grade Kansas requiring 8.5% of the cells. The NCTM standards require a greater percentage of cells but that is not surprising since they are grade band standards spanning grades 3-5 and grade 6-8.

For science, the most focused state is California requiring 1.6% of the cells and the least focused is New Jersey requiring 6.9% of the cells. At 8th grade, California is again the most focused requiring 1.9% of the cells and Delaware the least focused requiring 7.4% of the cells. As was the case for mathematics, the national professional standards are understandably less focused because they represent grade bands for grades K-4 and grades 5-8.

Figure 73-90 compare and contrast the most focused and least focused states for each subject and at each grade level, first, at the coarse grain level and, second, for each of two specific content areas. In Fig. 73, 4th grade English, language arts standards are contrasted for Maine the most focused and Minnesota the least focused state. The contrast is striking, Maine focuses the bulk of its attention on explain and generate awareness of text and print features and comprehension. Within comprehension (Fig. 74), for Maine the emphasis is upon explain and generate narrative elements, expository or informational elements and strategies. In contrast, Minnesota's content standards in the area of comprehension call for a much broader and less focused coverage of content. The one main focus is on generate and analyze strategies as opposed to Maine's focus on explain and generate strategies. For writing (Fig. 75), Maine's focus again is on explain and generate organization and support and elaboration. In contrast, Minnesota has a much broader coverage of writing components content with a clear focus on generate organization.

At the 8th grade level, the most focused state is again, Maine as shown in Fig. 76. The heavy focus is on explain and generate comprehension and author's craft. Ohio is the least focused calling for coverage of almost all possible content. There is one focus on generating writing components. At the fine grain level within comprehension (Fig. 77), Maine focuses on explain, generate and analyze expository or informational elements and strategies, and on explain and generate narrative elements. Again, Ohio's coverage is much broader. For writing components (Fig. 78), Maine's exclusive focus is on support and elaboration. In contrast, Ohio covers all possible topics other than transitional devices with cognitive demands ranging across all five levels.

For science at 4th grade, the state with the most focused content standards is California and the state with the least focus is New Jersey (Fig. 79). New Jersey covers many more topics and complements its focus on memorization with emphasis given to communicate and analyze. At the fine grain level in earth systems (Fig. 80), California focuses on memorization of earth's shape, mineral and rock formations, erosion and weathering and the formation of volcanoes, earthquakes and mountains. In contrast, New Jersey puts some content emphasis on all possible topics except for dynamics and energy transfer and gives some attention for each topic to the four cognitive demands of memorize, procedures, communicate and analyze. There is a focus in New Jersey on memorizing earth's shapes, dimensions and compositions. At the fine grain level for ecology (Fig. 81), both California and New Jersey have fairly sharp focuses but California puts more emphasis on ecology with attention given to memorizing food webs, competition, energy flow, ecosystems, adaptation and variation. New Jersey focuses content on food webs, ecological succession and adaptation and variation with the greatest emphasis on memorize but some on analyze.

At the 8th grade level in science, the most focused state is again California and the least is Delaware (Fig. 82). California puts a great deal of emphasis on memorization for such topics as measurement in science, motion and force, properties of matter, astronomy, elements and for nature of science, perform and communicate. For Delaware, more topics are covered with a broader range of cognitive demands. At the fine grain level for earth systems (Fig. 83), California gives no emphasis while Delaware gives some coverage to six specific topics. For ecology, the same pattern applies (Fig. 84). California gives no coverage of ecology and Delaware gives a very broad comprehensive and unfocused coverage of ecology.

For mathematics at Grade 4, the most focused state is Oklahoma and the least focused is Delaware. Oklahoma puts its emphasis upon procedures of number sense, operations, measurement, basic algebra, geometric concepts, data displays and probability (Fig. 85). In contrast, Delaware covers essentially the same topics but gives attention to procedures, demonstrate and conjecture and, to some extent, non-routine problem solving. At the fine grain level in number sense (Fig. 86), again the coverage of specific topics is similar though Delaware covers factors/divisibility and Oklahoma does not. For the topics covered in each state, Oklahoma focuses primarily on procedures (with the exception of conjecture for patterns) while Delaware spreads its content emphasis across the cognitive demands of procedures, demonstrate and conjecture. For basic algebra (Fig. 87), Oklahoma focuses on procedures for one step equations and procedures, demonstration, conjecture and non-routine for patterns. In contrast, Delaware puts content emphasis on procedures for use of variables, coordinate patterns, linear/non-linear relations, rate of change and multiple representations and on conjecture for patterns, rate of change and multiple representations.

At the 8th grade level, the most focused state is North Carolina and the least is Kansas. At the coarse grain level, both state's content standards give attention to most of the content areas and, for each, several levels of cognitive demand (Fig. 88). Kansas includes probability and North Carolina does not but North Carolina includes trigonometry while Kansas does not. At the fine grain level for number sense (Fig. 89), the greater focus for North Carolina in contrast to Kansas is much easier to see. Kansas calls for instruction on procedures for place value, real and rational numbers, estimation and relations between operations. In contrast, Kansas gives at least some attention to fourteen specific topics and the full range of all five levels of cognitive demand. For basic algebra (Fig. 90), again the distinction and focus is less sharply drawn between the two states. Kansas gives attention to memorize, procedures, demonstrate, conjecture and non-routine for multiple representations. North Carolina does not call for instruction on multiple representations.

Is There a Core Curriculum Across States?

To examine the possibility of a core curriculum across states, the first step was constructing a state-by-cell matrix of proportions of content emphasis for grades 1-8 for science and mathematics and K-8 for ELAR. The mean and standard deviation of these proportions across states were calculated for each cell, and means greater than .01 were considered. These cells represent the content that accounts for greater than 1% the content standards in grades K-8 or 1-8 across states on average.

In ELAR there were eleven cells that had means across states greater than .01. These cells were Comprehension Strategies*Generate (mean=.017, standard deviation=.008), Writing Organization*Generate (.014, .004), Comprehension Strategies*Procedures (.013, .004), Public Speaking/Oral Presentation*Generate (.013, .009), Writing Support and Elaboration*Generate (.012, .006), Capitalization and Punctuation*Procedures (.012, .005), Writing Purpose/Audience/Context*Generate (.011, .008), Expository Writing*Generate (.011, .009), Pre-writing*Generate (.011, .008), Comprehension Strategies*Analyze (.010, .005), and Narrative Writing*Generate (.010, .005). Seven of the eight states include all of these cells in their standards; one state excludes Public Speaking*Generate. None of the eight states has more than two of these cells with proportions less than .005. The eleven cells represent between 10.5% and 18.1% of each state's total curriculum, with a mean value of 13.4%. Of the 11 topics, six were on writing and two on comprehension strategies. The cognitive demand was generate for eight of the eleven strategies. Comprehension strategies had cognitive demands of procedure, generate and analyze.

In mathematics there were thirteen cells with means across states greater than .01. These cells were Estimation*Procedures (.020, .009), Add/Subtract Whole Numbers*Procedures (.020*.009), Other*Demonstrate (.020, .038), Number Comparisons*Procedures (.015, .007), Time/Temperature*Procedures (.015, .008), Number Comparisons*Demonstrate (.014, .010), Summarize Data in a Table/Graph*Demonstrate (.013, .007), Summarize Data in a Table/Graph*Procedures (.012, .006), Simple Probability*Procedures (.012, .007), Whole Numbers*Procedures (.012, .007), Other*Solve Non-Routine Problems (.011, .016), Summarize Data in a Table/Graph*Conjecture/Generalize (.011, .011), and Add/Subtract Whole Numbers*Demonstrate (.010, .009). The "Other" cells represent where there is no appropriate content code in the content list. Except for the "Other" cells, nine of the ten states include all of these cells in their standards; one state excludes Number Comparisons*Demonstrate. The thirteen cells represent between 14.0% and 30.2% of each state's total curriculum, with a mean value of 18.6%. Of the thirteen topics, seven were procedure and four demonstrate; computation was a focus. Summarize data in a table/graph had cognitive demands of procedure, demonstrate and conjecture/generalize.

In science there were eight cells with means across states greater than .01. These cells were Nature of Scientific Inquiry/Method*Procedures (.054, .044), Nature of Scientific Inquiry/Method*Analyze Information (.028, .023), Science Tools/Lab Safety*Procedures (.020, .023), Nature of Scientific Inquiry/Method*Demonstrate Understanding (.020, .012), Scientific Habits of Mind/Logic/Reasoning*Analyze Information (.019, .026), Scientific Habits of Mind/Logic/Reasoning*Procedures (.012, .015), Data Displays*Procedures (.011, .012), and Scientific Habits of Mind/Logic/Reasoning* Demonstrate Understanding (.011, .014). No content from the traditional content areas (e.g., biology, chemistry, earth science, and physics) is included in these eight cells. All of these cells are represented in three of the four states; one state excludes Science Tools*Procedures. The eight cells represent between 15.3% and 35.9% of the content of each state's total curriculum, with a mean value of 21.7%. The first four cells alone represent between 9.9% and 23.3% of the curriculum across the four states.

Summary and Conclusions

Content analyses of state content standards in English, language arts and reading, science and mathematics in grades K-8 were used to address the following questions:

- Do state content standards support the conclusion that there is a de facto national curriculum in the United States?
- Are state content standards focused on a few big ideas?
- Do state content standards sharply differentiate content across grade levels?
- Are state content standards well aligned to national professional content standards?

The data come from state participation in Council of Chief State School Officers, State Collaboratives on Assessment in Student Standards. The states bring their content standards to content analysis conferences where they are content analyzed by trained content experts. The documents content analyzed are of the state's choosing. The reliability of the content analysis results has been investigated and been found to be reliable with reliabilities in the range of .7 to .85. There were fourteen states for English, language arts, reading and mathematics and thirteen for science. When analyses looked at the aggregate across grade levels, the numbers of states dropped to 10 in mathematics, 7 in English, language arts and reading and only 4 in science.

On the question of whether state content standards represent a de facto national curriculum, the answer is "no", but that is not to say that each state's content standards have content messages completely non-overlapping with which each other state's content standards. Some might say that it's a question of seeing the glass two thirds empty or one third full. Using an alignment index that ranges from 0 (no alignment) to 1.0 (perfect alignment), for each subject at the investigated grade levels of 4^{th} and 8^{th}, alignments were in the .20's. When content standards were aggregated across grade levels, between state alignment was stronger (as high as .53 for English, language arts and reading, .47 for mathematics but still only .33 for science). There was, however, considerable variability in degree of alignment across pairs of states, with alignment at the specific grade level for a subject ranging from as high as .56 to as low as .04. For aggregate standards the maximum alignment was .62 and the minimum .20. Clearly, the alignment among state content standards is no better than moderate for standards aggregated across grade levels and low when looking at a specific grade level. Graphical displays of the content emphasis of state content standards are used to tell the story behind the alignment indices for each subject and grade level as well as aggregate standards. Contrasts are made between the pair of most aligned states and the pair of least aligned states.

State's content standards are in general not focused on a few big ideas, but once again there is considerable variability from one state to the next and even from one subject to the next. Content standards are least focused for English, language arts and reading. For example, if one were to ask "what is the smallest subset of all possible content that might be taught that is required to capture 80% of the content emphasized in a state's content standards" for English, language arts and reading, 80% of one state's curriculum is captured in only 2% of all possible content while the least focused state requires 14% of all possible content that might be taught to capture 80% of its intended curriculum. For mathematics and science, the most focused states require 2% but the least focused require only 8.5% of all possible content that might be taught.

There is some evidence of a small core curriculum for each subject. On average, in English, language arts and reading of the 815 different types of content considered 11 had on average content emphasis in state content standards equal to or greater than 1%. For science, of the 1,085 different types of content there were 8 types of content with an emphasis equal to or greater than 1% on average. For mathematics, of the 1,055 different types of content there were 13 with an emphasis across states of 1% or greater. The 11 types of content for English, language arts and reading captured at least 10% of each state's curriculum and as high as 18%. For mathematics, the 13 cells captured from 14%-30% of each state's total curriculum and for science, the 8 types of content captured from 15%-36% of each state's intended curriculum.

The extent to which state content standards sharply differentiate content across grade levels again varies from state-to-state. For English, language arts and reading the within state alignment between 4th and 8th grade content standards was on average .35, .10 higher than the average between states within grade alignments. Nevertheless, the maximum Grade 4 to Grade 8 alignment was .56 while the minimum was only .14. For science, the average within state grade-to-grade alignment was .31, again .10 higher than the average within grade among state alignment. The maximum grade-to-grade alignment was .52 and the minimum .12. For mathematics, the pattern was slightly different with the between grade within state alignment on average no greater than the within grade among state alignment, .22. The maximum was .39 and the minimum .04. Again, graphic displays of the content message behind the alignment index values are provided. These graphic displays tell the story of what content remains constant across grade levels and what content changes from 4th to 8th grade. All these analyses show that there is some redundancy from 4th to 8th grade. Clearly, the amount of redundancy between adjacent grades would be substantially greater.

For mathematics and science, there are national professional content standards. In mathematics they are published by the National Council for Teachers of Mathematics and for science they are published by the National Research Council for the National Academies of Science. Many states say in the description of their standards that they have drawn heavily from the national professional content standards. These national professional standards in mathematics and science have been developed with input from a broad array of experts and are generally held to be of a high quality. They can be taken as authoritative statements of what students in the United States are to know and be able to do in each of those two subjects. In that sense, then the extent to which state content standards are aligned with the national professional content standards can be taken as evidence of the quality of the state content standards. Because the national professional standards are not grade level specific, the best analysis of alignment of state content standards to national professional standards is for standards aggregated across grade levels. For science, Indiana had the highest alignment with the national professional standards, .50, and the lowest alignment was for California, .22. In mathematics, the highest alignment was .54 for Delaware and the lowest was .35 for New Hampshire. The state alignments with national professional standards are no greater than they are for alignment among the states themselves.

Across all of the analyses then, the findings were (a) moderate to low alignment and (b) considerable variance among states. Of course, the degree of alignment is in part a function of how fine grain the distinctions in content are made. Obviously, if we had asked are all of the state mathematics content standards on mathematics, the answer would be "yes" (perfect alignment). Had we asked if they were aligned on cognitive demand alone, probably the alignment would have been higher. The same would have been true had we asked if standards are aligned on general content areas alone. Instead, we asked if standards are aligned at the intersection of specific topics and levels of cognitive demand. As has been stated, there are 1,085 distinct types of mathematical content, 1,055 distinct types of science content and 815 distinct types of English, language arts and reading content. The alignment investigated here was at the fine grain distinctions in types of content. Our rationale for looking at alignment at this fine grain level is twofold. First, in an investigation of the relationship between alignment between instructional content and tested content and gains in student achievement, alignment defined at the level of topics was not predictive of gains and neither was alignment at the level of cognitive demand. It was only when alignment was defined at the same fine grain level that alignment was able to predict gains in student achievement with correlations in the .45 range. Second, the content languages used here were developed over time with input from a wide variety of experts including and especially teachers. In fact, the languages were initially developed as tools to be used in studies of teachers' decisions about what content to teach to their students. The distinction and labels in the content languages come from that teacher input as well as content experts. Thus, the distinctions and labels at the fine grain level are distinctions teachers feel comfortable with in making decisions about what to teach.

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Table 1

State to State Alignment, 4th and 8th Grade ELAR Standards

	CA Stnds Gr.4	DE GLEs Gr.4	ID Stnds Gr.4	IN Stnds Gr.4	KS Stnds Gr.4	ME GLEs Gr.4	MN ELAR Stnds. Gr.4	MT R Stnds Gr.4	NH Reading GLEs Gr.4	OH Indctrs Gr.4	OK Stnds Gr.4	OR Stnds Gr.4	VT GLEs Gr.4	WI Stnds Gr.4
CA Stnds Gr.4 (2005)	1.00	0.14	0.26	0.40	0.12	0.11	0.38	0.23	0.09	0.30	0.43	0.33	0.31	0.32
DE GLEs Gr.4 (2006)	0.14	1.00	0.09	0.16	0.13	0.11	0.17	0.19	0.11	0.16	0.17	0.19	0.15	0.16
ID Stnds Gr.4 (2006)	0.26	0.09	1.00	0.28	0.13	0.11	0.30	0.14	0.15	0.22	0.31	0.29	0.27	0.26
IN Stnds Gr.4 (2007)	0.40	0.16	0.28	1.00	0.14	0.18	0.38	0.17	0.19	0.48	0.34	0.42	0.35	0.30
KS Stnds Gr.4 (2005)	0.12	0.13	0.13	0.14	1.00	0.21	0.19	0.30	0.24	0.14	0.20	0.22	0.18	0.13
ME GLEs Gr.4 (2005)	0.11	0.11	0.11	0.18	0.21	1.00	0.14	0.19	0.23	0.18	0.16	0.18	0.17	0.11
MN ELAR Stnds. Gr.4 (2005)	0.38	0.17	0.30	0.38	0.19	0.14	1.00	0.28	0.18	0.33	0.45	0.42	0.42	0.30
MT R Stnds Gr.4 (2005)	0.23	0.19	0.14	0.17	0.30	0.19	0.28	1.00	0.19	0.19	0.25	0.25	0.22	0.22
NH Reading GLEs Gr.4 (2005)	0.09	0.11	0.15	0.19	0.24	0.23	0.18	0.19	1.00	0.13	0.12	0.18	0.17	0.13
OH Indctrs Gr.4 (2007)	0.30	0.16	0.22	0.48	0.14	0.18	0.33	0.19	0.13	1.00	0.29	0.39	0.31	0.30
OK Stnds Gr.4 (2005)	0.43	0.17	0.31	0.34	0.20	0.16	0.45	0.25	0.12	0.29	1.00	0.37	0.34	0.32
OR Stnds Gr.4 (2007)	0.33	0.19	0.29	0.42	0.22	0.18	0.42	0.25	0.18	0.39	0.37	1.00	0.39	0.28
VT GLEs Gr.4 (2006)	0.31	0.15	0.27	0.35	0.18	0.17	0.42	0.22	0.17	0.31	0.34	0.39	1.00	0.27
WI Stnds Gr.4 (2003)	0.32	0.16	0.26	0.30	0.13	0.11	0.30	0.22	0.13	0.30	0.32	0.28	0.27	1.00
	CA Stnds Gr.8	DE GLEs Gr.8	ID Stnds Gr.8	IN Stnds Gr.8	KS Stnds Gr.8	ME GLEs Gr.8	MN ELAR Stnds. Gr.8	MT R Stnds Gr.8	NH Reading GLEs Gr.8	OH Indctrs Gr.8	OK Stnds Gr.8	OR Stnds Gr.8	VT GLEs Gr.8	WI Stnds Gr.8
CA Stnds Gr.8 (2005)	1.00	0.28	0.31	0.35	0.39	0.12	0.46	0.22	0.21	0.47	0.13	0.43	0.39	0.38
DE GLEs Gr.8 (2005)	0.28	1.00	0.26	0.25	0.24	0.24	0.30	0.32	0.26	0.23	0.15	0.29	0.27	0.18
ID Stnds Gr.8 (2006)	0.31	0.26	1.00	0.29	0.31	0.13	0.34	0.13	0.18	0.32	0.11	0.40	0.31	0.26
IN Stnds Gr.8 (2006)	0.35	0.25	0.29	1.00	0.29	0.09	0.34	0.15	0.17	0.28	0.12	0.34	0.28	0.24
KS Stnds Gr.8 (2003)	0.39	0.24	0.31	0.29	1.00	0.16	0.37	0.24	0.24	0.38	0.15	0.38	0.39	0.24
ME GLEs Gr.8 (2005)	0.12	0.24	0.13	0.09	0.16	1.00	0.12	0.24	0.24	0.10	0.15	0.18	0.13	0.07
MN ELAR Stnds. Gr.8 (2005)	0.46	0.30	0.34	0.34	0.37	0.12	1.00	0.23	0.29	0.47	0.23	0.48	0.41	0.32
MT R Stnds Gr.8 (2005)	0.22	0.32	0.13	0.15	0.24	0.24	0.23	1.00	0.23	0.18	0.19	0.20	0.19	0.15
NH Reading GLEs Gr.8 (2005)	0.21	0.26	0.18	0.17	0.24	0.24	0.29	0.23	1.00	0.20	0.22	0.24	0.22	0.10
OH Indctrs Gr.8 (2005)	0.47	0.23	0.32	0.28	0.38	0.10	0.47	0.18	0.20	1.00	0.12	0.40	0.38	0.33
OK Stnds Gr.8 (2007)	0.13	0.15	0.11	0.12	0.15	0.15	0.23	0.19	0.22	0.12	1.00	0.19	0.18	0.08
OR Stnds Gr.8 (2007)	0.43	0.29	0.40	0.34	0.38	0.18	0.48	0.20	0.24	0.40	0.19	1.00	0.43	0.30
VT GLEs Gr.8 (2006)	0.39	0.27	0.31	0.28	0.39	0.13	0.41	0.19	0.22	0.38	0.18	0.43	1.00	0.22
WI Stnds Gr.8 (2003)	0.38	0.18	0.26	0.24	0.24	0.07	0.32	0.15	0.10	0.33	0.08	0.30	0.22	1.00

Table 2

State to State Alignment, 4th and 8th Grade Science Standards

	CA Stnds Gr. 4	CO Stnds Gr. 4	DE GLEs Gr. 4	IN Stnds Gr. 4	ME Elem Stnds Gr. 4	MO GLEs Gr. 4	MT Stnds Gr. 4	NC Stnds Gr. 5	NJ Stnds Gr. 4	OH Stnds Gr. 5	OK Stnds Gr. 4	WI Stnds Gr. 4
CA Stnds Gr. 4	1.00	0.17	0.16	0.16	0.18	0.16	0.16	0.08	0.20	0.04	0.21	0.16
CO Stnds Gr. 4	0.17	1.00	0.20	0.25	0.41	0.16	0.32	0.20	0.31	0.22	0.19	0.33
DE GLEs Gr. 4	0.16	0.20	1.00	0.25	0.19	0.21	0.25	0.20	0.22	0.14	0.17	0.18
IN Stnds Gr. 4	0.16	0.25	0.25	1.00	0.22	0.20	0.32	0.21	0.23	0.23	0.22	0.31
ME Elem Stnds Gr. 4	0.18	0.41	0.19	0.22	1.00	0.18	0.29	0.17	0.24	0.20	0.28	0.37
MO GLEs Gr. 4	0.16	0.16	0.21	0.20	0.18	1.00	0.25	0.17	0.20	0.11	0.21	0.19
MT Stnds Gr. 4	0.16	0.32	0.25	0.32	0.29	0.25	1.00	0.19	0.29	0.24	0.20	0.33
NC Stnds Gr. 5	0.08	0.20	0.20	0.21	0.17	0.17	0.19	1.00	0.17	0.15	0.13	0.19
NJ Stnds Gr. 4	0.20	0.31	0.22	0.23	0.24	0.20	0.29	0.17	1.00	0.16	0.17	0.24
OH Indcts Gr. 5	0.04	0.22	0.14	0.23	0.20	0.11	0.24	0.15	0.16	1.00	0.10	0.21
OK Stnds Gr. 4	0.21	0.19	0.17	0.22	0.28	0.21	0.20	0.13	0.17	0.10	1.00	0.23
WI Stnds Gr. 4	0.16	0.33	0.18	0.31	0.37	0.19	0.33	0.19	0.24	0.21	0.23	1.00
	CA Stnds Gr. 8	**DE GLEs Gr. 8**	**FL Stnds Gr. 8**	**IN Sci Stnds Gr. 8**	**ME Inter Stnds Gr. 8**	**MO GLEs Gr. 8**	**MT Stnds Gr. 8**	**NC Stnds Gr. 8**	**NJ Stnds Gr. 8**	**OH Indctrs Gr. 8**	**OK Stnds Gr. 8**	**WI Stnds Gr. 8**
CA Stnds Gr. 8	1.00	0.08	0.16	0.09	0.26	0.09	0.08	0.15	0.21	0.05	0.13	0.12
DE GLEs Gr. 8	0.08	1.00	0.18	0.23	0.14	0.12	0.26	0.15	0.24	0.15	0.18	0.16
FL Stnds Gr. 8	0.16	0.18	1.00	0.17	0.27	0.11	0.17	0.11	0.23	0.15	0.09	0.14
IN Sci Stnds Gr. 8	0.09	0.23	0.17	1.00	0.18	0.22	0.40	0.22	0.30	0.24	0.34	0.25
ME Inter Stnds Gr. 8	0.26	0.14	0.27	0.18	1.00	0.16	0.19	0.30	0.33	0.13	0.24	0.31
MO GLEs Gr. 8	0.09	0.12	0.11	0.22	0.16	1.00	0.16	0.20	0.20	0.14	0.22	0.10
MT Stnds Gr. 8	0.08	0.26	0.17	0.40	0.19	0.16	1.00	0.26	0.31	0.20	0.36	0.31
NC Stnds Gr. 8	0.15	0.15	0.11	0.22	0.30	0.20	0.26	1.00	0.30	0.17	0.34	0.35
NJ Stnds Gr. 8	0.21	0.24	0.23	0.30	0.33	0.20	0.31	0.30	1.00	0.17	0.31	0.32
OH Indctrs Gr. 8	0.05	0.15	0.15	0.24	0.13	0.14	0.20	0.17	0.17	1.00	0.20	0.19
OK Stnds Gr. 8	0.13	0.18	0.09	0.34	0.24	0.22	0.36	0.34	0.31	0.20	1.00	0.32
WI Stnds Gr. 8	0.12	0.16	0.14	0.25	0.31	0.10	0.31	0.35	0.32	0.19	0.32	1.00

Table 3

State to State Alignment, 4th and 8th Grade Mathematics Standards

	DE GLEs Gr. 4	ID Stnds Gr. 4	IN Stnds Gr. 4	KS Stnds Gr. 4	MS Stnds Gr. 4	MT Stnds Gr. 4	NC Stnds Gr. 4	NH GLE Gr. 4	NJ Stnds Gr. 4	OH Indctrs Gr. 4	OK Stnds Gr. 4	OR Stnds Gr. 4	VT Stnds Gr. 4	WI Stnds Gr. 4
DE GLEs Gr. 4	1.00	0.27	0.34	0.27	0.33	0.26	0.30	0.29	0.25	0.32	0.30	0.29	0.33	0.21
ID Stnds Gr. 4	0.27	1.00	0.33	0.19	0.27	0.18	0.22	0.22	0.19	0.22	0.25	0.21	0.25	0.17
IN Stnds Gr. 4	0.34	0.33	1.00	0.29	0.37	0.26	0.34	0.26	0.27	0.29	0.35	0.39	0.30	0.19
KS Stnds Gr. 4	0.27	0.19	0.29	1.00	0.30	0.22	0.29	0.30	0.34	0.32	0.34	0.34	0.29	0.28
MS Stnds Gr. 4	0.33	0.27	0.37	0.30	1.00	0.14	0.23	0.23	0.33	0.33	0.39	0.42	0.29	0.25
MT Stnds Gr. 4	0.26	0.18	0.26	0.22	0.14	1.00	0.19	0.20	0.16	0.23	0.17	0.13	0.25	0.29
NC Stnds Gr. 4	0.30	0.22	0.34	0.29	0.23	0.19	1.00	0.27	0.20	0.31	0.40	0.27	0.23	0.12
NH GLE Gr. 4	0.29	0.22	0.26	0.30	0.23	0.20	0.27	1.00	0.20	0.30	0.24	0.22	0.44	0.21
NJ Stnds Gr. 4	0.25	0.19	0.27	0.34	0.33	0.16	0.20	0.20	1.00	0.30	0.22	0.29	0.20	0.30
OH Indctrs Gr. 4	0.32	0.22	0.29	0.32	0.33	0.23	0.31	0.30	0.30	1.00	0.40	0.39	0.35	0.33
OK Stnds Gr. 4	0.30	0.25	0.35	0.34	0.39	0.17	0.40	0.24	0.22	0.40	1.00	0.39	0.27	0.19
OR Stnds Gr. 4	0.29	0.21	0.39	0.34	0.42	0.13	0.27	0.22	0.29	0.39	0.39	1.00	0.27	0.25
VT Stnds Gr. 4	0.33	0.25	0.30	0.29	0.29	0.25	0.23	0.44	0.20	0.35	0.27	0.27	1.00	0.22
WI Stnds Gr. 4	0.21	0.17	0.19	0.28	0.25	0.29	0.12	0.21	0.30	0.33	0.19	0.25	0.22	1.00

	DE GLEs Gr. 8	ID Stnds Gr. 8	IN Stnds Gr. 8	KS Stnds Gr. 8	MS Stnds Gr. 8	MT Stnds Gr. 8	NC Stnds Gr. 8	NH GLE Gr. 8	NJ Stnds Gr. 8	OH Indctrs Gr. 8	OK Stnds (b) Gr. 8	OR Stnds Gr. 8	VT Stnds Gr. 8	WI Stnds Gr. 8
DE GLEs Gr. 8	1.00	0.29	0.18	0.30	0.21	0.26	0.16	0.22	0.22	0.22	0.16	0.33	0.23	0.21
ID Stnds Gr. 8	0.29	1.00	0.19	0.31	0.31	0.28	0.13	0.21	0.25	0.18	0.14	0.27	0.24	0.27
IN Stnds Gr. 8	0.18	0.19	1.00	0.19	0.20	0.13	0.14	0.16	0.45	0.19	0.10	0.24	0.17	0.20
KS Stnds Gr. 8	0.30	0.31	0.19	1.00	0.25	0.27	0.21	0.29	0.25	0.19	0.11	0.32	0.27	0.22
MS Stnds Gr. 8	0.21	0.31	0.20	0.25	1.00	0.18	0.17	0.23	0.24	0.21	0.18	0.33	0.17	0.19
MT Stnds Gr. 8	0.26	0.28	0.13	0.27	0.18	1.00	0.11	0.16	0.19	0.14	0.08	0.19	0.25	0.18
NC Stnds Gr. 8	0.16	0.13	0.14	0.21	0.17	0.11	1.00	0.17	0.14	0.16	0.16	0.27	0.15	0.15
NH GLE Gr. 8	0.22	0.21	0.16	0.29	0.23	0.16	0.17	1.00	0.20	0.11	0.09	0.21	0.28	0.14
NJ Stnds Gr. 8	0.22	0.25	0.25	0.25	0.24	0.19	0.14	0.20	1.00	0.18	0.07	0.25	0.24	0.30
OH Indctrs Gr. 8	0.22	0.18	0.19	0.19	0.21	0.14	0.16	0.11	0.18	1.00	0.14	0.23	0.16	0.14
OK Stnds (b) Gr. 8	0.16	0.14	0.10	0.11	0.18	0.08	0.16	0.09	0.07	0.14	1.00	0.20	0.06	0.08
OR Stnds Gr. 8	0.33	0.27	0.24	0.32	0.33	0.19	0.27	0.21	0.25	0.23	0.20	1.00	0.30	0.21
VT Stnds Gr. 8	0.23	0.24	0.17	0.27	0.17	0.25	0.15	0.28	0.24	0.16	0.06	0.30	1.00	0.22
WI Stnds Gr. 8	0.21	0.27	0.20	0.22	0.19	0.18	0.15	0.14	0.30	0.14	0.08	0.21	0.22	1.00

Table 4

Average Alignment, Maximums, and Minimums among State Content Standards and National Professional Standards

		Gr. 4	Gr. 8	National Professional
	ELAR			
Average	Gr. 4	0.24		
	Gr. 8	0.35	0.25	
Max	Gr. 4	0.48		
	Gr. 8	0.56	0.48	
Min	Gr. 4	0.09		
	Gr. 8	0.14	0.07	
	Science			
Average	Gr. 4	0.21		0.3
	Gr. 8	0.31	0.21	0.28
Max	Gr. 4	0.41		0.49
	Gr. 8	0.52	0.4	0.46
Min	Gr. 4	0.04		0.15
	Gr. 8	0.12	0.05	0.07
	Mathematics			
Average	Gr. 4	0.27		0.25
	Gr. 8	0.22	0.2	0.19
Max	Gr. 4	0.44		0.39
	Gr. 8	0.39	0.33	0.28
Min	Gr. 4	0.12		0.07
	Gr. 8	0.04	0.06	0.06

Table 5

Alignment among States on Grades K-8 ELAR Standards

	CA Stnds Gr.K-8	ID Stnds Gr.K-8	IN Stnds Gr.K-8	MN Stnds Gr.K-8	OH Stnds Gr.K-8	OR Stnds Gr.K-8	VT Stnds Gr.K-8
CA Stnds Gr.K-8	1.00	0.51	0.53	0.59	0.62	0.53	0.46
ID Stnds Gr.K-8	0.51	1.00	0.54	0.54	0.54	0.61	0.48
IN Stnds Gr.K-8	0.53	0.54	1.00	0.49	0.58	0.51	0.44
MN Stnds Gr.K-8	0.59	0.54	0.49	1.00	0.62	0.57	0.50
OH Stnds Gr.K-8	0.62	0.54	0.58	0.62	1.00	0.53	0.46
OR Stnds Gr.K-8	0.53	0.61	0.51	0.57	0.53	1.00	0.50
VT Stnds Gr.K-8	0.46	0.48	0.44	0.50	0.46	0.50	1.00

Table 6

Alignment among States, NSE on Grades 1-8 Science Standards

	CA Stnds Gr. 1-8	DE Stnds Gr. 1-8	IN Stnds Gr. 1-8	OK Stnds Gr. 1-8	NSE Stnds Gr. K-8
CA Stnds Gr. 1-8	1.00	0.25	0.20	0.27	0.22
DE Stnds Gr. 1-8	0.25	1.00	0.40	0.44	0.39
IN Stnds Gr. 1-8	0.20	0.40	1.00	0.41	0.50
OK Stnds Gr. 1-8	0.27	0.44	0.41	1.00	0.38
NSE Stnds Gr. K-8	0.22	0.39	0.50	0.38	1.00

Table 7

Alignment among States, NCTM on Grades 1-8 Mathematics Standards

	DE GLEs Gr.1-8	ID Stnds Gr. 1-8	IN Stnds Gr. 1-8	KS Stnds Gr. 1-8	MN Stnds Gr. 1-8	NH Stnds Gr. 1-8	OH Stnds Gr. 1-8	OK Stnds Gr. 1-8	OR Stnds Gr. 1-8	VT Stnds Gr. 1-8	NCTM Stnds Gr. K-8
DE GLEs Gr.1-8	1.00	0.49	0.50	0.54	0.50	0.41	0.56	0.48	0.55	0.53	0.54
ID Stnds Gr. 1-8	0.49	1.00	0.46	0.49	0.40	0.40	0.46	0.42	0.48	0.43	0.39
IN Stnds Gr. 1-8	0.50	0.46	1.00	0.51	0.40	0.40	0.52	0.47	0.56	0.46	0.43
KS Stnds Gr. 1-8	0.54	0.49	0.51	1.00	0.39	0.48	0.57	0.45	0.58	0.49	0.41
MN Stnds Gr. 1-8	0.50	0.40	0.40	0.39	1.00	0.39	0.44	0.37	0.43	0.39	0.38
NH Stnds Gr. 1-8	0.41	0.40	0.40	0.48	0.39	1.00	0.46	0.36	0.45	0.53	0.35
OH Stnds Gr. 1-8	0.56	0.46	0.52	0.57	0.44	0.46	1.00	0.46	0.62	0.53	0.41
OK Stnds Gr. 1-8	0.48	0.42	0.47	0.45	0.37	0.36	0.46	1.00	0.48	0.40	0.45
OR Stnds Gr. 1-8	0.55	0.48	0.56	0.58	0.43	0.45	0.62	0.48	1.00	0.51	0.38
VT Stnds Gr. 1-8	0.53	0.43	0.46	0.49	0.39	0.53	0.53	0.40	0.51	1.00	0.49
NCTM Stnds Gr. K-8	0.54	0.39	0.43	0.41	0.38	0.35	0.41	0.45	0.38	0.49	1.00

Table 8

Three Indices of Content Focus of ELAR Standards, Percent of Total Possible Cells,
Grades 4 and 8

	Any content (X)	1% or greater (Y)	80% of the curriculum (Z)
ME GLEs Gr.4	5.4%	3.1%	2.1%
NH Reading GLEs Gr.4	5.6%	4.0%	2.9%
KS Stnds Gr.4	8.1%	4.7%	4.0%
DE GLEs Gr.4	17.5%	4.0%	6.1%
ID Stnds Gr.4	13.4%	4.8%	6.1%
MT R Stnds Gr.4	19.0%	3.6%	7.0%
VT GLEs Gr.4	19.8%	3.8%	7.7%
WI Stnds Gr.4	17.8%	4.5%	7.9%
OR Stnds Gr.4	22.3%	4.0%	9.3%
IN Stnds Gr.4	22.0%	2.9%	9.3%
OH Indctrs Gr.4	23.9%	3.3%	10.1%
CA Stnds Gr.4	26.5%	2.7%	11.2%
OK Stnds Gr.4	28.2%	3.2%	12.6%
MN ELAR Stnds. Gr.4	33.4%	2.8%	14.1%
	Correlation (Pearson's r) of Y and Z		-0.52
	Correlation (Pearson's r) of X and Z		0.99
	Any content (F)	**1% or greater (G)**	**80% of the curriculum (H)**
ME GLEs Gr.8	5.5%	2.9%	2.1%
OK Stnds Gr.8	12.9%	3.2%	4.4%
NH Reading GLEs Gr.8	10.2%	3.1%	4.5%
DE GLEs Gr.8	15.8%	4.3%	5.4%
MT R Stnds Gr.8	16.1%	3.9%	5.6%
KS Stnds Gr.8	16.9%	4.2%	6.1%
IN Stnds Gr.8	21.3%	3.6%	8.0%
ID Stnds Gr.8	19.8%	4.5%	8.1%
OR Stnds Gr.8	22.1%	4.9%	8.6%
VT GLEs Gr.8	22.8%	3.3%	9.6%
WI Stnds Gr.8	26.6%	3.2%	10.9%
CA Stnds Gr.8	31.9%	2.7%	13.7%
MN ELAR Stnds. Gr.8	30.7%	3.1%	14.5%
OH Indctrs Gr.8	35.5%	2.2%	17.2%
	Correlation (Pearson's r) of G and H		-0.42
	Correlation (Pearson's r) of F and H		0.98

Table 9

Three Indices of Content Focus of Science Standards, Percent of Total Possible Cells, Grades 4 and 8

	Any content (X)	1% or greater (Y)	80% of the curriculum (Z)
CA Stnds Gr. 4	5.3%	1.8%	1.6%
OK Stnds Gr. 4	4.5%	1.9%	1.6%
WI Stnds Gr. 4	6.3%	2.8%	2.7%
OH Stnds Gr. 5	8.6%	2.7%	2.7%
ME Elem Stnds Gr. 4	7.9%	2.6%	3.0%
CO Stnds Gr. 4	10.4%	2.8%	3.8%
NC Stnds Gr. 5	9.9%	2.9%	3.8%
MO GLEs Gr. 4	10.2%	2.2%	4.0%
IN Stnds Gr. 4	9.2%	2.7%	4.3%
DE GLEs Gr. 4	13.8%	3.1%	5.5%
MT Stnds Gr. 4	16.1%	2.7%	5.8%
NJ Stnds Gr. 4	17.3%	2.7%	6.9%
NSE Gr. K-4	23.3%	2.5%	7.2%
	Correlation (Pearson's r) of Y and Z		0.46
	Correlation (Pearson's r) of X and Z		0.96
	Any content (F)	**1% or greater (G)**	**80% of the curriculum (H)**
CA Stnds Gr. 8	6.4%	2.5%	1.9%
WI Stnds Gr. 8	7.4%	2.8%	2.1%
OH Indctrs Gr. 8	7.0%	3.8%	3.2%
OK Stnds Gr. 8	9.5%	2.0%	3.3%
NJ Stnds Gr. 8	9.1%	2.9%	4.3%
MO GLEs Gr. 8	10.0%	2.2%	4.4%
ME Inter Stnds Gr. 8	12.0%	2.6%	4.4%
FL Stnds Gr. 8	10.0%	3.7%	5.0%
NC Stnds Gr. 8	17.0%	2.7%	5.4%
IN Sci Stnds Gr. 8	16.5%	2.0%	5.5%
MT Stnds Gr. 8	19.1%	2.9%	7.2%
DE GLEs Gr. 8	19.3%	2.6%	7.4%
NSE Gr. 5-8	19.3%	2.4%	7.4%
	Correlation (Pearson's r) of G and H		-0.08
	Correlation (Pearson's r) of F and H		0.94

Table 10

Three Indices of Content Focus of Mathematics Standards, Percent of Total Possible Cells, Grades 4 and 8